Fondazione Eni Enrico Mattei

How Does Trade Sale Privatization Work?
Evidence from the Fixed-Line Telecommunications Sector in Developing Economies

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NOTA DI LAVORO 79.2002

SEPTEMBER 2002

PRIV – Privatisation, Regulation, Antitrust

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Summary

This research examines the effects of privatization transaction strategy on enterprise performance in developing economies. Focusing on trade sale privatization, we use an event-driven data strategy and time-series regression techniques on data covering fixed-line telecommunications operators between 1980 and 1998. The results show performance benefits are realized when privatization trade sales introduce large-block foreign shareholdings and hybrid forms of governance, such as joint ventures or consortia. These hybrid governance structures capture more complex ownership effects during privatization restructuring, particularly when compared with the dispersed shareholdings of share issue privatization, which show no discernable effect on performance. We argue traditional financial models are too focused on large-scale market-driven mechanisms at the expense of institution-building mechanisms, and as such fail to capture important contributors to performance improvement. We advance a comparative institutional lens to better understand how "firms effects" matter for privatization restructuring and performance.

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INTRODUCTION

The impact of privatization on performance is both a central policy issue in many countries and an emerging line of inquiry in financial economics. The most recent debate has focused on the failure both of privatization policy to produce the economic outcomes initially predicted and empirical research to produce consistent results on privatization performance.

A consensus of sorts is forming among privatization practitioners that lack of positive outcomes in certain developing economies may be due to an over reliance on large-scale market-driven mechanisms at the expense of institution-building for governing firm-led restructuring (Nellis, 1999). At the same time, privatization research has turned its attention to the role of the controlling shareholder in explaining privatization performance. Evidence from transition economies in particular suggest that such large-block shareholders are not homogenous, that certain types of owners have a disproportionately large impact on corporate governance for influencing post-privatization restructuring and improving performance in newly privatized firms (see, Djankov (1999) and Claessens (1997), for instance).

Despite the dramatic rise in privatization initiatives in the past two decades (Kikeri, Nellis & Shirley, 1994) and the potential significance of these events in the restructuring of formerly state-owned enterprise, the privatization performance relationship has not figured highly on the research agenda of management scholars in general (De Castro, 1997a).

Yet contributions are being made to improve research in privatization by certain strategy and organization scholars interested in corporate governance. Key insights from this literature suggest the mismatch between privatization policy and outcome to rest with inappropriate theory (Spicer, McDermott & Kogut, 2000) and mixed results in the empirical literature on privatization performance to lie with unsuitable research design (Villalonga, 2000), as well as incomplete conceptual modeling and underdefinition of the privatization construct itself (Zahra, Ireland, Gutierrez & Hitt, 2000).

Discourse for these scholars centers on *how privatization can be implemented successfully*. Specifically, how much privatization affects restructuring and what organizational dynamics are involved (Villalonga, 2000) or how new owners actually carry out the restructuring process and which owners are best suited for this (Spicer et al, 2000); and how privatization strategies and

their unique characteristics may impact this process and performance differently (Zahra et al, 2000).

Our research joins the ongoing debate; importantly, we ask two fundamental research questions: 1) Do ownership effects matter? 2) Do firm effects matter, can some firms, by virtue of their privatization strategy and other organizational attributes attain superior post privatization performance? These questions lie at the heart of discourse that continues in financial economics and has just begun in strategy and organization yet which holds promise for bridging both along related lines of inquiry in research on corporate governance.

We advance a microanalytic perspective from a contractual view of economic organization to shed some light on these questions. Our perspective extends the traditional agency theory approach to include a transaction costs economics (TCE) and networks-for-learning approach. We use this comparative institutional lens to introduce 'hybrid governance form' as a meso-level organizational implication of trade sale privatization strategy in order to capture more complex blockholder effects in privatization implementation. Privatization may be defined as the partial or full transfer of an equity stake in a state-owned enterprise, to the private sector by the sale of ongoing concerns. Trade sale privatization is identified when this transfer of equity is to another firm or group of (corporate) investors, while hybrid governance recognizes inter-organizational structures such as joint ventures, strategic alliances, business groups, consortia arrangements, and networks of firms more generally.

Our basic proposition is that the transaction-specific characteristics of privatization strategies differ in their ability to 1) consolidate blockholder positions for incentivizing restructuring and 2) configure blockholder governance for safeguarding restructuring. The strategy and economic organization literature identify two conditions under which hybrids offer an advantage in safeguarding exchange relationships: when transacting under conditions of asset specificity and when governing inter-firm knowledge transfer. We argue that trade sale privatization strategies which introduce hybrid structures offer an efficient governance form when moderate asset specificity is assumed present for at least one of the transaction parties and an effective governance form when inter-firm transfer of proprietary technology or know-how is presumed important for post-privatization restructuring. Our core thesis, then, is that "firm" effects do matter. Our novel hypothesis, that privatization strategy characterized by hybrid governance safeguards restructuring and will improve performance.

In the next section, we provide a brief overview of the relevant literature develop the hypotheses. We then discuss the study's research design, followed by the empirical findings. A concluding section discusses the findings and highlights potential avenues for future work.

EPIRICAL LITERATURE

Two common privatization strategies are recognized (Megginson, Nash, Netter, & Poulsen, 2000): trade sale privatization, as described above and share issue privatization (Jones, Megginson, Nash, and Netter, 1999), the transfer of equity through a public offering. A third strategy, limited to certain transition economies, is voucher privatization, the transfer of equity in the form of exchangeable vouchers, distributed to citizens, and convertible into shares in state-owned enterprise. As a process, privatization often occurs incrementally, in a series of transactions over time. Such is the case with divestiture through multiple public offerings or with mixed sales, a combination trade sale and follow on share issue(s). Though privatization is now a global phenomenon (Megginson & Netter, 1998; Kikeri, Nellis & Shirley, 1994; Ramamurti 1992), there are important differences in the way privatization is implemented in developed and developing economies.[1] According to Organization for Economic Cooperation and Development (OECD) figures, throughout the 1990s, share issue transactions were the dominant strategy in developed economies. In marked contrast, trade sale privatization continued to be the main transaction strategy in developing economies, with certain administrations adopting mixed transactions. Foreign direct investment characterized privatization in these economies as well.

Privatization event effects

Despite the importance of trade sale privatization strategies for developing economies, sample selection has relied on public offerings in developed economies for studying privatization effects. The Megginson programme (Megginson, Nash, & Van Randenborgh, 1994; D'Souza & Megginson, 1999) is restricted to share issue privatization by design as selection criteria dictates extensive, publicly available firm-level performance data on a larger multi-industry and multi-

[1] The term developing economies is used inclusively, and refers to economies specified as emerging or transitional (i.e. in Asia and Central Europe, for instance) as well. Likewise we consider non-OECD countries as developing and OECD countries as developed.

national sample[2] and developed economy observations by chance as these same requirements place certain data constraints in obtaining an adequate number of reliable developing economy observations. Trade sale privatization is not examined, for instance, as the privatized firm may no longer remain independent and comparable *ex post* firm-level performance data may not exist. Yet, rigorous data requirements concerning firm-level performance tend to bias against developing economy and international sampling, more generally, due to poor quality of data.[3]

Clearly, sample bias has implications for generalizability of results. Though Megginson and colleagues find general privatization effects when examining share issue privatization on longitudinal performance in newly privatized firms, evidence is drawn from a developed economy empirical base. Privatization performance is less certain in a transition or emerging economy context, where capital market development is weak or market-based infrastructure associated with efficiency in the market for shares may be lacking (Kikeri, Nellis & Shirley, 1992).

We recognize Boubakri and Cosset (1998) do find evidence of general privatization effects in a sample drawn exclusively from a developing economy empirical base and not entirely comprised of share issue privatization. Yet these authors test for privatization effects using a pooled sample, thus do not distinguish performance improvement for firms privatized through trade sales, public share issues, or a combination of both strategies.

Moreover, this study as well as others (Villalonga, 2000) may suffer from another form of aggregation bias when examining longitudinal effects of privatization. In spite of the incremental nature of privatization implementation worldwide, design choice in longitudinal methodology has remained calibrated at the firm unit of analysis, measuring privatization as a single "change-of-ownership" per firm and linking this event to variance in times series data on firm performance over pre- and post-privatization periods. Where incremental privatization is present for a larger subsample of firms and multiple transaction data is aggregated, pre- and

[2] The Megginson programme (Megginson, Nash, & Van Randenborgh, 1994; D'Souza & Megginson, 1999) relies importantly on prospectus documents, as part of disclosure requirements for privatization public offerings.

[3] Developing economy privatization observations are unlikely to present reliable and comparable performance data in general. Often performance data is missing, either *ex ante* or *ex post* transaction, is of relatively poor quality, or is not fully reflecting international accounting standards. Possibly these contexts have experienced economic restructuring with dramatic relative price changes, making performance measurement even more difficult. The result is for many developing economy privatization observations to simply fall from the sample.

post-privatization performance timelines may no longer be separated, and become confounded; this attenuates the privatization performance relationship, and contributes to weaker and/or perhaps spurious results.[4]

Privatization ownership effects

Recent cross-sectional evidence on voucher privatization in postcommunist transition economies suggests privatization restructuring and improved performance is contingent upon a fairly active governance system and foreign large-block shareholders in particular (Makhija & Spiro, 2000; Djankov, 1999; Claessens, 1997). As understood in this literature, foreign blockholder effects are expected to improve performance either through "ownership effects", accessing corporate governance expertise, which reduces monitoring costs owing to resource availability and previous experience, including access to technology or know-how not available to the privatizing firm, or through informational advantages about the quality of a particular firms' assets or management. These studies rely on rather idiosyncratic data collection strategies to obtain extensive firm-level performance data.[5]

In these economies, where capital market development is weak, share issue privatization, as dispersed private ownership, by itself, may not provide sufficient incentives to shareholders to monitor management and encourage good performance in newly privatized firms. Trade sale privatization strategies introducing active investors (i.e., blockholders) and foreign large-block shareholders in particular may be necessary to distinguish privatization effects in this context.

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[4]In Boubakri and Cosset (1998), 38% of sample firms, present multiple transactions for which at least one year of the pre-post privatization performance timeline overlaps with that of another transaction for the same firm. Perhaps, market-adjusted performance results (in table l) might have been improved, were incremental privatization effects controlled for along with economy-wide factors, to discern differences in pre- and post-privatization performance. In Villalonga (2000), summary data shows 29% of panel cases (firms) to privatize incrementally with multiple transactions (ranging from 2 to 6) over a series of years, and 37% of cases to have no post-privatization performance data for years 5-6 and beyond; these matters are related, as later series transactions tend to be more recent, thus lacking in post-privatization data. As privatization is measured at firm level as a single transaction, for many of these cases, pre- and post-privatization performance effects are confounded; for certain of these and many others little data exists for post-privatization effects on performance to be analyzed. Many unusual results are on the subsample with multiple transactions or in post-privatization years 5-6 and 7-8 where little data exists. The author finds the most unusual results on multiple transaction cases and for these years, and concludes, perhaps falsely, for certain tests as a result.

[5]Survey data in Makhija and Spiro(2000) and Claessens (1997) was collected through publicly available investor information published by the Czech Ministry of Finance, Center for Voucher Privatization, while Djankov (1999) relies on private sector reviews conducted for The World Bank for survey data on privatization in transition economies, including the Czech Republic, Russia, and various newly independent states (NIS).

In sum, and stated in general terms, different shareholders may have different incentives to force restructuring, thus different restructuring effort. Large-block shareholders, in particular, have strong incentives for active monitoring, with enough financial incentive from cash flow rights to monitor management and enough voting rights in corporate governance to put pressure on management to have their interests respected. Foreign blockholders, especially, are useful as active monitors and in changing the way firms are managed for those in need of restructuring. It is assumed that active monitoring is important in a developing economy context for privatizing firms in need of restructuring, and agency considerations should play an important role in privatization performance. The following hypotheses are stated:

Hypothesis 1: Privatization strategy characterized by diffused shareholdings does not improve performance.
Hypothesis 2: Privatization strategy characterized by large-block (foreign) shareholdings improves performance.

THEORY DEVELOPMENT

From an empirical standpoint, we argue that sample and aggregation biases in the mainstream literature persist in part because longitudinal research and dynamic modeling are focused on capturing variance in firm-level performance and omit variance in the privatization process itself. At the same time, restricting empirical investigations in this way also confines the privatization construct to public share offerings (or voucher sales) and limits theory-building to modeling dynamic processes as organized through market mechanisms only. To address these weakness we offer a conceptual extension from mainstream theory with implications for both construct refinement and improved research design; this allows for more precise metrics and better specification of the privatization performance model.

Theoretical underpinning for most available studies on privatization remains grounded in property rights/agency theory perspectives (Villalonga, 2000).[6] Generally, these perspectives predict changes in ownership and corporate governance/incentives and goals, respectively, to

[6] Application of public choice theory has been used by public administration scholars to examine privatization initiatives including contracting-out of public sector services. This approach conceives privatization as the antipode of government growth, and is most concerned with setting state boundaries. In the research presented here, one aim is to examine privatization in the context of the boundaries of the firm; thus, public choice theory is left unexplored.

result, on average, in improved performance for the privatized firm. These constructs, however, are not well elaborated in the privatization literature.

A theory of privatization has yet to emerge, though recent programmatic initiatives are recognized (Shleifer, & Vishny, 1994; Boycko, Shleifer, & Vishny, 1996). In limiting explanations to market dynamics importantly, this nascent theory has been challenged for lacking a more appropriate institutional theory and in presenting an incomplete understanding of privatization restructuring as entrepreneurial transformation (Spicer, McDermott & Kogut, 2000). Critics, in particular, are reluctant to assume a degree of efficiency in capital market functioning which allows market incentives for 'efficient bargains' to be struck, allocating privatization share issues to those who value them most, thus, to the eventual consolidation of these shares in the hands of controlling shareholders willing to engage in post-privatization restructuring.[7] We argue that a more complete understanding of privatization implementation is needed in terms of what strategies and structures may be involved to spur post-privatization restructuring and improve performance when capital market functioning is less efficient.

Large shareholder model. We draw a conceptual extension from the large shareholder model (Shleifer & Vishny, 1986) as offering a more appropriate theoretical underpinning for research on privatization implementation than a general agency/property rights approach as developed thus far in the literature.

As modeled, the value of the large shareholder is not only in mitigating agency costs through incentive alignment, consistent with the monitoring role frequently assigned to equity blockholders, but also in facilitating corporate restructuring and management replacement (i.e. takeover).[8] Indeed, large shareholders are considered a necessary condition for value-increasing

[7] Spicer et al. (2000) assess influential theory-building by Shleifer and Vishny (Boycko, Shleifer & Vishny, 1995; Shleifer & Vishny, 1994) and describe the logic of voucher privatization (i.e., mass privatization. This understanding of the underlying argument in nascent privatization theory has direct relevance for other market(for-shares)-mediated privatization strategies, including share issue privatization; the authors' summary argument may be presented as follows: Once private property rights are atomized into the form of tradeable securities, and state ownership and control cut off, a depoliticized 'market' emerges with private entrepreneurship quickly filling the void left by state retrenchment. More specifically, atomized property and tradeable shares create market incentives for 'efficient bargains' to be struck (i.e., opportunities for arbitrage in exploiting information that prices convey); this process allocates securities to those who value them most, and to the eventual consolidation of these shares in the hands of controlling shareholders willing to engage in post-privatization restructuring.

[8] The large shareholder model (Shleifer & Vishny, 1986) is focused on corporate control transactions of a particular type, where cash tender offers (for stock) are made by large shareholders to other investors in order to replace inefficient management and make valuable improvements. The stock price (premium) reflects, in part, the value of these improvements for different shareholders. The starting point is a firm

takeovers to occur at all. Two core assumptions in this model are distinguished as offering cogent linkages with management research on governance in organizational economics and inter-organizational networks: 1) The value of the large shareholder stems from the joint condition of incentive alignment and exclusive access to proprietary monitoring technology for finding valuable improvements to current strategy; a recognition that 2) consolidating large shareholder positions is neither profitable as modeled nor easy as illustrated once the ownership structure of the firm is sufficiently diffuse, and corporation founders aside, large shareholder positions must be either accumulated secretly or passed from one group of large shareholders to another.

In recognizing that once shareholdings are diffuse, large shareholder positions must be accumulated secretly or transacted between one group of large shareholders to another, this model suggests share issue privatization may be unlikely to lead to consolidation of shares in the hands of controlling shareholders willing to engage in post-privatization restructuring. Plausibly, trade sale privatization strategy and direct sales to large-blockholders offers a more likely means to do so. However, in modeling the advantage of the large shareholder in aligning incentives when benefit, use and disposal rights over specialized assets (property) are fragmented, this conceptual treatment is silent on the advantage of the large shareholder as a command structure or authority system (i.e., as a governance form).

Transaction costs economics (TCE). Transaction costs economics anticipates appropriation concerns over specialized assets in exchange relationships where pervasive behavioral

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with shares initially held by a single large shareholder and by a fringe of atomistic shareholders.[8] Subsequent modeling shows under what conditions the large shareholder will further increase holdings to the point of takeover in order to replace management.

In this model current management does its best to maximize performance, yet disappoint, and face possible replacement by outsiders led by the large shareholder, who can offer an improved operating strategy. Large shareholders are assumed to have exclusive access to technology for finding valuable improvements to current strategy through monitoring and independent research. Even if many outsiders have access to the propriety monitoring technology, the presence of a large shareholder is still a necessary condition for the beneficial exploitation of this technology.

Informal negotiation by large shareholders (i.e. using "voice" or "jawboning") with current management is considered sufficient to induce less valuable improvements. Yet replacing current management with the large shareholders' own top management team may be necessary in order to get a significant portion of the gains from monitoring technology and independent research. This is because current management may lack the competence to affect the specific improvements or the ability of the large shareholder to oversee proposed changes may be limited without a controlling block of the firm's shares.

Consolidating shares in the hands of large shareholders, however, is neither profitable as modeled nor easy as illustrated once the ownership structure of the firm is sufficiently diffuse; and corporation founders aside, large shareholder positions must be either accumulated secretly or passed from one group of large shareholders to another.

uncertainty and contracting problems exist, recognizing certain governance structures (as implicit or explicit contractual framework) to have an advantage.

In the transaction cost framework the study of markets and of prices, and *ex ante* incentive alignment gives way to the study of transactions and *ex post* governance, with special emphasis on the mechanisms of intertemporal contracting. As an approach, TCE is an exercise in comparative institutional analysis. One form of organization is always compared with one or more alternative forms for transacting an exchange in supplying a good or service (i.e., markets vs. 'hierarchies' debate). The transaction is the basic unit of analysis. The discriminating alignment hypothesis predicts transactions, which differ in their attributes, to be aligned with governance structures, the implicit or explicit contractual framework within which a transaction is located. The choice among governance forms is shaped by comparative costs of devising, monitoring, and carrying out transactions under alternative forms. The firm (or hierarchy) is chosen as a governance structure when the costs of carrying out certain exchange transactions in the open market are greater than organizing these transactions within the firm.

Generally, an appropriate governance structure would economize on bounded rationality and safeguard transactions against opportunistic behaviour. Yet, transaction costs chiefly turn on the type and degree of asset specificity involved in the exchange. Asset specificity is "the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrifice of productive value" (Williamson 1988: 70). Numerous types of asset-specificity have been distinguished (Williamson, 1985). When assets are highly specific to the parties of a transaction, a small-numbers exchange condition arises and leads to the potential of serious opportunism. In this case, hierarchy is preferred to the market as a governance form.

Hierarchy or organizations are important under the TCE framework, but tend to be irrelevant in agency theory precisely because these two approaches differ on the matter of contractual completeness (Williamson, 1996). The agency theory tradition concentrates all of the contracting behaviour in the *ex ante* incentive alignment stage of the contract, while in the transaction costs approach behavioural uncertainty and contract incompleteness is anticipated up front and economized for *ex post* by choice of governance form (i.e. *ex post* governance fills in the details). The TCE approach, in effect, reduces opportunism by substituting "fiat" for a contractual relationship; the agency view describes the firm as a "nexus of contracts" (Alchian

& Demsetz, 1972; Jensen & Meckling, 1976; Fama, 1980), and no different from the market in contractual respects.

Hybrids. Williamson (1991) clarifies the concept of governance in going beyond the polar forms, markets and hierarchies, to elaborate intermediate forms, hybrids. Hybrid mode of governance, such as longterm contracts, joint ventures, etc. (Williamson, 1996) occupies a position somewhere between the two ends of the market-hierarchy continuum, and are said to have stronger incentives and adaptive capabilities than hierarchies, while providing more administrative control than markets. Hybrids are chosen when asset specificity of the transaction concerned is of an intermediate degree, while hierarchies handle extreme degrees of asset specificity.

Kogut summarizes TCE logic on hybrids as joint ventures this way: the "situational characteristics best suited to a joint venture are high uncertainty over specifying and monitoring performance, in addition to a high degree of asset specificity" (1988: 320). High degree of asset specificity precludes arm's length market transactions, while high uncertainty over performance makes even a longterm contract difficult and costly to stipulate *ex ante* the complex conditions and contingencies for monitoring performance and guarding against opportunism. A joint venture addresses these situational characteristics in providing superior alignment of incentives through the mutual dedication of resources and in sharing residual value of the venture. Similar logic has been used to extend internalization theory to explain cross-border joint ventures (Beamish & Banks, 1987).

Recently, scholars in strategy and organization have combined TCE logic on hybrids with complementary inter-organizational learning arguments[9] (see, Mowery, Oxley, & Silverman, 1996, for instance). From a networks-for-learning perspective, where transaction costs are

[9] Kogut (1988) proposes an organizational learning approach to joint ventures as an alternative understanding. From this perspective, a joint venture is a means for firms to exchange and/or imitate organizational knowledge in order to learn or seek to retain capabilities; it is best suited for transferring knowledge that is organizationally embedded and to replicate experiential knowledge that is not well understood (i.e. tacit). For transactions that are the product of complex organizational routines, the transfer of such know-how can be severely impaired unless the organization itself is replicated to some degree. Joint structures are encouraged where one or more firms desire to acquire the other's organizational know-how or where one firm wants to maintain an organizational capability while benefiting from another firm's current knowledge or cost advantage in order to retain an option to exploit the capability in the future. This may be the case when neither firm owns the other's technology, nor understands the other's organizational routines, and changes in the market or industry environment demand improvement in know-how, capabilities, or both.

directly related to the type of technical capability and/or know-how that is to be transferred between firms, the more important advantages of hybrid forms result from reducing the impacts of bounded rationality and opportunism on the transfer between partners (Tsang, 2000).

Privatization firm effects

In the privatization literature it is posited that certain large-block shareholders improve performance either through better "ownership" or through informational advantages about the quality of a particular firms' assets or management (Djankov, 1998; 1998). Often this distinction is made to tell real ownership effects from artifact or spurious effect (and the latter referred to as an endogeneity problem). Claessens (1997) explains it this way:

"A misspecification can arise if the ownership structure of the firm is endogenous to its value because of informational advantages certain investors have. For example, if certain investors had private or inside information about the quality of a particular firms' assets or management, then they would have been attracted to the better quality firms. As a result, better firms could have ended up with both a more concentrated ownership as well as higher (performance). A simple regression of (performance) on indicators of ownership concentration would then be biased."(:1645)

However, it is possible that shareholder governance structure, the economic organization behind a large-block shareholder, may provide an advantage for minimizing the transaction costs in 'knowing' the firm-specific assets of the privatising enterprise. This understanding is consistent with our reasoning below, when we ask, does large shareholder governance structure also matter? Furthermore, this understanding is consistent with 'resource' and 'experience' based explanations for the special effect that foreign blockholder demonstrate in improving privatization performance offered in the corporate governance literature on privatization in postcommunist transition economies. Our conceptual extension provides theory-based explanation for understanding these blockholder effects.

Novel hypothesis. It is assumed that safeguarding firm-specific assets and inter-firm knowledge transfer is important in a developing economy context for privatizing firms in need of restructuring, and transaction costs considerations should play an important role in privatization performance. Our basic argument is summarized in two parts: The uncertain and complex challenge of post-privatization restructuring may depend not only on aligning incentives, but also 1) aligning governance structures, specifically, aligning hybrid structures to

privatization transactions where moderate asset specificity is assumed present for at least one of the parties; furthermore, where post-privatization restructuring depends in part on inter-firm transfer of proprietary knowledge, or technological organizational capabilities more generally, this learning process will be fostered by hybrid structures as 2) equity-based inter-firm networking. From this reasoning we advance a novel hypothesis on the privatization performance relationship:

Hypothesis 6: Privatization strategy characterized by hybrid governance improves performance.

METHODS

Units of investigation

Developing economy privatization implementation strategies are identified as the population of interest. We expect that in these economies capital market development will be weaker, and as a population frame should present an appropriate research context for purposes of comparative institutional analysis (i.e. an institutional set up), offering numerous instances of trade sale privatization, share issue privatization, and a combination of both strategies.

Privatization implementation strategy as an incremental process was examined using a transaction unit of analysis and a sample drawn from the fixed-line telecommunications sector. Single-industry studies in the privatization literature are not uncommon[10], yet few infrastructure studies have examined the telecommunications sector (see, Foreman-Peck & Manning, 1988) though some recent research exists (Ros, 1999; Ros & Banerjee, 2000; Wallsten, 2001) as well as certain preliminary work (Bortolotti, D'Souza, Fantini, Megginson, 2001).

We recognize a trade-off to generalizability in selecting this sample frame. However, limiting the analysis in this way presents certain advantages when examining privatization performance in developing economies, such as an appropriate observation scale for conducting longitudinal research, a sizeable population frame from which to draw a larger sample, and better access to reliable data.[11] Furthermore, the effects of telecommunications privatization continue to be

[10] Certain infrastructure investigations include airlines (Eckel, Eckel & Singal, 1997), electricity (Newberry & Pollitt, 1997), and railroads (Caves & Christensen, 1980; Ramamurti, 1997).

[11] First, in selecting telecommunications, our study offers an appropriate observation scale. As the modern era of privatization began importantly in the early 1980s, and that for many developing economies telecommunications privatization has served to launch a government's privatization program,

critical public policy issues in many developing economies, and with few extant studies to draw upon, how can policy makers, managers of multinational corporations investing in privatizing enterprise or current managers of the target firms themselves evaluate which privatization implementation strategies are likely to be associated with better performance outcomes? These evaluations will benefit from contributions made here to examine differential effects of privatization strategies.[12]

A basic assumption made for this industry context is that changes to regulation, competition and technology have altered the bundle of strategic competencies and assets necessary to compete in various segments of the telecommunications industry. Though asset specificity is not measured directly here it is presumed non-negligible. Taken together, these assumptions suggest hybrid structures and inter-firm networking for resource-based organizational learning to be relevant for this research context, offering a fair test for our study.

Telecommunication infrastructure worldwide shares many of the same investment characteristics. Despite differences in quality that may exist across countries in term of infrastructure, the privatization of fixed-line incumbents presents a classic case of transacting under conditions of high asset specificity due to sunk costs in non-deployable assets (Henisz, 1998 in Levy and Spiller, 1996). Differences exist, however, in terms of international variation in the larger institutional context surrounding telecommunications privatization, thus when specifying performance institutional environment may no longer be considered exogenous. Our study uses the developing economy population frame to limit to some extent the institutional

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from a single industry standpoint, this sector presents numerous instances of privatization implementation strategies and offers a sizeable population frame, a longer and/or earlier series of transactions from which to draw a larger sample of observations. A period such as this is conducive to longitudinal research and essential for investigating privatization implementation as an incremental process. Likewise, ability to capture privatization effects where they do exist is enhanced with an earlier series of transactions observations, as a sufficient post privatization period likely exists. In this way, a telecommunications sample frame helps address key challenges in privatization research, notably, the 'small *n*' drawback and the difficulty in capturing 'small population effects'. Second, though data access and reliability present a serious impediment to privatization research, more so for a developing economy population frame, incumbent telecommunications operators are large, established, well-known companies in a strategic sector, attracting much interest, reporting and scrutiny; a research context such as this offers multiple different data sources allowing cross-validation of data, augmented measurement precision, and stability of findings.

[12] The nature of telecommunications as a strategic factor for economic development affecting growth at country, region, and firm levels (Koski & Majumdar, 2000), suggests telecommunications privatization and related sector reforms to be central policy initiatives in many developing economies. Poor performance and inefficiency by key telecommunications incumbents is likely to threaten competitiveness in computer, software, and information industry markets in particular, perhaps impacting post industrial economic development in transition and emerging economies most notably.

parameters and fixed factors which will be in play in a cross-country transaction sample, possibly shifting the comparative transaction costs and appropriate mechanisms of governance in an exchange (Williamson, 1993). Nevertheless, where idiosyncrasies exist in the telecommunications industry that have implications for transaction strategy during the privatization implementation process, generalizability of specific findings in our study may be limited further.

Sample selection and data collection

Privatization as an incremental process was examined using an event-driven data recording strategy suitable for observing change phenomena that occurs infrequently, randomly, or evolves over time (Gersick, 1991, in Zaheer, Albert & Zaheer, 1999). Multiple data sets and records were consulted to augment reliability and validity. (See, Table 1A, Data Sources, in the appendix , for a summary.) Sample selection was straightforward, and involved a process of matching a developing economy sample frame to privatization transactions by fixed-line telecommunications incumbents. Once the basic sample frame was constructed valid performance data was sought for a sample size sufficiently large to allow for statistical analysis.

Prior studies suffer from sample bias because of very real difficulties in obtaining cross-country, comparable firm-level performance data for trade sale privatization. Our study attempts to partially overcome this by selecting a developing economy population frame to introduce privatization strategy variation (i.e. share issue privatization and trade sales), and foregoing firm-level performance for industry-level performance data. Data features and sample selection protocol are discussed next.

Economy-level. Following Boubakri and Cosset (1998), a developing economy sample frame was identified using the World Bank classification of economies, as appears in the 1999 *World Development Indicators*. This classification defines as developing or emerging a country with a low or middle income, based on (1996) gross domestic product (GDP) per capita. These tables were used to match privatization transactions occurring in developing economies. This cross-sectional instrument was assessed for maturation risk and judged adequate in framing the longitudinal sample in this study.[13]

[13] To address suitability in using a cross-sectional instrument to frame a longitudinal sample, the 1996 tables were compared to earlier classifications to assess the stability of the population frame and identify possible maturation threat, movement across income categories. The review showed no countries maturing between upper-middle and high income, moving in or out of the developing economy sample

Transaction-level. Data on basic privatization transactions attributes was obtained from three archival sources, including The World Bank *Privatization Database*, and the *Mergers and Acquisitions* (M&A) and *Share Ownership* databases, both from Securities Data Corporation. The World Bank database reports actual privatization transactions in developing economies for all sectors for the period 1980-1997. The Securities Data set reports completed (actual) and announced (intended) corporate restructuring transactions identified with privatization initiatives for telecommunication sectors worldwide from January 1, 1984 to October 15, 1999. A preliminary transaction set was assembled by extracting telecom sector transactions from The World Bank database and combining these with completed transactions from Securities Data sets. A 1998 cut off year was chosen to allow a minimally sufficient post-privatization performance timeline for more recent transactions. Transactions were crosschecked for accuracy along attributes and multiple entries removed.

World Bank surveys on privatization are recognized as reliable and have been used in numerous broad-based empirical studies on privatization performance. Our study draws on the more comprehensive and up-to-date *Privatization Database*.[14] Similar to Uhlenbruck and DeCastro (2000), we combined archival data on privatization with data on mergers and acquisitions to examine privatization acquisitions in developing economies.[15] Most important, augmenting privatization data with corporate restructuring records improved the likelihood that sample observations were drawn from the market for firms/partners and not restricted to the market for shares.

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frame. Though not a comprehensive assessment the appraisal suggested the instrument to be adequate for the purposes here. Boubakri and Cosset (1998) leave maturation risk unaddressed though sample selection is limited in a similar way.

[14] A listing of privatized firms provided in Candoy-Sekse and Palmer (1988), Techniques of Privatizayion of State-Owned Enterprises: Inventory of Country Experience and reference Materials (The World Bank, Washington, D.C.), has been a standard data source for broad-based research on privatization performance, see Megginson et. al. (1994) and Boubakri & Cosset (1998), for instance; though the latter study has also drawn on data collection by Sader (i.e. Sader (1993). Privatization and Foreign Investment in the Developing World, 1988-1992, Policy Research Working Paper 1202 (The World Bank, Washington, D.C.), who contributed to a precursor database to the World Bank electronic archival source, *Privatization Database*. D'Souza & Megginson (1999) do not make explicit the initial data source for their privatization frame, though the authors do indicate using the same methodology as the two prior studies. Preliminary research in Megginson, Nash, Netter & Poulsen (2000) does use the World Bank Privatization Database (1990-1998) as a key data source. Uhlenbruck & DeCastro (2000) cite a World Bank archival database, but do not specify.

[15] Data in both DeCastro and Uhlenbruck (1997) and Uhlenbruck and DeCastro (2000) are collected from the New-York-based investment information firm Investment Dealers' Digest, Inc. Mergers and Acquisition database. The earlier study uses only M&A data.

Industry- and Firm-level. Fine-grained data on telecommunication privatization, ownership, and corporate restructuring was obtained from a large quantity of specialized published material, including the International Telecommunication Union (ITU) occasional series, *General Trends in Telecommunication Reform (1998),* and the Economist Intelligence Unit (EIU) monthly series, *Telecoms & Wireless (1994-1999)*. *General Trends* provides country profiles on sector reform based on qualitative and quantitative data collected from a survey of national administrations, including telecommunication ministries, regulators, and operators, in 189 member states conducted in 1996-1997 (country responses verified in 1998). Updates from abridged editions for 1999 and 2000 were solicited directly from the ITU Development Bureau in Geneva, Switzerland and used to supplement missing data and clarify qualitative reporting. Information on regulation and competition was collected from this series as well. *Telecoms & Wireless* provides market intelligence for strategic sector activity worldwide.

The 1998 volumes and 1999-2000 updates for *General Trends* and Market Alerts in 190 issues of *Telecom & Wireless* for the period 1994 to 1999 were content-analyzed for fixed-line incumbent privatization in the developing economy sample frame. Wallsten (2001) also draws on *General Trends* and EIU publications to investigate telecommunications competition, privatization and regulation but restricts data collection to limited qualitative material. The micro-data analysis in our study was used to crosscheck transaction records, identify omitted observations, confirm appropriate unit of analysis, annualize transaction data, and detail transaction characteristics, including complex trade sale transactions. Numerous coding rules were developed to ensure coding reliability across the data sets.[16] Protocol and analysis helped augmented the transaction set, increasing sample size.[17]

[16] Sample selection coding procedures applied the following decision rules. Where conflicting or ambiguous records existed across data sets, coding preference was given to ITU *General Trends*, or national administration sector expertise as reported by international sector specialists. To ensure coding reliability the operator set was initially dichotomized to exclude non-privatizing cases, incumbents that were: 1) state-owned, planning or not planning to privatize; 2) corporatized, planning or not planning to corporatize, 3) exclusive ministry (or other government office) providers, or not separate in terms of post and telecommunications functions. In all cases, *General Trends* records either confirmed exactly or broadly *Telecom & Wireless* data, or provided the only record. In no case did these records present contradictory data.

These records also helped distinguish fixed-line incumbent transactions from those of other telecommunications operators. For most transactions unit of analysis was confirmed. However, six countries (Argentina, Brazil, Chile, Peru, Russia, and Federal Republic of Yugoslavia) had more than one privatizing incumbent over the 18-year observation period. The following decision rules were used to

Performance. The final criteria for sample selection relate to performance data. To our knowledge, only three studies have focused on trade sale strategies. Two investigated antecedent conditions and not performance outcomes (De Castroi & Uhlenbruck, 1997; Megginson, Nash, Netter, Poulsen, 2000), and one relied on self-report performance data (Uhlenabruck & De Castro, 2000). In our study, we used objective, industry-level data, universally available and comparable across a larger sample of developing economies. Industry-level data was obtained from the ITU *World Telecommunications Indicators Database* (1999), considered the best cross-country data available for this sector (Wallsten, 2001). This source presents annual time series data on telephone network, service quality, tariffs, revenue, and capital expenditure for over 200 economies for the period 1975-1999 (year end). Updates from January 2001 adjustments were sought directly from the ITU Development Bureau to ensure reliability on the most recent figures.

It is not inappropriate to examine trade sale privatization performance effects using industry data. Inter-firm hybrid structures (and notions of strategic collaboration, knowledge sharing, and pooling of resources) are recognized as group level entities viewed at an industry level of

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select the appropriate incumbent unit of analysis. For countries with alternative (i.e., several) 'national' incumbents due to political secession, or with multiple incumbents due to regional operator mergers or national operator breakups and all incumbents provided a combination of domestic and long distance services and none was identified as the fixed-line operator, multiple units of analysis were collapsed into single country-sector observations and incumbent transaction observation values averaged. In collapsing the units of analysis the assumption was that transaction values on ownership and hybrid governance were similar across incumbent observations; this assumption was more accurate for observations in Argentina, Brazil, and Peru, and less so for Chile and Yugoslavia. For countries with a national incumbent with numerous distinct regional business units and none identified as the fixed-line operator, the corporate level incumbent served as unit of analysis and corporate transaction observation values used instead. In shifting the unit of analysis higher the assumption was that transaction values on ownership and hybrid governance at the corporate level were similar to those at the operator level. Records showed this not to be inaccurate for the only case, Russia. Aggregating data in this way, along with implications for measurement on key independent variables, was judged not too inappropriate given that data for the dependent variable is also aggregated (at industry/country-levels). Nevertheless, these decision rules represent certain imperfect solutions albeit on only a limited number of observations.

[17] Additional observations showed the following characteristics: where transactions occurred early on during the recognized trend in privatization or in certain geographic areas; or where it was likely that privatized ownership was not reported as privatization policy *per se* or that private owners were not identified. Observations such as these may have fallen, either explicitly or implicitly, outside World Bank or Securities Data recording range.

For most observations transaction year was confirmed. For the following four countries there was uncertain, conflicting, or missing transaction years, and sector expertise was not discriminating: Argentina, Chile, Bahrain, Belize, Czech Republic, Georgia, Guinea, Guyana, Jamaica, Pakistan, and Sudan. For these observations, event year was identified as the most frequently reported year, or the year in which the largest ownership or hybrid governance change was reported.

analysis (Dansereau and Yammarino, 1999), and, normally, data should conform to the level of theory (i.e. entity to depict or explain) (Klein, Dansereau & Hall (1994). Wallsten (2001) and Ros and colleagues (Ros & Banerjee, 2000; Ros, 1999) also have used industry-level *Indicators* data to examine telecommunications privatization performance, though drew from smaller samples or a regional focus. Other cross-country research has been limited to telecommunication privatization (Boylaud & Nicoletti, 2000) or telecommunications infrastructure provision (Koski & Majumdar, 2000) in developed economies only. Despite extant research on telecommunications reform, key questions on sector efficiency remain empirically unaddressed (Saunders, Warford, Wellenius, 1995 in Koski and Majumdar, 2000).

Final sample. Using the criteria above the sample selection process offered an initial sample list of 76 transactions for 50 incumbent fixed-line operators. Twelve transactions in 11 countries were dropped because of missing performance data**.** This last matching procedure presented a final sample of 64 privatization transactions by 41 incumbents in 41 developing economies over an 18-year period, spanning 1981 to 1998. (See Table 2A, in the appendix for the sample list.)

The sample showed privatizing operators to represent 28% of all developing economy incumbents; for fifteen incumbents (37%) on 38 observations (59%) privatization involved multiple transactions. Though a single industry study, this international sample is one of the largest to date to investigate privatization in developing economies, and the only to examine privatization incrementally. Overall, sample size is adequate for regression purposes, for the general telecom population, and realistic compared to prior studies on privatization.

The average transaction year was 1994, and is indicative of a shift towards privatization in highly regulated industries, in both developed and developing economies, during the 1990s (D'Souza & Megginson, 1999). Incumbents were drawn from countries across a broad range of regions, though observations were fewer in Asia and Africa and more heavily weighted for both Latin America and the Caribbean (LAC) (32%) and East Europe and Central Asia (ECA) (31%) regions. (See, Table 3A, in the appendix for sample regional distribution) This regional distribution is consistent with historical patterns and reflects more extensive privatization initiatives in LAC and ECA regions during the 1980s and 1990s, respectively (Megginson & Netter, 1999). To evaluate the potential regional bias the models presented here were reestimated with region dummies for LAC and ECA to ensure that results were not sensitive to

regional distribution. The dummies added little explanatory power to the main models but did reduce degrees of freedom, thus are not included in subsequent analysis. Once a temporal variable was specified regional differences became less important (as earlier LAC and later ECA transactions were controlled for in the statistical modelling).

Model specification and measures

We use longitudinal design and a transaction unit of analysis to capture the dynamic process of privatization implementation itself and treat pre- and post-privatization performance periods more appropriately. This allows for change and stability over time in firm-level ownership and inter-firm hybrid governance, permitting ownership and (inter-) firm effects to be disaggregated, similarly, for pre- and post-privatization performance to be disentangled. Considering multiple levels of analysis and changes in levels of analysis that may occur over time, should serve to improve understanding of dynamically changing organizational phenomena (Dansereau & Yammarino, 1999).

There are calls in the strategy and organization literature to recognize privatization implementation as an incremental and complex process, comprised of different strategies with unique characteristics, and to examine this process using a multidimensional privatization construct (Zahra, Ireland, Gutierrez, & Hitt, 2000) and a dynamic multilevel model (Ramamurti, 2000) to capture observed yet unexplained performance variance. At the same time, organizational factors are recognized to be likely intervening variables in the privatization-performance relationship and should be taken into account also (Villalonga, 2000). Only a few researchers appreciate the privatization performance relationship to hinge on organizational restructuring (Boycko, Shleifer & Vishny, 1996) and an internal adjustment process (Martin & Parker, 1997). We advance hybrids, for this purpose, as transaction-specific strategy and meso-level organizational implication of trade sale privatization and corporate restructuring to help clarify differential privatization performance outcomes.

Econometric model. The basic structure of the econometric model used to differentiate performance consists of three vectors of explanatory variables: the controls, as (1) time, and (2) institutional and fixed factors (competition, regulation and income); and privatization strategy, as (3) transaction-specific characteristics, ownership structure (large-block shareholdings and diffused shareholdings) and governance form (hybrids). Performance change was estimated using the following multiple regression equation: where X_1 is the vector for the temporal

variable, X_2 the vector of institutional and fixed factors, X_3 the vector of transaction-specific variables, and *u* the normally-distributed, random error term. Equation 1 was estimated using ordinary least squares (OLS).

Equation 1

$$\Delta perf = \alpha_0 + \alpha_1 \chi_1 + \alpha_2 \chi_2 + \alpha_3 \chi_3 + \mu$$

Explanatory variables. The first group of explanatory variables operationalizes the distribution of ownership in the transaction strategy as either blockholdings or dispersed shareholdings. Similar to cross-sectional research on privatization in transitional economies (Makhija & Spiro, 2000; Djankov, 1999; Claessens, 1997), we use more refined measures in examining blockholder type.

We used an informed set of keywords (see Table 4A in the appendix) and coding protocol[18] to construct ownership metrics from content analysis on incumbent ownership data. From this,

[18] The literature identifies potential large-block shareholders to include managers, employees, strategic investors (local or foreign), institutional investors, individual investors, and the state. We drew on the identity of these owner classes to generate an informed set of keywords used for content analysis on the incumbent ownership data; six ownership types of interest were distinguished in the sample, including State, Telco (telecommunications operator), Institutional (financial institutions), Other Company, Employees/management, and Investors. Initial private ownership categories did not distinguish between foreign and domestic ownership.
The following procedures were used to construct the metrics. To ensure reliability coding rules were kept simple and straightforward, and were clarified as coding progressed.
For each transaction ownership was measured on continuous variables as percentage of total equity shareholding by owner class (ownership structure across types summed 100 %).
Particular attention was directed to distinguishing amongst new privatized ownership, discerning non-state large-block shareholdings from diffused shareholdings. In our study, Investors were, by definition, diffused and represented the atomized private ownership category, where reporting indicated no consolidation of shares. In addition, Investors served as the 'residual' private ownership category, where left over private ownership was allocated during the coding process. Generally, where fractions of total equity were unaccounted for and left unaddressed, these amounts were allotted to one of two residual categories. State blockholdings represented the non-private residual ownership category.
Possibly, residual privatized ownership may be consolidated in the hands of institutional investors such as mutual funds and not reported; this would bias coding downward for Institutional ownership and upward for diffused shareholdings, Investors. Underdeveloped capital markets and weak secondary trading are likely conditions in our research context; this would reduce such measurement error, though it is recognized here. Likewise, Other Company ownership may not receive adequate reporting in comparison to well-known global Telco(s) or the State, and undercounting would result; this would likely bias coding downward for Other Company and upward for Telco and residual categories, State and Investors.
Where owner identity was explicit and fractions of equity shareholdings reported summed 100, coding was most straightforward. The following protocol was used to quantify more qualitative reporting. State residuals were coded when reports indicated incumbents to be "partially privatized" and Investor residuals when "fully privatized", or other synonymous terms were present. Where distinct owner classes were identified yet only combined percentage shareholdings reported, the amount was allocated evenly. Where the privatizing incumbent's name was a known global telecommunications operator and no ownership data was reported, ownership structure was coded as 100% Telco. Where the incumbent name

four owner classes were distinguished with relevance to the sector and measured using continuous variables of total shareholding (sum 100%): three measuring potential large-block shareholdings, including State, Telco, and Foreign; and one measuring diffused shareholdings, Investors.

Hybrid governance as an organizational structure was operationalized as an inter-firm network, using network models as developed in diverse yet related areas of sociology and economics. A network can be defined as the pattern of direct ties linking a defined set of firms, and inter-firm network as an abstract concept for a set of nodes (firms) and the (equity-based) relationships that connect them (i.e. n nodes – 1 = n ties). Generally, this hybrid construct is consistent with definitions of an equity-based strategic alliance.

The direct equity ties created by trade sale privatization strategy that combine to form hybrid structure was measured as a count variable. Using straightforward coding procedures a count was made of the number of new owner partner firms investing in the focal privatizing firm.[19] Inter-firm network tie formation or "hybridness" will vary depending on whether privatization trade sale strategies include simple 'asset' transfer to a single company, a joint venture investment in the privatizing firm, or more complex consortia sales. In our study, hybridness

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was nonspecific, identifying telecommunications operations and/or country location only, and reported as "private", ownership structure was coded 100% Investors.
Subsequent descriptive statistics showed negligible data and inappropriate distributions for Institutional, Employee/management, and Other Company variables. As a result, these minor blockholder types are dropped as separate ownership variables. Instead, an additional variable was defined, Foreign blockholder, where all or at least one blockholder was known to be foreign-based, and constructed by re-coding non-foreign Telco, Institutional, and Other Company ownership as 0, then summing percentage shareholding across these categories. As defined, all ownership for original blockholders was identified as "foreign", except on 2 transactions for Other Company. With Foreign and Telco now measured as distinct variables, we recognize Telco to be a measure of privatized ownership held by various multinational telecommunications operators.

[19] The following decision rules guided measurement. For every Telco, Institutional, and Other Company link to the privatizing firm one tie was added; the cumulative total measured the total number of network ties; when no new owner partner firm is involved in the transaction no inter-firm ties are formed (i.e., inter-firm network = 0). Where holding structures mediated direct ownership ties between partner firms and the privatizing firm, the following decision rule was used: where the ownership structure of the holding company was identical in terms of ownership class(es) and percentage equity held to that of the 'parent' above, only one distinct node was recognized, and 1 tie added. Where conglomerate or business group owners were identified and first-order ownership distinguished only, more than one node with distinct ownership was presumed to exist, whether parent, subsidiary or partner, and a conservative number of 2 ties added. The count was not increased for Employees as no employee stock ownership plan or fund (i.e. investment companies) was reported in our sample. Likewise there was no increase for (diffused) Investors by definition as coding for this owner class reflects no known consolidation of shares. Neither was the count increased for State as a blockholder nor state funds or holding companies as no new private ownership ties were introduced and ownership in such holdings was assumed identical to the 'parent'.

ranged from 0 to 6: Zero ties indicated no hybridness (i.e. "market" governance), while 1 through 6 ties indicated increasing degrees of hybridness.[20]

This count measure conforms to social network analysis concepts of degree centrality (Freeman 1979) and density of ties (Coleman, 1990). A common assumption from these perspectives is that knowledge and resources are broadly distributed, and the locus is found in a network of inter-firm relationships. Direct ties potentially providing resource-based knowledge-sharing amongst network members. A network governance approach suggests higher density of ties provides multiple channels for knowledge transmission (Kogut & Walker, 2001). In this way, hybridness or degree of inter-firm networking is reflected in the density of ties. Our measure is also consistent with the concept of equity alliance as understood in the strategy literature.[21] Though we use a simple count variable, this metric is likely more powerful than a discrete variable, and may improve the likelihood that an additional source of performance variance is captured.

There are calls to specify privatization as a multi-dimensional construct (Zahra, Ireland, Gutierrez, & Hitt, 2000), however, very little of this work addresses issues of operationalization. Theory-building by management scholars does suggest a meso network concept to understand corporate privatization strategy (Doh, 2000) and privatization effects relevant for organizational learning (Zahra et al., 2000), yet certain still offer more traditional organization structure constructs (i.e. decentralized organization structure) to capture intervening variables for privatization performance (Cuervo & Villalonga, 2000). De Castro and Ulenbruck do examine trade sale privatization (privatization acquisitions), though measure the transaction using a dummy variable[22] (De Castro & Ulenbruck, 1997) or simply select trade sale transactions as the sample frame (Ulenbruck & De Castro, 2000), offering no direct measurement. Certain preliminary research examines privatization strategy using a discrete choice model and the

[20] Where full privatization is characterized jointly by a single new blockholder (1 tie) owning 100% of incumbent ownership, "hierarchy", or internalization, would be present. In our final sample, there was no such case.

[21] Definitions of equity alliance cover exchange agreements where partners share or exchange equity, including agreements where partners create a new entity in which equity is shared as well as those where one partner takes an equity interest in the other (Gulati & Singh, 1998). In our study, where new owners create a separate joint venture from which to invest directly in the privatizing incumbent both definitions of alliance apply.

[22] Type of acquisition: 0 if 100% acquired; 1 if only an equity stake.

conventional reduced form set-up that it implies (i.e. dummy dependent variable for purposes of logit analysis) (Megginson, Nash, Netter, Poulsen, 2000).[23]

We recognize that the practitioner-based concept of privatization trade sale has not received attention in the empirical literature; neither has the network construct been advanced in this way in a larger sample statistical study on privatization performance effects.

We distinguish our network analytic from that of the technological and physical facilities network[24], yet where inter-firm networks affect larger scale fixed-line performance, our study has relevance for multiple level network effects. We also distinguish our analytic as consistent but not synonymous with pyramid structure, as defined and operationalized in the ownership literature on private benefits of control.[25] It may be that inter-firm networks and pyramid structures offer complementary understandings for complex structures in the ownership and control literatures.

Control variables. In addition to the theoretical variables discussed above, several additional regressors were incorporated into the specification to isolate non-ownership and non-hybrid governance influences on performance; the most important limit variation across time for a longitudinal sample and across institutional context and fixed factors for a cross-country sample.

To control for unobserved temporal effects[26] in examining incremental privatization over an 18-year period a year trend variable was constructed and measured using the first sample transaction year as a baseline. Range was 1 to 18 and assumes linearity in the effect of time. No differences were observed in results based on alternative controls for time, using dummy variables or split sampling. To correct for skewness and mitigate effects of extreme cases a transformed year trend variable (year trend power 3) was used in subsequent analysis.

[23] Logit analysis is used and requires the dependent variable to be discrete.

[24] The telecommunications systems built upon an array of heterogeneous yet interrelated technical components (Majumdar & Venkataraman, 1998).

[25] LaPorta, Lopez de Silanes, & Shleifer (1998) distinguish pyramids where controlling shareholders exercise control (using threshold levels of 10% or 20% ownership concentration) through at least one publicly traded company. In our study, operationalization of hybrids as inter-firm networks did not distinguish whether holding structures were publicly traded, rather our focus was to disaggregate measurement on ownership structure from organizational structure.

[26] Important implications likely stem from industry technological change, general changes in economic environment and population during this period, as well as from public policy 'learning' in designing privatization programmes and specific transactions more effectively over time.

Many researchers conclude that competition and regulation are more important than ownership in determining performance (i.e. Vickers and Yarrow, 1988; Demsetz & Lehn, 1985)[27]. To control for aspects of competition, we construct a contestable markets measure using categorical data from *General Trends* reports tapping degree of ease of entry into key telecommunications markets, including local, domestic long distance, and international long distance.[28] Similar indictor variables have been used in recent empirical research on telecommunications privatization (Ros, 1999). From this data a single count variable was constructed measuring aggregate competition across all three markets; range for this variable is 0 to 3 (i.e., 0 indicates no partial or full competition in any of the key markets; 1 indicates competition in 1 key market; 2 in 2 key markets; and 3 in all 3 markets). Aggregating market status improved variation in competition across the sample to some degree. More refined measures on competition were not sought as extant variation was clearly lacking in our sample of 'dominant' operators; furthermore, testing which matters most ownership, competition or regulation was not a central aim in this study.[29]

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[27] A broad understanding suggests competition and regulation to provide market discipline and monitoring likely to impact on performance outcomes. In addition, these mostly exogenous factors are thought to restrict options available to owners, thus reducing the control potential of managing firm-specific risk in ways not fully reflected in more concentrated ownership or joint governance structures. Thus, policymakers should focus primarily on improved regulatory capacity and making markets work well.

[28] *General Trends* reports categorical data on level of competition for key telecommunications markets, including local, domestic long distance, and international long distance. Market status was indicated as either: monopoly, where service is provided exclusively by one operator; as partially competitive, where limits exist on the number of licensees, geographical coverage, foreign ownership for that market; or fully competitive, where any company can license for service provision, with no limits on number of licenses. This reporting indicates legally permissible competition and may not necessarily reflect extant competition in these markets. Nevertheless, the data likely informs on degree of ease of entry (i.e. contestability) for these key telecommunications markets. From this data three dummy variables were constructed to indicate competition (1=partial or full competition; 0= monopoly) in each market (local, domestic long distance, international long distance). To retain degrees of freedom the indicators were combined into a single count variable measuring aggregate competition across all three markets. The variable ranges from 0 to 3 (i.e. 0 indicates no partial or full competition in any of the key markets; 1 indicates competition in 1 key market; 2 in 2 key markets; and 3 in all 3 markets). Aggregating market status improved variation to some degree: when each market is considered separately, monopoly status is indicated on average for 70.53% of sample observations; when aggregated across key markets, monopoly is indicated for 53.1% of observations

[29] More refined measures on competition were not sought for two reasons, beyond data limitations in place when developing consistent metrics across this larger developing economy sample. First, extant variation along competition was clearly lacking in our sample. For instance, most sample incumbents are listed by the Federal Communications Commission as dominant operators, presumed to possess market power in key product markets (i.e. more than 50% market share in international transport facilities; intercity facilities and services; and local access facilities and services on the foreign end of the U.S. route). Moreover, this presumption extends to all carriers that control, are controlled by, or are under common control with, the carriers identified as dominant operators (i.e. including joint venture partners,

We control for regulation also at the industry level. Following Wallsten (2001) and preliminary research on telecommunications privatization (Bortolotti, D'Souza, Fantini, Megginson, 2001) regulation was measured using a dummy variable indicating whether the industry had a separate telecommunications regulatory agency not directly under the control of the ministry (1= yes, a separate regulator is established, 0= no, a separate regulator is not established). Whether telecommunications operations and regulatory functions are separate is likely associated with propensity to undertake regulatory reform.

Measures for both competition and regulation were developed using cross-sectional data, yet are judged not too inappropriate for dynamic modeling of privatization in this sample.[30]

Prior studies have confounded competition and regulation in using the telecommunications, banking or electric utility industry a sector dummy to indicate noncompetitive and highly regulated industry environments (Boubakri & Cosset, 1998; Megginson et al 1994; D'Souza & Megginson, 1999). These sectors showed "the most intriguing results" with significantly greater privatization performance improvements, yet the authors recognize their dataset to be inadequate to determine whether de-regulation, technological change, or privatization are the driving factors (D'Souza & Megginson, 1999:1426). In our study, the data structure allowed us to control for aspects of competition and regulation, as well as industry technological change (i.e., indirectly, in part, using a temporal variable), in an attempt to isolate both privatization ownership and network governance effects overtime.

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new ventures in emerging sectors, etc.). For our sample, more traditional measures of market concentration would be less useful due to restriction of range. Given the concentrated industry structure a contestable markets measure would suffice. In addition, a primary focus in our study is to examine the relative effects of privatization governance in terms of ownership and hybrid structure. Central aims do not extend to testing which matters most ownership, competition or regulation. These important research objectives were beyond the scope of our study and would require more discriminating scales. For these reasons a basic competition control variable was adequate.

[30] Measures for both competition and regulation were developed using cross-sectional data, reflecting status as of 1997/1998, and are likely to bias upward for earlier transactions (i.e. more competition or regulation measured than perhaps was the case earlier on). However, this bias was not considered too severe given the number of later observations in the sample (mode = 1997, mean = 1994). Furthermore, in the case of telecommunications privatization and regulation in Latin America and Africa (1985-1997), there is some evidence that year of privatization and year an independent regulator was established to be highly correlated (See, summary statistics in Wallsten (2001: 10), for instance). This may suggest that confidence in cross-sectional data on regulation is not too inappropriate for dynamic modeling of privatization in this sample.

Similar to Boubakri and Cosset (1998), developing economy privatization observations were parsed further to control for differential effects on performance among incumbent operators in low- and middle-income economies. Unobserved fixed-effects associated with (1996) middle-income level were measured using a dummy variable (1= lower- or upper-middle income, 0= low-income). Kikeri, Nellis and Shirley (1992 in Boubakri & Cosset, 1998) maintain that a market-friendly policy framework and well-developed regulatory policy are correlated with income.

Dependent variable. Similar to the longitudinal approach used in the Megginson programme (Megginson et al, 1994; Boubakri & Cosset, 1998; D'Souza & Megginson, 1999) annual performance data was obtained for a pre- and post-privatization timeline spanning 6 years, 3 years before (-3, -2, -1) and 3 years after (+1, +2, +3) the privatization transaction event year (0). The only exception was for a limited number of 1998 observations. For these transactions the post-privatization period included the transaction event year; any tests results would likely bias downward (less privatization effects in the event year). Valid data was obtained where at least two data points were present: one annual observation in each of the pre- and post-privatization period.[31] From this annual time series data we calculated a growth metric using mean percentage performance change over the pre-post privatization periods (Δ performance = [average post performance / average pre performance] – 1).

We sought a wide-range of indicator data from the *World Telecommunications Indicators Database* to calculate performance, yet the precise definition of our variable was dictated by data constraints as very few indicators were viable on a cross-country basis. [32] After numerous attempts a valid metric was calculated for "delay", as 'waiting' for fixed-line service provision, industry adjusted for cross-country demand conditions (households).[33] The measure denotes

[31] The Megginson programme requires observations from at least year –2 to 2+, or a minimum of four data points.

[32] Twenty-eight financial and non-financial indicators were extracted to measure performance constructs such as customer service quality, innovation, pricing, investment intensity, profitability, and numerous financial ratios and efficiency measures. These constructs tap performance critical for longer-term operator viability and competitive advantage in the marketplace.

[33] Waiting List for mainlines (in 1000s) was recorded as the number of unmet applications for connection to the public switched telephone network (PSTN) that are held over due to a lack of technical facilities (i.e. equipment, lines, etc.). This indicator refers to registered applications and may not reflect total unmet demand. Waiting was industry-adjusted for cross-country demand characteristics using Households. Households was recorded as the number of housing units consisting of persons who live together or a person living alone; numbers are based on growth rates between censuses. Important exogenous variables that may affect demand and supply for telecommunications services are income per

negative growth as performance improvement (i.e., a rate of reduction for delay in basic telecommunications services). Generally, waiting for basic service provision is recognized as a quality of service indicator (Durant et al., 1998; Ros, 1999), yet our industry-adjusted metric imparts an efficiency interpretation as well. More generally, then, our study examines the efficiency of privatizing fixed-line incumbents by analyzing variations in delay, both an important and relevant measure of privatization performance for this sample.[34] To correct for skewness and mitigate effects of extreme cases a transformed performance variable (power 3) was used in subsequent analysis.

(See, Table 5A, in the appendix for a summary list describing the independent and dependent variables.)

RESULTS

Descriptive statistics

Table 1 presents the descriptive statistics and Table 2 the correlation matrix. Descriptive statistics indicate that, on average, privatization was transacted in years 13/14 and 17 (mean = 13.6, median = 14.5, mode = 17), or the mid- to late-1990s (i.e., 1993/94 and 1997). Incumbent operator context showed: (partial or full) competition was lacking in local, domestic long distance, or international long distance provision of services as monopoly conditions were common (mean = 0.87, median and mode = 0); extant regulation was the norm though many transactions were realized without a separate regulator in place (mean = 0.55, median and mode = 1); and (lower- or upper-) middle income countries presented as typical privatizing administrations (mean = 0.73, median and mode = 1).

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capita, and capital investment and digital switching, respectively (Ros, 1999; Ros & Banerjee, 2000). In our study, demand influence was limited in part in selecting a developing economy sample frame, and further with a middle income control variable; cross-country adjustments for households limit impact of demand conditions as well. Pricing change is an additional factor though recent research on telecommunications privatization using panel data on 23 countries in Latin America showed significant privatization effects even once tariff rebalancing was controlled for (Ros, 2000). Unfortunately, demand-related data on pricing as well supply-related data on investment and switching was missing for observations in this sample.

[34] This metric offers an important measure of privatization performance for this sample. For many developing economies the main drivers of telecommunications privatization are improved service performance, as well as ability to handle expansion; and compared to financial measures, aggregate measures such as quality of service are quite pertinent as privatization restructuring is anticipated in broader systems and structures (Ramamurti, 1996 in De Castro, 1997). Moreover, non-financial performance may serve as a driver of financial performance in the longer term. No attempt is made here to explain PSTN service provision *per se*. Rather the aim is to use improved privatization metrics to capture relative effects on important fixed-line performance with relevance to privatization.

The variables of interest demonstrate that, on average (mean), the State retained 47% ownership, while for new private ownership, 26% involved Telco, 18% involved Investors, and the remainder a combination of Fianancial/Institutional (2.58%), Other Company (2.71%), and Employee/management (2.39%). When Telco, Institutional, and Other Company are re-coded for foreign direct ownership, 31% involved Foreign. For some incumbent operator transactions complex hybrid structures were established (maximum = 6 network ties). However, for most, between one and (nearly) two direct ties were created (mean = 1.67 ties, median and mode = 1 tie), suggesting joint ventures (between an acquiring firm and the privatizing firm or between the acquiring firms themselves) to be common for incumbent operator privatization in developing economies. Also, performance generally improved for this industry though was negatively skewed as some transaction observations showed greatly improved performance (i.e. mode = -9.64, mean = -.84, median = -.29).

Overall, descriptive statistics on key variables point to privatization transaction strategy characterized by non-negligible state ownership residuals, potentially active large-block shareholders introducing joint venture structures as well as more complex consortia, as well as diffused shareholders and differential performance improvements.

Table 1 Descriptive Statistics[a,b]

	Mean	Median	Mode	S.D.	Min	Max
Time[c]	13.6	14.5	17	3.49	1	18
Competition	0.87	0	0	1.10	0	3
Regulation	0.55	1	1	0.5	0	1
Income	0.73	1	1	0.44	0	1
State	47.13	51	51	27.73	0	95.17
Foreign	31.57	34.5	0	25.28	0	94.9
Telco	26.38	27.9	0	24.98	0	94.9
Fin/Institutional	2.58	0	0	7.70	0	40
Other Company	2.71	0	0	7.46	0	40
Employee/Mgmt	2.39	0	0	5.02	0	24
Investors	18.78	14.95	0	18.80	0	68.9
Hybrids	1.67	1	1	1.63	0	6
Delay[c]	-0.84	-0.29	-9.64[d]	1.74	-9.64	0.87

[a] $n = 64$
[b] See Table 5A for summary of variable definitions.
[c] Descriptive statistics are presented for untransformed functional forms of variables Time and Delay.
[d] Multiple modes exist. The smallest value is given.

Correlations

Assessment of the correlation matrix as well as instability of estimates in initial modeling demonstrated some independent variables to be imperfectly correlated. Multicollinearity existed between major large-block shareholders, State and Telco (r = -641, p <.01), thus State and, of course, Foreign (as derived by Telco, Institutional, and Other Company) (r = -.705, p <.01).[35] As a result, we modeled a Foreign blockholder model, using State as the numeraire.[36] Subsequent checks for multicollinearity using variance inflation factors (VIF) indicated multicollinearity posed no serious threat to the validity of the analyses for the models.[37]

Consistent with the hypotheses, the dependent variable, Delay, is significantly correlated with Foreign (-.272, p <.05), as well as with governance form Hybrids (-.423, p <.01), and in the expected direction to indicate performance improvements. Also consistent with the hypotheses, no significant correlation is present for Delay and Investors, diffused shareholdings.

[35] The high correlation between these blockholder types reflects measurement choice and actual incumbent ownership structure in the industry: once ownership on two of three major types was accounted for (either State and Telco, or State and Foreign) along with Investors, the small fraction remaining was split between three negligible shareholder classes (Fianancial/Institutional, Other Company, Employee/management).

[36] Other options included dropping redundant variables, thus, specifying one blockholder model only, where blockholders left out become the baseline comparison, and results interpreted accordingly. Generally, alternative specifications simply make baseline comparisons explicit when assessed unambiguously across alternative models. In the case for Telco and Foreign blockholders separate models were run to distinguish marginal effects, if any, between (foreign) Telco and Foreign (Telco, Institutional, and Other Company). Another option was to combine redundant variables (in a ratio for instance). However, this would be appropriate only if estimates for State and Telco/Foreign were expected to move in the same direction; they were not.

[37] A common threshold for concern for VIF is 5, though some researchers use a factor of 10 as indicating multicollinearity may be influencing the least squared estimates of the regression coefficients.

Table 2 Pearson Correlations[a]

	1	2	3	4	5	6	7	8	9	10	11	12
1.Time[b]												
2.Competition	.006											
3.Regulation	.032	.068										
4.Income	-.220	.222	-.192									
5.State	.252*	-.052	-.012	-.303*								
6.Foreign	.013	-.103	-.208	.130	-.705**							
7.Telco	-.023	-.265*	-.183	.099	-.641**	.898**						
8.Fin/Institutional	.150	.192	-.062	.054	-.033	.189	-.151					
9.Other Co.	-.034	.343**	-.023	.050	-.197	.168	-.164	.110				
10.Employees	-.090	-.057	-.042	.075	-.342**	.024	.043	-.026	-.036			
11.Investors	-.366**	.230	.306*	.253*	-.440**	-.304*	-.268*	-.196	.075	.206		
12.Hybrids	.078	.285*	.145	.337**	-.408**	.459**	.259*	.431**	.235	.169	-.057	
13.Delay[b]	-.153	.020	-.182	-.256*	.350**	-.272*	-.250*	-.066	-.014	-.254*	-.084	-.423**

[a] $n = 64$

[b] Descriptive statistics are presented for untransformed functional forms of variables Time and Delay.

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Regression diagnostics

To ensure stability of the estimates and confidence in the results, the models were empirically checked using standard econometric criteria for assumptions underlying the methodology. Residual variances failed to uncover extant problems with heteroscedasticity or autocorrelation. However, Cook's distance, leverage, standardized predicted values detected certain outliers and influential cases for nine observations in six countries, including Czech Republic, Bahrain, Belize, Hungary, Pakistan, Peru. This was not unexpected as smaller (absolute) sample size carries with it a potential for greater effects of outliers. We judged these observations to indicate drastic and unrepresentative changes in certain transition economies as well as coding difficulties[38], and without practical remedy. As a result, these outliers and influential cases were excluded (Kennedy, 1992).

[38] Drastic and unrepresentative changes in transition economies may have contributed to extreme data for incumbent privatization in the Czech Republic (1998) and Hungary (1996, 1997), while coding difficulties in collapsing units of analysis and transaction dates for Peru (1994, 1996) and Pakistan (1994) may have contributed to measurement error. The Bahrain (1981) transaction was the earliest in the sample and the only observation with pre-performance data from the 1970s, which may have caused unusual influence. It is unclear why Belize (1990, 1991) was an outlier.

Multiple regression analysis

Regression results for the reduced model are presented below in Table 3; the full model is reported in the appendix, in Table 6A. Generally, results remain qualitatively similar for transaction-specific variables between reduced and full samples; where substantive conclusions are affected, these are noted. Results are reported using transformed variables Time and Delay. Similarly, results remain consistent for all transaction-specific variables for equations estimated using nontransformed variables.

Unstandardized regression coefficients are shown, with *t*-values in parentheses. Only Hypothesis 1 does not posit directionality (in either improved or worsened performance), thus a two-tailed test is appropriate. Hypotheses 2 and 3 posit directionality thus one-tailed tests are more suitable. However, to provide uniform reporting across the model two-tailed tests were used. As a result, our tests for Hypotheses 2 and 3, generally, are more conservative.

A word on the controls and overall explanatory power of the model. There are significant effects for Time (p <.01) and Income (p <.10) which suggests improved performance (reduced delay) in more recent privatization transactions and for middle-income developing economies. Competition and regulation were not significant. It is possible our rather coarse measures on these variables may not adequately discriminate variance in performance change. Alternatively, it is plausible that other effects may impact on performance in relatively non-competitive and regulated industry contexts. The model is statistically significant (p <.001) and provides good explanatory power (adjusted R^2 from .270 to .338) for percentage change in performance.

The first hypothesis concerned the inability of share issue privatization as dispersed shareholdings to improve performance in developing economies. Consistent with this prediction, privatization transaction strategy characterized by diffused shareholdings showed no significant percentage change to performance in provision of fixed-line telecommunications services in developing economies.

The second hypothesis predicted privatization strategy characterized by foreign blockholdings to improves performance. The results provide some evidence to support this as significant privatization effects are demonstrated for Foreign large-block shareholdings (p <.10), and the sign of the coefficient indicates that the postulated directionality specifies improved performance change. The negative coefficient for Foreign blockholdings (i.e., multinational

telecommunications operators (Telco), Financial/Institutional investors, and Other Companies) indicates that privatization transaction strategy characterized by sales to foreign strategic investors introduces corporate governance expertise, strong incentives for active monitoring to force restructuring, resulting in reduced delay for basic telecommunications service provision in developing economies (i.e., accelerated service provision). However, when outliers and influential observations are not removed from the model the Foreign blockholder effect does not reach a level of significance to indicate improved performance.

We also modelled two conventional ownership concentration variables, Herfindahl index and Largest owner in alternative specifications to test for general ownership effects (models not reported); these ownership variables did not yield significant parameter estimates, though Hybrid effects remained significant in each model.[39]

The third hypothesis posited privatization strategy characterized by hybrid governance improves performance. The estimation results demonstrate support as significant privatization effects were found for Hybrids (p <.10) and the sign of the coefficients indicate that the postulated directionality specifies an improved change in performance. The negative coefficient indicates that privatization transaction strategy characterized by sales to large-block shareholders introducing larger hybrid governance structures, "hybridness" such as joint ventures with the privatizing firm or between themselves, or complex consortia arrangements, presents an advantage in restructuring specialized assets, resulting in reduced delay for the provision of basic telecommunications services in developing economies.

With the results reported above, the issue of endogeneity is now addressed. We argue that Foreign blockholder improvements to performance were not due to a spurious effect, as understood in the financial economics literature on privatization, where certain large-block shareholders 'improve' performance through informational advantages, private or inside

[39] The Herfindahl index of ownership concentration/dufussion was calculated by summing the squared total percentage of shares held by each new private blockholder type (Telco, Financial/ Institution, and Other Company), and a Largest owner variable computed by identifying the percentage held by the largest single private blockholder within the total percentage held by owners of that type. Both Herfindahl and Largest were highly and significantly correlated with Telco (r =.865, r =.924), and thus, Foreign (r =.865, r =.924), suggesting concentrated ownership to be characteristic of ownership structure for fixed line incumbent telecommunications sectors in developing economies. More important, perhaps, these general concentration measures failed to distinguish ownership effects, being less useful than blockholder type to inform privatization performance improvements in our sample of developing economy operators.

information about the quality of a particular privatizing firm's assets or management, thus are attracted to better quality firms, presenting a spurious relationship between better firms with concentrated ownership and higher performance.

To explore whether Foreign blockholders targeted better performing operators, or alternatively, whether the State held on to poorly performing operators with larger residuals, two alternative specifications were run. In separate models, blockholder variables State and Foreign were regressed on pre-privatization performance, along with the usual controls and other transaction-specific variables, Investors and Hybrids. These tests showed no pre-privatization performance effects for either variables State or Foreign: it is not the case that Foreign acquirers, as such, were able to "cherry-pick" significantly better firms, nor that State administrations retained significant ownership in "lemons". However, Hybrids were significant (p <.001) in both models, and these structures represent new, primarily foreign, large-block shareholdings as observed along a related but distinct transaction dimension. Furthermore, the sign of the coefficients indicates worse pre-privatization performance where Hybrids are subsequently established with incumbent operators, not better performance as the literature on privatization (and foreign direct investment also) suggests. That blockholder hybrid governance may have an advantage when brought to bear on underperforming specialized assets during the privatization process is not inconsistent with conceptual development (and Hypothesis 3) advanced in our study.

Table 3 Effects of Privatization Transaction Strategy on Performance Delay[a,b]

Constant	18270.325	(33.100)***
Control Variables		
Time[b]	-.311	(-3.547)**
Competition	-88.479	(-.645)
Regulation	-152.122	(-.474)
Income	-630.503	(-1.785)†
Transaction-Specific Variables		
Large-Block Shareholdings		
Foreign	-12.473	(-1.915)†
Diffused Shareholdings		
Investors	-5.956	(-.633)
Governance Form		
Hybrids	-213.521	(-1.935)†
Adjusted R^2		.338
F		4.934***
df		7, 54

[a] $n = 55$

[b] Transformed functional forms (power 3) of variables Time and Delay.

Unstandardized regression coefficients are shown, with t-values in parentheses.

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$

All two-tailed tests.

DISCUSSION

Privatization strategy effects

Using a microanalytic perspective from a contractual view of economic organization, our study extends a traditional agency theory approach to include a transaction cost economics framework in examining privatization performance. Relevant learning arguments are also advanced. From this conceptual extension, a novel hypothesis was proposed and tested successfully using a transaction unit of analysis on a larger sample of developing economy fixed-line telecommunications operators. A central finding is that hybrid governance predicts change in privatization performance, and its effects go beyond pure "ownership effects", capturing additional privatization variation, hitherto unexplored in the literature.

More specifically, performance benefits of privatization transaction strategy depend upon not only large foreign blockholdings but also the introduction by these owners of hybrid structures, such as joint ventures or more complex consortia arrangements. Dispersed shareholdings have no impact.

Though Megginson and colleagues (Megginson, Nash, & Van Randenborgh, 1994; D'Souza & Megginson, 1999) find general privatization effects when examining public offerings, the results here suggest otherwise, with dispersed shareholdings having no effect on privatization performance. Subsample results from this research that shows better performance for "control privatization" are more in line with findings in our study.

Samples for the Megginson programme are chiefly drawn from developed economies, where share issue privatization has more relevance. Privatization performance is less certain in developing economies than may be suggested in prior research drawn from a developed economy empirical base. It is unlikely that dispersed privatized ownership, or share issue privatization alone, will be effective in spurring restructuring and performance improvements where capital market development is weak, or other market-supporting institutional frameworks are lacking. While contextual factors as such were not examined directly (beyond controls for competition, regulation, and income), our results are consistent with sample selection criteria and basic aims to verify generalizability of results to a developing economy population, where such institutions are presumed weak. Our findings suggest that where trade sale privatization introduces large-block foreign shareholders and hybrid structures, these strategies achieve improved privatization performance in developing economies. This general conclusion is not inconsistent with Boubakri and Cosset (1998), who find privatization effects for developing economies in a pooled sample of firms privatized through trade sales to one or several investors, public share issues, and those privatized with a combinations of both strategies.

The findings on blockholder effects support recent cross-sectional evidence from the corporate governance literature on voucher privatization in postcommunist transition economies that suggests privatization restructuring and improved performance is contingent upon a fairly active governance system and foreign strategic investors in particular (Makhija & Spiro, 2000; Djankov, 1999; Claessens, 1997). Our results generalize this evidence over time to include other privatization strategies and other developing economy regions.

Our findings document that the effects of privatization on performance, while in some cases significant, are neither automatic nor uniform across different transaction strategies for newly privatized firms in developing economies. Together with evidence reported on transition economies, our study qualifies the general proposition made in the literature that privatization improves performance.

More important still, our research documents numerous and consistent findings by examining privatization implementation strategy longitudinally, dynamically, and directly as an incremental process, using a transaction unit of analysis. Our research design avoids a potential aggregation bias when examining a multi-transaction privatization process indirectly (using temporal variables) and time series performance data with the firm as unit of analysis.

To our knowledge, there are no extant empirical studies examining effects of privatization strategy on performance, directly, at, or near, the firm level. Here privatization transaction strategy was examined along the dimensions of ownership and governance, wherein large-block shareholdings and hybrid structures are identified with trade sale privatization strategy, and diffused shareholdings with share issue privatization strategy.[40]

In this way, the research also answers recent calls in the strategy and organization literature to recognize privatization implementation as an incremental and complex process, comprised of different strategies with unique characteristics, and to examine this process using a multidimensional privatization construct (Zahra, Ireland, Gutierrez, & Hitt, 2000) and a dynamic multilevel model (Ramamurti, 2000) to capture observed yet unexplained performance variance.

Privatization and Corporate Restructuring

Prior theory and empirical research on privatization performance has focused primarily on redistribution of ownership and incentive alignment effects, and more recently, on the importance of large shareholders in facilitating takeover to induce better performance in firms. However, the content of these corporate governance and corporate restructuring constructs has not been specified. Certain studies, however, have looked at the influence of management

[40] Data coding and preparation showed that in most cases blockholdings were the result of direct trade sale by the government to strategic investors, and not to have been the outcome of market-mediated exchange. However, in some cases data was not complete and/or explicit and the possibility remains that eventual consolidation as reported resulted from share issue privatization strategy.

replacement on privatization performance, though with mixed results (D'Souza & Megginson, 1999; Barberis, Boycko, Shleifer & Tsukanova, 1996; Megginson, Nash, and Van Randenborgh, 1994). Neither has the post-privatization internal adjustment processes been systematically explored as this research also has left important organizational issues unexplored (Cuervo & Villalonga, 2000; Villalonga, 2000; Zahra, Ireland, Gutierrez, & Hitt, 2000).

To date, privatization research in finance and economics has placed more emphasis on specifying variance in performance rather than variation in the privatization implementation process itself. Construct validity has been limited to market-for-shares privatization implementation strategies (share issue privatization, as well as voucher privatization), and similarly a market-for-shares mediated post-privatization restructuring process. Largely, our research calls into question the empirical validity of privatization theory based on market-for-shares restructuring mechanisms and private investors, broadly, or at least the generalizability to a developing economy context.

Strategy and organization theorists, however, though recognizing corporate governance as an important area, have neglected ownership as a major organizational variable as well as its role in performance (Kang & Sorensen, 1999). Only recently have researchers in management generally shown interest in privatization theory and empirical research.

Consequently, neither finance and economics nor strategy and organization researchers have articulated the organization transformation process that variations in corporate governance and corporate restructuring presumably induce on privatization performance. A better understanding of major organizational change that follows privatization is likely needed to clarify differential privatization performance outcomes (Cuervo & Villalonga, 2000; Villalonga, 2000; Zahra, Ireland, Gutierrez, & Hitt, 2000).

We advance hybrid governance as a meso-level organizational implication of trade sale privatization and corporate restructuring, to address this shortcoming in the literature. That blockholder hybrid structures predict additional privatization performance improvements is a reasonable finding. Large-shareholder hybrid structures may provide a proxy for actual takeover and subsequent management replacement, signaling likelihood of restructuring, and providing additional predictive power in specifying performance. It is also consistent with arguments that private benefits of control and expropriation risk for performance is lessened

when several large shareholders are present, suggesting some pyramidal group structures to have a positive effect (Wolfenzon, 2000). Such that large-block shareholders and hybrids are distinct yet related concepts based on different sets of assumptions but similar constructs, these findings suggest hybrid structure as an alternative measure for more complex blockholder effects.

In this way, our research contributes to the empirical literature on ownership, generally, in answering calls for better metrics to distinguish the active monitoring potential of blockholders (McConnell & Servaes, 1990), and to theory-building on the importance of large shareholders in facilitating takeover to induce better performance in firms (Shleifer & Vishny, 1986). More important, perhaps, our model also points toward an interplay between "ownership effects", the focus of recent financial economic theory, and (inter-) "firm effects", a major preoccupation of strategy and organization research.

Privatization and Network Governance

That inter-firm networks linking large-block shareholders to the privatizing firm predicts improved performance is reasonable from a network governance perspective as well. This approach draws on transactions costs, knowledge/resource-based views, and social network reasoning to understand patterns of exchange relations and resource flows between independent organizational units (Jones, Hesterly, & Borgatti, 1997).

Hybrid structure as an equity-based inter-firm network with degrees of property-rights sharing suggests a proprietary network form advantageous for interorganizational learning. Privatization strategy introducing larger hybrid structures may offer both economies in safeguarding and advantage in access for privatization restructuring that includes inter-firm knowledge transfer of transaction-specific assets across this network. Specifically, our evidence suggests higher proprietary network density safeguards multiple channels for knowledge transfer.

Theory building by management scholars does suggest a meso network concept to understand corporate privatization strategy (Doh, 2000) and privatization effects relevant for organizational learning (Zahra et al., 2000). Our research operationalizes this notion successfully, and advances new organizational forms in organizational structure rather than more traditional organizational designs. Recent theory-building by strategy and organization scholars and

attempts to explore organizational implications of privatization on performance empirically has shown mixed results (Uhlenbruck & De Castro, 2000; Villalonga, 2000.

Generally, our model is consistent with that proposed by Zahra, Ireland, Gutierrez, and Hitt (2000), with first order privatization effects felt through organizational transformation, such as changes to governance arrangements and organizational structure; these in turn may stimulate second-order effects, such as access to networks, organizational learning, and technological opportunities.

Our evidence also finds support in resource-based arguments for knowledge transfer and technological diffusion in industry-based networks. Nagarajan and Mitchell (1998) propose that firms acquire know-how needed for "encompassing" technology-related changes through equity-based interorganizational arrangements. Our research indicates privatizing firms that acquire multiple proprietary channels for knowledge transfer significantly improve large-scale technological capacity, reducing delay in telephone network service provision, held over due to lack of technical facilities.

Our model also sheds light on why patterns of technological diffusion in the telecommunication industry may vary across countries leading some economies to develop and upgrade their fixed-line service provision substantially faster than others. Though certain empirical work has examined technological diffusion in this industry, studies have been limited to developed economies (Koski & Majumdar, 2000; Majumdar & Venkataraman, 1998), while characteristics of performance variation remain empirically unaddressed, generally, for this sector. Our evidence suggests higher proprietary network density may speed transmission of inter-firm knowledge transfer. Speed or timeliness in privatization restructuring may be critical for incumbent operator performance in the longer term as newly privatized firms face both increased competition by traditional as well as emerging carriers in a rapidly changing market environment and increased technological change in information and communications technology. The results here suggest strategies that introduce hybrid structures to be effective for privatizing operators in developing economies as a fast means of improving fixed-line telecommunications service.

Recall, that in the Megginson programme (D'Souza & Megginson, 1999) the most intriguing subsample results are for telecommunications and electric utilities privatization, documenting

significantly improved performance in these highly regulated and less competitive sectors. The dataset, however, did not allow these authors to determine whether privatization, deregulation, or major technological developments were the driving forces. Our research examines telecommunication privatization exclusively, and controls for aspects of competition and regulation, allowing significant transaction-specific effects to distinguish improved performance for some operators and not others. These and other observations, along with the discussion above offers an understanding of how privatization strategy, through ownership effects and (inter-) firm effects, drives large-scale technological system effects in the telecommunications sectors of developing economies.

Alternative explanations

Framing privatization implementation using a transaction cost approach along with organizational learning arguments offers a plausible conceptual extension for bridging relevant multidisciplinary perspectives on privatization and corporate governance. There are other avenues to pursue, however, including a strategic positioning or merger approach (De Castro & Uhlenbruck, 1997; Uhlenbruck & De Castro, 2000; Doh, 2000). Management theory-building from a strategic behaviour perspective though relevant and likely offers to enrich our understanding of privatization acquisition strategies, neither facilitates conceptual extension with mainstream privatization research in any particular manner nor seeks to bridge new initiatives with prior work. Theory-building and modeling in our research does both, offering novel direction and tractable orientation for future research in privatization, strategy, and organization. A market power argument, and an industrial organization (IO) economics perspective generally, however, may offer an alternative explanation for findings. We take up this issue below.

D'Souza and Megginson (1999) recognize that a difficult-to-refute challenge levelled at privatization studies showing performance improvements is the assertion these improvements may represent nothing other than the exploitation of market power by newly privatized firms, as governments do face real revenue incentive to sell state-owned enterprise as private monopolies as this maximizes the price private investors are willing to pay for shares. Our study does not

examine this question directly, but introduces indirect evidence that the performance gains documented here are not primarily the result of market power exploitation.[41]

Abuse of market power by incumbent operators is typically observed in high prices, insufficient supply, poor service quality and reliability, slow repairs, and slow introduction of new services (Smith & Wellenius, 1999). Tariffs excluded, reductions in delay are not consistent with these indicators. Quite the contrary: significantly reduced delay in unmet applications for connection to the public switched telephone network, held over due to a lack of technical facilities, is a direct measure of service quality, and may suggest better reliability and more repairs, as well. As discussed earlier, price rebalancing may not be problematic (Ros, 2000), and data constraints limited the choice of factors to be examined, such as investment (supply-related factor), switching technology, and financial performance. Furthermore, unlike a financial indicator such as profitability, reducing delay suggests socially beneficial improvements, that many more people in developing economies no longer are deprived of a basic public service, lack of which is often deemed to cause serious economic and social disadvantage.

Regardless of the reason for privatization acquisitions through trade sales, and market power may be one of many, our research demonstrates that "firm effects" discriminate performance within similar industry structures. Specifically, our research models industry performance, a major focus of IO research, and advances inter-firm network structure to distinguish performance variance that other traditional measures of market share and industry concentration would not discriminate in this sample of dominant operators. In effect, our research takes into account influences of firm strategy overlooked in IO research. At the very least, however, our model of privatization transaction strategy and inter-firm hybrid structures may indicate "how" competitive positioning in the industry takes place successfully.

Substitution effects might offer an alternative explanation as well. Substitution between mobile cellular and fixed-link communications take place at several levels (Kelly, 1996). In some parts of the world, and among some parts of the community, there is evidence that mobile phones are

[41] Additionally, the negative coefficients in the models indicate that competition and regulation is associated with better performance (though the relationships are not significant), thus, better privatization outcomes are observed where exercise of market power may be more limited.

substituting for the first fixed-line telephone. It is this potential effect that is likely to have implications for our developing economy sample and performance metric.[42]

The assertion that performance improvements may represent nothing other than potential subscribers dropped from the waiting lists in a shift to alternative telecommunications, specifically, mobile cellular services and networks, is difficult to refute as well. It is possible, however, that many potential subscribers for various reasons may choose not to withdraw current applications for basic telephony even with an intent to or actual shift to emerging services. Despite this reasoning there is other indirect yet compelling evidence to suggest a substitution effect is not problematic for our sample.[43]

As of 1999, 79% of the mobile cellular market was restricted to developed economies only (*ITU World Telecommunications Development Report,* 1999). In many developing economies, mobile has only recently been introduced and some countries still do not have service. This is changing, however. After some increase, the share of worldwide market in mobile cellular services by developing economies accelerated in 1996. In our sample, 50% of the privatization observations took place between 1981 and 1990, prior to this period of growth. Moreover, of the four largest markets in emerging economies, including China, Brazil, Republic of Korea, and Turkey, that account for 12% of worldwide subscribers, only one sample observation is drawn from this group, Brazil (1993). The balance of the mobile cellular market, just 9%, is split between more than 100 remaining developing countries. Nearly our entire sample is drawn from this population, where mobile cellular services and networks have less relevance.

Study limitations and future research

Three limitations of this empirical study that qualify the results discussed above have been mentioned previously: potential idiosyncrasies in this industry-specific research context and heavy sample representation by two regions with implications for privatization transaction

[42] Other substitution effects unlikely to impact are our study refer to the following. At present, the majority of mobile communications users also own a fixed-link telephone. In this case, any substitution which does occur is at the level of traffic flows whereby the consumer chooses which device to use for a particular call. A different type of substitution is the choice of whether to buy a second telephone or a mobile telephone. In countries where fixed-line penetration rate is furthest advanced, ownership of second phones is quite common. Thus, in this area, the substitution effect is at the level of the marginal choice over whether the second device should be fixed-link or mobile.

[43] Additionally, the temporal variable likely captures some unobserved substitution effects over time.

strategy and performance, which limit the specific findings; and the data constraints faced in the choice of performance variables to be examined.

Sample limitations were hardly solvable given extant privatization in telecommunications has occurred in these regions for the time period studied, while the industry-specific research context was a design choice particularly advantageous for examining privatization performance in developing economies.

Though results are limited generally in using a single measure to examine performance variation in newly privatized operators, change in pre- and post-privatization performance was measured objectively and appropriately at the firm-industry level. Moreover, it is encouraging that hypothesized (and consistent) privatization performance effects were captured in any way for transactions occurring in a developing economy context. Empirical research on privatization by other strategy and organization scholars has realized less in these regards (Uhlenbruck & De Castro, 2000).

Notwithstanding, results may be sensitive to the choice of performance indicator, though delay of fixed-line telecommunications service provision due to technical assets (and perhaps technological organization capability) does have relevance for asset specificity arguments advanced here and offers a reasonable indicator for capturing hybrid governance effects.

It is recognized, however, that diffused shareholder incentives may take longer to work than allowed for in a 3-year post-privatization performance window. Similarly, investor effects generally may not impact asset-specific or technology-related performance outcomes in privatization restructuring, and are more appropriately captured in changes to financial performance, for instance. Then again, this interpretation is more in line with theory-building advanced here.

More important, perhaps, is that the change metric for delay did not measure absolute levels of performance, and it is possible that privatization transaction strategy was selected in response to unobserved urgency to restructure. This matter is unlikely to have impacted results since pre- and post-privatization performance was adjusted for ("initial" and ongoing) conditions in cross-country demand, which might be expected to influence need for restructuring.

To these limitations a forth may be added, which is also a product of data constraints, as well as a fifth, with regard to modeling. Both have implications for future research.

Basic design choices were an attempt to limit extant variation across numerous institutional factors, however, it is possible that privatized ownership and governance effects are overstated. Improved measures for competition would be useful in future research, particularly as increased change in market conditions have led to the introduction of new entrants in alternative carriers and new infrastructure in alternative telecommunications network systems. Wallsten (2001), for instance, used a simple competition metric (number of mobile cellular operators) and found competitive effects, which may have lessened privatization effects for incumbent operators in Africa and Latin America and the Caribbean. Also, an avenue for further research would be to investigate whether our results hold for different institutional environments (as measured directly). Programmatic research by La Porta, Lopez-de-Salines, Shleifer and Vishny in the law and finance literature would offer appropriate direction here (see, for instance, La Porta, Lopez-de-Salines, & Shleifer, 1999; La Porta, Lopez-de-Salines, Shleifer and Vishny, 2000).

Data may also overstate some performance improvements, as the research does not account for other firm-specific variables with relevance for asset-specificity and organizational learning. Direct measures for asset specificity (i.e. investment in research and development) would improve this and future research. The notion of "absorptive capacity", which is constituted from abilities to "recognize the value of new information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal 1990: 128), offers one important avenue. Similarly, there is a need to go beyond structural explanations and examine the process of inter-firm knowledge transfer directly, at the resource level. A more extensive treatment on forms of network structures would likely benefit these efforts as well

Finally, it is recognized that in modeling only a foreign blockholder specification evidence cannot be offered as to whether significant outcomes might be the result of more large (foreign) shareholdings or less State ownership, or *vice versa*. A panel study and more advanced econometric techniques rather than traditional multiple regression, too, would improve control for additional dynamic implications of privatization when using longitudinal data, such as contemporaneous change competition, regulation, and, possibility of autocorrelation along the performance timeline.

BIBLIOGRAPHY

Barberis, N., Boycko, M., Shleifer, A., and Tsukanova, N. 1996. How does privatization work? Evidence from the Russian shops. The Journal of Political Economy, volume 104, issue 4, pp. 764-790.

Beamish, P. W. & Banks, J.C. 1987. Equity Joint Ventures and the Theory of the Multinational Enterprise. Journal of International Business Studies, volume 18, issue 2, pp. 1-16.

Bortolotti, B., D'Souza, J., Fantini, M.& Megginson, W. L. 2001. Sources of performance improvement in privatized firms: a clinical study of the global telecommunications industry. Working Paper, pp. 1-49.

Boubakri, N. & Cosset, J-C. 1998. The financial and operating performance of newly privatized firms: evidence from developing countries. The Journal of Finance, 53, pp. 1081-1101.

Boycko, M., Shleifer, A. & Vishny, R. W. 1995. Privatizing Russia. Cambridge, MA: MIT Press.

Boycko, M., Shleifer, A. & Vishny, R. W. 1996. A Theory of privatization. The Economic Journal, 106, pp. 309-319.

Boylaud, O. & Nicoletti, G. 2000. Regulation, market structure and performance in telecommunications. OECD/OCDE. Economics Department Working Papers No. 237, pp. 1-56.

Claessens, S. 1997. Corporate governance and equity prices: evidence from the Czech and Slovak Republics. The Journal of Finance, 52: 1641-1658.

Cuervo, A. & Villalonga, B. 2000. Explaining the variance in the performance effects of privatization. The Academy of Management Review, 25, pp. 581-590.

D'Souza, J. & Megginson, W. L. 1999. The financial and operating performance of privatized firms during the 1990s. The Journal of Finance, 54, pp.1397-1438.

Dansereau, F. & Yammarino, F. J. 1999. Multiple levels of analysis from a longitudinal perspective: some implications for theory building. The Academy of Management Review, volume 24, issue 2, pp. 346-357.

De Castro, J. O. & Uhlenbruck, K. 1997. Characteristics of privatization: evidence from developed, less-developed, and former communist countries. Journal of International Business Studies, volume 28, issue 1, pp. 123-143.

De Castro, J. O. 1997a. Privatizing monopolies: lessons from the telecommunications and transport sectors in Latin America. The Academy of Management Review, 22, pp. 997-1001.

Demsetz, H. & Lehn, K. 1985. The structure of corporate ownership: causes and consequences. Journal of Political Economy, 93, pp. 1155-1177.

Demetz, H. & Villalonga, B. (nd) Ownership structure and corporate performance. Working Paper (H. Demsetz, Dept. of Economics, University of California, Los Angeles, CA, 90095-1477), pp.1-36.

Dharwadkar, R. George, brandes, P. 2000. Privatization in emerging economies: An agency theory perspective. Academy of Management. The Academy of Management Review; Mississippi State; volume 25, issue 3, pp. 650-669.

Djankov, S. 1999. Ownership structure and enterprise restructuring in six newly independent states. Comparative Economic Studies, 41, pp. 75-95.

Doh, J. P. 2000. Entrepreneurial privatization strategies: order of entry and local partner collaboration as sources of competitive advantage. Academy of Management Review, 25, pp. 551-571.

Durant, R. F., Legge, J. S. & Moussios, A. 1998. People, profits and service delivery: lessons from the privatization of British Telecom. American Journal of Political Science, 42, pp. 117-140.

Eckel, C., Eckel, D. & Singal, V. 1997. Privatization and efficiency: industry effects of the sale of British Airways. Journal of Financial Economics, 43, pp. 275-298.

Eisenhardt, K.M., and J.A. Martin. 2000. "Dynamic capabilities: What are they?" Strategic Management Journal, volume 21, pp. 1105-1121.
Fama, E.F. 1980. Agency problems and the theory of the firm," Journal of Political Economy, volume 88, pp. 288-307.
Freeman, L. C. 1979. Centrality in Social Networks: Conceptual Clarification. Social Networks 1:215-39.
Gulati, R. & Gargiulo, M. 1999. Where do interorganizational networks come from? The American Journal of Sociology, volume 104, issue 5, pp.1439-1493.
Gulati, R. & Singh, H. 1998. The architecture of cooperation: managing coordination costs and appropriation concerns in strategic alliances. Administrative Science Quarterly, 43, pp. 781-814.
Henisz, W. J. 1998. The Institutional Environment for International Investment: Safeguarding against State Sector Opportunism and Opportunistic Use of the State. Unpublished dissertation, University of California, Berkeley.
International Telecommunications Union 1998. 1998. General Trends in Telecommunications Reform. Volumes 11, 11, 1V, V, VI. Geneva Swizterland.
International Telecommunications Union 1999. 1999. Trends in Telecommunications Reform: Convergence and regulation. Geneva Switzerland.
International Telecommunications Union 2000. (forthcoming). Trends in Telecommunications Reform: Interconnection Regulation, 3rd edition. Geneva Switzerland.
Jensen, M., and Meckling, W. 1976. Theory of the firm: Managerial behaviour, agency costs and ownership structure," Journal of Financial Economists, volume 3, pp. 305-360.
Jones, C., Hesterly, W. S. & Borgatti, S. P. 1997. A general theory of network governance: exchange conditions and social mechanisms. Academy of Management Review, 22, pp. 911-945.
Jones, S.L.; Megginson, W.L.; Nash, R.C.; Netter, J.M. 1999. Share issue privatization as financial means to political and economic ends, Journal of Financial Economics, volume 53, issue 2, pp. 217-253.
Kang, D. L. & Sorensen, B. 1999. Ownership organization and firm performance. Annual Review of Sociology, 25, pp. 121-144.
International Telecommunication Union. 1999. World Telecommunications Development Report: Mobile Cellular, Geneva, Switzerland.
Kelly, T. 1996. Market forecasting in the telecoms industry, Paper presented for IIR Conference, International Telecommunication Union, Hong Kong, March 11-13th, 1996.
Kikeri, S., Nellis, J., & Shirley, M. 1992. Privatization: The Lessons of Experience, The World Bank, Washington, DC.
Klein, K. J., Dansereau, F. & Hall, R. J. 1994. Levels issues in theory development, data collection, and analysis. Academy of Management Review, 19, pp. 195-220.
Kogut, B. 1988. Joint ventures: theoretical and empirical perspectives. Strategic Management Journal, 9, pp. 319-332.
Kogut, B and Zander, U. 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. Organization Science, 3, pp. 383-97.
Koski, H. A. & Majumdar, S. K. 2000. Convergence in telecommunications infrastructure development in OECD countries. Information Economics and Policy, 12, pp. 111-131.
La Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, R. 2000. Investor protection and corporate governance. Journal of Financial Economics, volume 58, issue ½, pp. 3-27.
La Porta, R., Lopez-de-Silanes, F. & Shleifer, A. 1999. Corporate ownership around the world. The Journal of Finance, 54, pp. 471-509.
Levy, B. and Spiller, P. 1996. Regulation, Institutions and Commitments. Cambridge, Cambridge University Press.

Mahboobi, L. 2001. Recent privatization trends. OECD. Financial Market Trends, Number 79, (June), pp. 43-65.
Majumdar, S. K. & Venkataraman, S. 1998. Network effects and the adoption of new technology: evidence from the U.S. telecommunications industry. Strategic Management Journal, 19, pp. 1045-1062.
Makhija, A. K. & Spiro, M. 2000. Ownership structure as a determinant of firm value: evidence from newly privatized Czech firms. The Financial Review, 41, pp. 1-32.
Martin, S., & Parker, D. 1997. The Impact of Privatization. Ownership and Corporate Performance in the U.K. Routledge, London.
McConnell, J. J. & Servaes, H. 1990. Additional evidence on equity ownership and corporate value. Journal of Financial Economics, 27, pp. 595-612.
Megginson, W. L., Nash, R. C., Netter, J. M. & Poulsen, A. B. 2000. The Choice of private versus public capital markets: evidence from privatizations. Working Paper. (J. M. Netter, Terry College of Business, University of Geogia, Athens GA 30602, pp. 1-23.
Megginson, W. L., Nash, R. C. & Van Randenborgh, M. 1994. The financial & operating performance of newly privatized firms: an international empirical analysis. The Journal of Finance, 49, pp. 403-452.
Megginson, W. L., & Netter, J. M. 1997. equity to the people. The record of privatization by public offers. Privatization Yearbook, London, pp. 27-34.
Mowery, D.C., Oxley, J. E., & Silverman, B. S. 1996. Strategic alliances and interfirm knowledge transfer. Strategic Management Journal, volume 17, pp. 77-91.
Nagarajan, A. & Mitchell, W. 1998. Evolutionary diffusion: internal and external methods used to acquire encompassing, complementary, and incremental technological changes in the lithotripsy industry. Strategic Management Journal, 19, pp. 1063-1077.
Nellis, J. 1999. Time to rethink privatization in transition economies. Finance & Development, volume 36, issue, pp. 16-19.
Newberry, D.M. & Pollitt, M.G. 1997. The restructuring and privatisation of Britain's CEGB--was it worth it? The Journal of Industrial Economics, volume 45, issue 3, pp. 269-303.
Ramamurti, R. 1992. Why are developing countries privatizing? Journal of International Business Studies, 23, pp. 225-248.
Ramamurti, R. (Ed.) 1996. Privatizing Monopolies, Lessons from the Telecommunications and Transport Sectors in Latin America. John Hopkins University Press, Baltimore, MD.
Ramamurti, R. 2000. A multilevel model of privatization in emerging economies. The Academy of Management Review, 25, pp. 525-550.
Ros, A. J. & Banerjee, A. 2000. Telecommunications privatization and tariff rebalancing: evidence from Latin America. Telecommunications Policy, 24, pp. 233-252.
Ros, A. J. 1999. Does ownership or competition Matter? The effects of telecommunications reform on network expansion and efficiency. 1999. Journal of Regulatory Economics, 15, pp. 65-92.
Saunders, R.J., Warford, J.J., Wellenius, B.A. 1995. Telecommunications and Economic Development. World Bank Publications, Johns Hopkins University Press.
Shleifer, A. & Vishny, R. W. 1994. Politicians and firms. The Quarterly Journal of Economics, volume 109, issue 4, pp. 995-1025.
Shleifer, A. & Vishny, R. W. 1986. Large shareholders and corporate control. Journal of Political Economy, 94, pp. 461-488.
Smith, P. L. & Wellenius, B. 1999. Mitigating regulatory risk in telecommunications. Public Policy for the Private Sector, Note Number 189 (July), pp. 1-8.
Sobrero, M. and Schrader, S. 1998. Structuring inter-firm relationships: A meta-analytic approach. Organization Studies, volume 19, issue 4, pp. 585-615.

Spicer, A., McDermott, G. A. & Kogut, B. 2000. Entrepreneurship and privatization in central Europe: the tenuous balance between destruction and creation. Academy of Management Review, 25, pp. 630-649.
Tsang, E.W.K. 2000. Transaction cost and resource-based explanations of joint ventures: A comparison and synthesis. Organization Studies, volume 21, issue 1, pp. 215-242.
Uhlenbruck, K. & De Castro, J. O. 2000. Foreign acquisitions in central and eastern Europe: outcomes of privatization in transitional economies. Academy of Management Journal, 43, pp. 381-402.
Vickers, J. and Yarrow. 1988. Privatization: An Economic Analysis. MIT Press, Cambridge.
Villalonga, B. 2000. Privatization and efficiency: differentiating ownership effects from political, organizational, and dynamic effects. Journal of Economic Behavior and Organization, 42, pp. 43-74.
Wallsten, S. 2001. An econometric analysis of telecom competition, privatization, and regulation in Africa and Latin America. The Journal of Industrial Economics, 59, pp. 1-19.
Williamson, Oliver E. 1975. Markets and Hierarchies: Analysis and Antitrust Implications. New York: The Free Press.
Williamson, O. E. 1985. The Economic Institutions of Capitalism. New York, Free Press.
Williamson, O. E. 1991. Comparative economic organization: the analysis of discrete structural alternatives. Administrative Science Quarterly, 36, pp. 269-296.
Williamson, O.E. 1993. "Calculativeness, trust, and economic organisation," Journal of Law and Economics, volume 36, pp. 453-486.
Williamson, O.E. 1996. "Economic organization: The case for candor," *Academy of Management Review, v*olume 21, issue 1, pp. 48-57.
Wolfenzon, D. 1999. Essays on Corporate Ownership, Unpublished dissertation, Department of Economics, Graduate School of Arts and Sciences, Harvard University.
Zaheer, S., Albert, S. & Zaheer, A. 1999. Time scales and organizational theory. The Academy of Management Review, volume 24, issue 4, pp.725-741.
Zahra, S. A., Ireland, R. D., Gutierrez, I. & Hitt, M. A. 2000. Privatization and entrepreneurial transformation: emerging issues and a future research agenda. The Academy of Management Review, 25, pp. 509-524.

APPENDICES

Table 1A Data Sources

Record	Period	Data Structure
World Bank classification of economies, *World Development Indicators, 1999* CD-ROM, (excel download)	1999 (1996 figures)	Electronic database of income classification for 210 countries (181 members, others with populations > 30,000) based on (1996) GDP per capita Country classification report: Low (<=$785), middle (lower $786-$3,115; upper $3,116-$9,635), high income (>=$9,636) Data source: World Bank, Organisation for Economic Co-operation and Development, United Nations
World Bank *Privatization Database*	1980-1 997	Electronic database of privatization transactions Developing economies, all industry sectors Transaction report: Target company, sector and country, transaction date (year), percentage equity share sold, purchaser, financial notes Data source: Privatization agencies, government sources, economic reports, financial press, World Bank databases,

		staff reports, documents
Thomson Financial Securities Data Corporation, *Mergers and Acquisitions, Share Ownership* databases	January 1, 1984 to October 15, 1999	Electronic database extraction of M&A and share transactions identified with privatization Worldwide, telecommunications sector Transaction report: Target name, target business, target nation; acquirer name, acquirer business, acquirer nation; percentage shares acquired, percentage shares owned after transaction, transaction status (completed, announced, etc.) transaction date (day/month/year) effective Data source: Privatization agencies, government sources, economic reports, financial press
International Telecommunication Union (ITU), *General Trends in Telecommunication Reform Volumes 11-VI (1998)*	1996/97 (1998 verification; 1999 & 2000 abridged updates)	Occasional series on telecommunications sector reform in 189 ITU member states. Series volumes organized into 5 regions: Africa, Americas, Arab States, Asia Pacific, Europe Sector report: 1- to 3-page summary presents contact information for regulatory and policy making bodies; legal instruments; institutional profile (postal and telecom separation; structure of the separate regulator); regulatory issues; ownership (incumbent, others, foreign ownership); market status (degree of liberalization in various segments); future regulatory plans Data source: Occasional questionnaire by Telecommunication Development Bureau, ITU to member state national administrations The ITU is a specialized agency of the United Nations within which governments and the private sector coordinate global telecom networks and services.
Economist Intelligence Unit (EIU), Pyramid Research, *Telecom & Wireless*	190 issues; February 1996 to December 1999	Monthly series market intelligence on strategic sector activity Series issues organized into 5 regions: Latin America, Eastern Europe/CIS, Asia, Africa/Middle East Sector report: 12- to 15-page publication with feature articles and Market Alerts. Market Alerts: 1- to 3-page collection of alerts; privatization or firm-specific notices often reports transacting parties, information on ownership, line of business, and corporate form for investment Data source: government sources, economic and regional reports, financial press, internal databases, EIU consulting reports, documents
International Telecommunication Union, *World Telecommunications Indicators Database, 5th edition* (1999)	Annually, 1975-1999 (year-end) (January 2001 adjustments); and every five years 1960-1970	Electronic database covers over 80 communications statistics Annual time series data for over 200 economies Indicator report: telephone network size and dimension, mobile services, quality of service, traffic, staff, tariffs, revenue and capital investment; selected demographic, macro-economic, broadcasting and information technology statistics Data source: Annual questionnaire by Telecommunication

	Development Bureau, ITU to member state national administrations. Additional data obtained from reports by telecommunication ministries, regulators, operators, ITU staff reports

Table 2A Final Sample of Incumbent Privatization Transactions

Year	Country/Economy	Incumbent Operator
1981	Bahrain	Bahrain Telecommunications Company (BATELCO)
1987	Chile	CTC/Entel
1988	Jamaica	Telecommunications of Jamaica (TOJ)
1988	Maldives	DHIRAAGU
1988	Solomon Islands	Solomon Telekom Company Ltd.
1989	Chile	CTC/Entel
1989	Jamaica	Telecommunications of Jamaica (TOJ)
1990	Argentina	Telecom Argentina/Telefonica de Argentina
1990	Belize	Belize Telecommunications Ltd.
1990	Malaysia	Telecom Malaysia
1990	Mexico	Telefonos de Mexico (TelMex)
1990	Trinidad and Tobago	Telecom Services of Trinidad and Tobago (TSTT)
1991	Barbados	Barbados Telephone Company Ltd.
1991	Belize	Belize Telecommunications Ltd.
1991	Guyana	Guyana Telephone and Telegraph Ltd. (GT&T)
1991	India	Mahanagar Telephone Nigam Ltd. (MTNL)
1991	Jamaica	Telecommunications of Jamaica (TOJ)
1991	Mexico	Telefonos de Mexico (TelMex)
1991	Peru	CPT
1991	Venezuela	Compania Anonima Nacional Telefonos de Venezuela (CANTV)
1992	Argentina	Telecom Argentina/Telefonica de Argentina
1992	Malaysia	Telecom Malaysia
1993	Brazil	Telebras
1993	Estonia	Eesti Telefon
1993	Hungary	Hungarian Telecommunication Co. (MATAV)
1993	Sudan	Sudan Telecommunications Company Ltd. (Sudatel)
1994	Czech Republic	SPT Telecom
1994	India	Mahanagar Telephone Nigam Ltd. (MTNL)
1994	Iran	Telecommunciations Company of Iran
1994	Latvia	Lattelekom
1994	Pakistan	Pakistan Telecommunication Company Ltd. (PTCL)
1994	Peru	CPT/Entel
1995	Armenia	Armentel
1995	Cape Verde	Cabo Verde Telecom Sarl
1995	Chile	CTC/Entel

1995	Czech Republic	SPT Telecom
1995	India	Mahanagar Telephone Nigam Ltd. (MTNL)
1995	Iran	Telecommunciations Company of Iran
1995	Madagascar	Telecom Malagasy (TELMA)
1995	Mongolia	Mongolia Telecommunications Company (MTC)
1995	Tajikistan	Tajiktelecom
1996	Georgia	Georgia Telecom
1996	Guinea	Société des Télécommunications de Guinée (SOTELGUI)
1996	Hungary	Hungarian Telecommunication Co. (MATAV)
1996	Iran	Telecommunciations Company of Iran
1996	Peru	Telefonica del Peru
1996	Venezuela	Compania Anonima Nacional Telefonos de Venezuela (CANTV)
1997	Cote d'Ivoire	Société Côte d'Ivoire-TELECOM (CI-TELECOM)
1997	Hungary	Hungarian Telecommunication Co. (MATAV)
1997	India	Mahanagar Telephone Nigam Ltd. (MTNL)
1997	Kazakhstan	Kazakhtelecom
1997	Kyrgyzstan	Kyrgyztelecom
1997	Pakistan	Pakistan Telecommunication Company Ltd. (PTCL)
1997	Russia	Svyazinvest
1997	Senegal	Société Nationale des Télécommunications du Sénégal (SONATEL)
1997	Sri Lanka	Sri Lanka Telecom Limited (SLTL)
1997	Yugoslavia, Fed. Republic of	Serbija Telecom/PTT Montenegro
1998	Armenia	Armentel
1998	Czech Republic	SPT Telecom
1998	Kazakhstan	Kazakhtelecom
1998	Lithuania	Lietuvos Telekom (Lithuanian Telecom)
1998	Malta	Maltacom p.l.c
1998	Poland	Telekomunikacja Polska S.A. (TP SA)
1998	Romania	Romtelecom

Table 3A Final Sample Regional Distribution

Region	Frequency	Percent
East Asia and Pacific	4	6.3%
East Europe and Central Asia	20	31.3%
Middle East and North Africa	5	7.8%
South Asia	8	12.5%
Sub Saharan Africa	6	9.4%
Latin America and the Caribbean	21	32.8%
	64	100.0%

Table 4A Informed Set of Keywords for the Telecommunications Sector

Shareholder Identity	Shareholding Entities
State	Ministry, office, department; central or privatization agency; privatization, property, pension or social fund
Telco	Telecommunications operator parent corporation, subsidiary, international holding or investment company
Financial/Institutional	Bank, bank holding company; mutual funds, asset or portfolio management; Finance or investment company, and where no telecommunications operator is identified
Other Company	Manufacturing or industrial company; company, holding company; investment or investor group, business group; and where no telecommunications operator or financial institution is identified
Employees/Management	Employees, union, employee stock ownership plan (ESOP); management
Investors	Private or public investors; local or international investors; individuals, citizens, others; or (ownership sale dispersed by) share issue, *tranche*, public offering, American or Global Depository Receipts (ADR, GDR), coupon auction; trading on stock exchange; and where no state entity, telecommunications operator, financial institution, employee/management, or other company owner is identified

Table 5A Variable Definitions

Variable	Description
Time[a]	Number of years between operator transaction event and first sample event.
Competition	Count variable; aggregate of 3 dummy variables for operators in competitive markets for local, domestic long distance, and international long distance. Partially or fully competitive = 1
Regulation	Dummy variable for operators with a separate regulator (yes = 1).
Income	Dummy variable for operators in middle-income countries; Lower-middle or upper-middle income = 1.
State	Total percentage shareholding for operators owned by government, including ownership by agencies, ministries, or other government owned bodies.
Foreign	Total percentage shareholding for operators owned by strategic investors, including Telco, Institutional, or Other Company owners, recorded as no less than partially foreign-based.
Telco	Total percentage shareholding for operators owned by other telecommunications operators, including parent, subsidiary, or holdings companies.
Institutional	Total percentage shareholding for operators owned by financial institutions, including banks, investment companies, or portfolio funds.
Other Company	Total percentage shareholding for operators owned by other companies, recorded as neither telecommunications operators nor financial institutions, including conglomerates/business groups or manufacturers operating in industries other than the telecommunications sector.
Employees	Total percentage shareholding for operators owned by respective operator employees.
Investors	Total percentage shareholding for operators recorded as either widely-held or a residual amount owned by neither State, Telco, Institutional, Other Company, nor Employees.
Hybrids	Count variable; Add 1 tie for each Telco, Institutional, Other Company equity link;

	number of new owner firms (nodes) investing in privatizing firm (node): n nodes – 1 = n ties
Delay [a]	Mean percentage change in performance pre-post transaction event for the ratio Waiting for PSTN connection cross-country industry-adjusted for Households; negative growth demonstrates performance improvement: reduction in delay for basic telecommunications services.

[a] Power (exponential) 3 transformation.

Table 6A Effects of Privatization Transaction Strategy on Performance Delay (*n*=64)

Constant	19493.040	(18.006)***
Control Variables		
Time	-.463	(-2.601)*
Competition	406.415	(1.411)
Regulation	-858.951	(-1.266)
Income	-1373.926	(-1.770)†
Transaction-Specific Variables		
Foreign	-19.614	(-1.382)
Investors	-30.312	(-1.572)
Hybrids	-454.820	(-1.911)†
Adjusted R^2		.268
F		4.288**
Df		7, 63

Transformed functional forms (power 3) of variables Time and Delay.
Unstandardized regression coefficients are shown, with t-values in parentheses.
†p <.10; *p <.05; **p <.01; ***p <.001
All two-tailed tests.

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(xlii) This paper was presented at the International Workshop on "Climate Change and Mediterranean Coastal Systems: Regional Scenarios and Vulnerability Assessment" organised by the Fondazione Eni Enrico Mattei in co-operation with the Istituto Veneto di Scienze, Lettere ed Arti, Venice, December 9-10, 1999.
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(xliv) This paper was presented at the International Workshop on "Green National Accounting in Europe: Comparison of Methods and Experiences" organised by the Fondazione Eni Enrico Mattei within the Concerted Action of Environmental Valuation in Europe (EVE), Milan, March 4-7, 2000
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(xlvi) This paper was presented at the Sixth Meeting of the Coalition Theory Network organised by the Fondazione Eni Enrico Mattei and the CORE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium, January 26-27, 2001
(xlvii) This paper was presented at the RICAMARE Workshop "Socioeconomic Assessments of Climate Change in the Mediterranean: Impact, Adaptation and Mitigation Co-benefits", organised by the Fondazione Eni Enrico Mattei, Milan, February 9-10, 2001
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(lv) This paper was presented at the First Workshop of the Concerted Action on Tradable Emission Permits (CATEP) organised by the Fondazione Eni Enrico Mattei, Venice, Italy, December 3-4, 2001
(lvi) This paper was presented at the ESF EURESCO Conference on Environmental Policy in a Global Economy "The International Dimension of Environmental Policy", organised with the collaboration of the Fondazione Eni Enrico Mattei , Acquafredda di Maratea, October 6-11, 2001
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