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Governance and the City:

An Empirical Exploration into Global Determinants of Urban Performance

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Abstract

We contribute to the field of urban governance and globalization through an empirically-based exploration of determinants of performance of cities. We construct a preliminary worldwide database for cities, containing variables and indicators of globalization (at the country and city level), city governance, city performance (access and quality of infrastructure service delivery), as well as other relevant city characteristics. This city database, encompassing hundreds of cities worldwide, integrates existing data with new data gathered for this research project. We present a very simple conceptual framework and a set of hypotheses, and then test them econometrically. The findings suggest that good governance and globalization (at both the country as well as at the city level) do matter for city-level performance in terms of access and quality of delivery of infrastructure services. We also find that globalization and good city governance are significantly related with each other. There appear to be dynamic pressures from globalization and accountability that result in better performance at the city level. Furthermore, the evidence suggests that there are particular and complex interactions between technology choices, governance and city performance, as well as evidence of a non-linear (u-shaped) relationship between city size and performance, challenging the view that very large cities necessarily exhibit lower performance and pointing to potential agglomeration economies. Our framework also suggests a way of bridging two seemingly competing strands of the literature, namely viewing the city as a *place* or as an *outcome*. We conclude pointing to the need for expanding the database and the econometric framework, as well as to more general future research directions and policy implications emerging from this initial empirical investigation in the field of governance and the city.

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[1] The authors are at the World Bank Institute (WBI). This paper is a preliminary draft, for comment and discussion, and will undergo revisions. The responsibility for the errors and views in this paper are the authors'. We benefited from the valuable assistance of Erin Hoffmann and Fatima Sheikh. The views, data, and research findings aim to further debate and analysis, and do not necessarily reflect official institutional views (or its Board of Directors). The margins of error in any governance, institutional quality and urban dataset imply that interpretative caution is warranted in general, and in particular argue against inferring seemingly precise city or country rankings from the data. For details on data, visit: http://www.worldbank.org/wbi/governance/.

1 Introduction: The empirical challenge

Does globalization at the city and country level matter for sound urban governance? Does sound urban good governance and globalization affect city performance?

While studies on the first question are particularly scarce, some insights into the second question can be found in the existing literature. In particular, there has been an explosion in the literature on globalization and urban management. A simple search on the internet reveals thousands of citations and references on the topic. These range from theoretical explorations such as the work of the "Globalization and World Cities Group" based in Loughborough University, England (GaWC) but also include newsworthy pieces that refer to specific decisions made by cities to position themselves in a global world. The work of Saskia Sassen dominates the citations on the subject of globalization and cities, and a number of sites dedicate themselves to organizing the literature and the data on globalization with some reference to cities, such as the work of the "Transnationalism Project" of the University of Chicago. The most used terminology to refer to globalization of cities is the term "networked", followed by the word "flows", both of which appear in the vast majority of the internet searches. However, the reference to globalization in the sense of world cities appears in only 3% of the references—and even much sparser are references to governance.

The virtual absence of data and empirically based treatment of the subject is particularly striking. A search of the empirical literature on globalization and urban governance suggests a significant gap, largely due to limited comparable cross-city data. This is particularly the case on governance and globalization issues, where an internet-based search elicits very few empirically-based entries. Researchers have in fact lamented the difficulty of getting reliable comparative data to analyze the issues related to globalization of cities (see Short et al (1996) and Knox P.L. (2002)).

But does the data at our disposal permit even an initial exploration into those issues at the city level? If so, is there significant variation in city-level performance, governance and globalization—even within countries? Are differences across cities significant enough to warrant this line of empirical inquiry? And even if they are, do these differences matter? Within this initial empirical exploration, we try to address these issues. We find that the cross-city variance worldwide is rather substantial; and in fact even within countries such intra-city variance is not small—in general the extent of within-country cross-city variance is above one-half the cross-country variation. Such apparent rich diversity of experiences and performance across cities is worth reviewing, and thus exploring the potential determinants of the variation in performance is warranted.

Consequently, in this paper we try to contribute to the field of urban governance and globalization through an empirically-based exploration of some key determinants of the performance of cities. This empirical inquiry is made possible through the construction of a worldwide database for cities that contains variables and indicators of globalization (at the country and city level), of city governance, and of city performance (access and quality

of service delivery). This city database integrates existing data with new data gathered specifically for this research project.[2]

The paper is organized as follows. Section 2 provides a discussion of conceptual and definitional issues on city globalization, providing a partial survey of the literature. In Section 3 we discuss the issue of urban governance in the context of globalization and review some of the relevant literature to capture the dynamics of city performance. Section 4 provides the simple hypotheses on the globalization and governance nexus in explaining city-level performance in terms of service delivery, includes a working definition of urban governance, and presents the simple model specification and hypotheses to be tested. Section 4 also describes the extended city level dataset we have compiled, comprising data on 412 cities in 134 countries, from which we make use of over 35 variables.[3] In this section we also present in brief the results, both in terms of simple summary charts synthesizing the uncontrolled correlations, as well as the econometric specifications and the synthesis of the econometric results of the determinants of city performance. Given the extensive set of variables in the dataset, and multiple econometric specifications we present synthesis tables and graphs summarizing the main econometric results.

In Section 5 we present the results of the preliminary empirical investigation of the potential determinants of city governance, while in Section 6 we discuss in some more detail the results on specific city variables (other than governance and globalization, that are analyzed in earlier sections), such as the characteristics of cities (in terms of size, location, capital status, etc.), the role of technology, and scale effects. Future research questions are dealt with in the concluding section, where we also present emerging policy implications from this analysis.

2 City Performance in the Context of Globalization

There are two main threads in the literature that treat the subject of globalization of cities, which mostly refer to the term "world city" to describe the phenomenon. We take the theoretical underpinnings of this definition from the work of Doel and Hubbard (2002), who clarify key definitions and develop the conceptualization of globalization of cities. The two conceptualizations of world cities that we draw from include the following definitions:

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[2] See Annex D for the list of cities in the current version of the database. We use various sources of data for this analysis, detailed in the Annex. First, a comprehensive city level data set is taken from the UN Urban Observatory which has data on 232 cities in 114 countries for the year 1998. We refer to this database as the UN database. We also use data from the GaWC research which we call the Taylor database, which includes a roster of 265 cities constructed from data on the number of firms (advertising, accounting, banking, and law) and number of practitioners/offices in 265 cities for the year 2000. We construct a special database which we refer to as the KLM (Kaufmann, Léautier, Mastruzzi) database which includes data in 412 cities from 134 countries for the year 2003, based in large part from a worldwide enterprise survey (EOS). This database consists of 36 variables of governance as well as city and country economic data.

[3] The expanded city level dataset includes over a hundred variables. However, since part of this consolidated dataset is aggregated from different existing data sources comprising a different set of cities, the consolidated dataset contains many missing values. One of the objectives for the future is to build up this city level dataset and fill in these data gaps.

1. Globalized City as a *place:* a city is a location within the world, defined with precise city boundaries, but plugged into a global space of flows such as foreign direct investment that comes along with the decisions companies make to locate in particular cities, as well as the flow of people who come to work for these companies in terms of personnel in the country or key people visiting for business purposes, and in the flow of goods and services that are produced by these companies as they decide to locate in a particular city. In such a definition, a global city would get value out of its indigenous characteristics such as its past investments in critical infrastructure and the quality of its institutions. But in particular such a city would also get benefits from the decisions of companies to locate in that city and conduct economic activities such as banking, finance, accounting, legal, or advertising. Urban politicians and managers would be concerned about bringing local value to their citizens, reacting to events that impact the city on a global scale, and creating strategies to adapt the city to best advantage. They would therefore be seeking out to attract such companies or make sure they stay in the city, providing the key inputs and incentives such firms and their related personnel would need.

2. Globalized City as a sustained achievement of *performances* whether measured as the quality of services a city provides to its citizens (access to telephone services, water, sewerage, or electricity), the reliability of such services over time (such as measured by the quality of infrastructure services), and the degree to which a city involves its citizens in decision-making, is responsive to their demands, and the way it is governed in general. Such a city would have relationships with other cities and key players in the global economy such as people, firms, and organizations that are distributed, with varying degrees of clustering and dispersion across the world-city network.

The first definition of a globalized city refers to cities which have a leadership role at the international scale, are externally oriented towards a global economy, have a high ranking in the world's urban hierarchy, or serve as a major gateway for migration. Such cities have existed as far back as the sixteenth century. Knox (2002) highlights the fact that there has been a shifting of the position that cities have had in the world, when you look at how they have organized trade or geopolitical strategies beyond their boundaries. Cities like London, Amsterdam, Antwerp, Genoa, Lisbon, and Venice were key global players in the seventeenth century. In the eighteenth century cities like Paris, Rome, and Vienna became main players in the world, while Antwerp and Genoa lost influence. In the nineteenth century Venice lost some of its influence while cities like Berlin, New York, and St. Petersburg joined the league of world cities. The shifting in and out of global influence, demonstrated by the example of a city such as Genoa, however, supports the second definition of a globalized city, as an outcome of decisions made by firms and individuals, which we wish to explore. We would like to investigate empirically what determines the staying power of cities in their performance on a global scale, and whether governance has anything to do it.

Empirical analyses that have been done using the first definition of a globalized city—a city as a place interacting with the global space—have included a number of indicators such as the seven defined by Friedman (1986): (a) the financial assets of a city such as its capital and equity markets; (b) a city's endowment of key infrastructure which firms and citizens would respond to in terms of their decisions to locate there, exit to alternative options, or push to get governance reforms that would allow them to receive improved services;[4] (c) the size of the city in terms of its population with the assumption that benefits of agglomeration are important; (d) the availability and concentration of key business services and advanced producer services such as credit rating, risk management, and multi-jurisdictional law; (e) the importance of a city's manufacturing output; (f) how many Transnational Corporations have located their headquarters in a city; and (g) the presence of international institutions in the city.

Other authors have used indicators such as the presence of internet domain names (Townsend, 2001); the extent of public-private partnerships (Kresl, 1995); measures of cultural vitality (Smith and Timberlake, 1995); the proportion of foreign residents in the city (Doel and Hubbard, 2002); and the numbers of service sector employees in the city (Doel and Hubbard, 2002).

Very few authors have carried out empirical investigation using the second definition of globalized cities, which considers scale (size of a city, size of its economy including the size of private sector activity) or services (access to infrastructure and social services) as something produced rather than given, requiring cities to constantly perform to remain influential in a global world. New literature which focuses on connectivity of cities within a network includes that of Sassen, (2000), Castells, (2000), and Doel and Hubbard (2002). Uncovering the variables that drive the dynamics of city growth and performance interests us, and we particularly look at the role of governance, using a set of empirical tests.

From the data we have been able to gather from various sources, we can look at the effect of both the scale issue as well as the quality of services and investigate the Friedman (1986) and Townsend (2001) hypotheses.[5]

In latter sections, we develop and implement a simple framework to study empirically the potential determinants of urban performance, within which globalization is hypothesized to be an important factor. From that perspective, we are to view the two definitions of a

[4] Kyu Sik Lee and Alex Anas in "The Benefits of Alternative Power Tariffs for Nigeria and Indonesia" (1996), demonstrate how companies locate in a city and if they do not find the services they need either invest in their own generation, thereby exiting the system, or put pressure to get better services, with potential improvements in local governance, or relocate to cities with better services.

[5] The Taylor database gives us data on financial/banking companies located in a city, as well as data on the availability of key companies in law, accounting, and advertising, all measures of indicators (a), (d), and (f) in the Friedman (1986) hypothesis. From the UN and KLM databases we get measures of key infrastructure endowments (indicator (b)). City size (indicator (c)) is obtained from the website: http://www.citypopulation.de. We use the Kearney composite measure of globalization for measure (e) and have collected web statistics that show whether a city has a website and if it posts budget information or business information there to capture the Townsend (2001) indicators. The only measure we do not use in our analysis is the presence of international institutions in the city.

globalized city as complementary rather than as alternative hypotheses. Simply, the first definition above of a globalized city (particularly regarding 'companies locate in their cities and conduct economic activities such as banking, finance, accounting, legal, or advertising') is to be seen as a potential input to sound urban performance, while the second definition ('achievement of performances', including service delivery) is to be seen as the output or outcome of various inputs (including whether the city is global or not). In this respect, to avoid a quasi-tautology, we move away from equating the second view with a global city, instead regarding it simply as urban performance outcomes.[6]

We therefore posit the simple view that the two definitions of a global city are not necessarily substitutes or competing with each other, but potentially complementary, the first notion potentially being a determinant of city performance. Such a construction builds on the Tiebout (1956) hypothesis of "voting with your feet" and allows us to accept endogeneity. A city with good performance in terms of amenities it provides to its citizens (schools, health services, parks) attracts more migrant residents who "vote" to locate there. Such cities would therefore grow in size and if size of a city gives it advantage in a global world, the issue of "performance" may have an endogenous component. Similarly with respect to location of firms. The dynamics of such a construct dictate that well performing cities would be well managed and hence even better performing.

3 Urban Governance in the Context of Globalization

3.1 Governance and Globalization at the Country level: basic definitions

In the recent past, much work has been done on globalization and on governance at the country level. While this is not the main focus of the paper (and thus we do not provide a literature review), it is of relevance to briefly review the notions of governance and globalization at the country level for two reasons. First, as background to these same twin notions, but at the city level, which will be covered in more detail. And second, because country level variables may also obviously matter significantly as determinants of city-level performance.

We have defined country-level governance as the exercise of authority through formal and informal traditions and institutions for the common good, thus encompassing: (1) the process of selecting, monitoring, and replacing governments; (2) the capacity to formulate and implement sound policies and deliver public services, and (3) the respect of citizens and the state for the institutions that govern economic and social interactions among them. The three dimensions in this definition of governance are then further unbundled to comprise two measurable concepts per dimension, for a total of six components: (1) *voice*

[6] In the Popperian falsifiability sense, taking the second definition of global city as is would not be very useful to test the hypothesis that global cities perform better. Thus, we obviate such a problem by interpreting the first definition as a potential input and the second definition as an outcome (to be empirically tested).

and external accountability (i.e., the government's preparedness to be externally accountable through citizen feedback and democratic institutions, and a competitive press); and also (2) *political stability and lack of violence, crime, and terrorism*. Then (3) *government effectiveness* (including quality of policymaking, bureaucracy, and public service delivery); (4) *lack of regulatory burden*; and, finally, (5) *rule of law* (protection of property rights, judiciary independence, and so on); and (6) *control of corruption*. These components are subject to empirical measurement at the country level, for which a worldwide dataset has been constructed.[7]

3.2 Defining Urban Governance

Despite the fewer numbers of citations that can be found in the literature search which give access to specific empirical data sets that are comparable, there is no lack of citations on the definition and use of the term "urban governance". In simple terms, UNESCO defines urban governance as the processes that steer and take into account the various links between stakeholders, local authorities and citizens. It involves bottom-up and top-down strategies to favor active participation of communities concerned, negotiation among actors, transparent decision-making mechanisms, and innovation in strategies of urban management policies.[8] More comprehensively, one can find definitions of urban governance, as well as descriptions of potential indicators of urban governance in the work of Mehta (1998) and the UNCHS (1999).

Mehta (1998) looks at urban governance through a set of attributes. He introduces the attribute of *accountability* which he suggests is derived from how cities manage their finances, communicate on use of funds and achievements to their citizens, and adhere to legal requirements and administrative policies. Embedded in Mehta's concept of accountability is the question of *responsiveness*, which includes the ability of a decentralized entity to determine and respond to the needs of its constituents. In doing so, city officials need to have processes of citizen *participation*, and a system for monitoring and evaluation, as well as reporting on results achieved. These three measures are critical if one is using the definition of a city as a place, where it is performing with respect to local issues, and managing the consequences of globalization locally.

If we consider the other definition of a globalized city, as an outcome of globalization but also shaping its role within a globalized world then we need to look at dynamic indicators of governance. In addition to the static attributes of accountability, responsiveness, and participation, Mehta also includes a dynamic concept of urban governance which he calls *management innovation*, which measures the degree to which urban managers have been able to successfully implement changes in their systems of administration to achieve superior performance. Mehta introduces three measures which relate to the ability of cities to transform global opportunities to local value. These include measures such as public-private partnerships, local government-citizen interaction, and networking.

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[7] See Kaufmann, Kraay, Mastruzzi, *Governance Matters III: Governance Indicators for 1996–2002*, World Bank Policy Research Working Paper 3106.

[8] http://www.unesco.org/most/most2.htm

The ability of cities to engage in public-private partnerships is seen as a key capability for staying power in a global scene by a number of authors (see Doel and Hubbard (2002) and Knox (2002)). Mehta suggests measures such as presence of business sector initiatives to improve efficiency of local government functioning, as well as the degree to which implementation of policies and incentive schemes exist to encourage private sector participation in development. Linking back to the literature on global cities, such indicators would be relevant due to the consideration that strategic decisions by Transnational Corporations to operate in a given city are based on their determination of the advantages of locating there and would therefore depend on the quality of engagement with the local government in key areas as well as the local investment climate they would face.

Having city governments interact with citizens and non-governmental organizations, opens up the space for introducing the global civil society in decision-making at the local level. Cities with a large diaspora that is actively involved in local decisions are one example but so are the networks of civil society that interact on a global scale with respect to local issues (see Sassen (2002)).

Mehta's definition of urban governance also allows us to introduce the concept of *networking* of one city with other cities or with key actors such as firms, labor unions and business associations, but also other states. He suggests a number of indicators of networking such as the number of inter-city, regional, and international networks as well as the extent of technological interchange and collaboration. Other measures suggested are the exchange between cities of expertise and training. The recent example of the city of Rome sending experts to Kigali, indicates the extent to which this indicator is relevant.

Urban governance as an outcome that is visible to a citizen is a key feature that allows empirical tests of the city as a place or as a sustained achievement of performances. There are very few existing indicators that can be used to capture dynamic changes in governance at the city level. We draw on measures defined by authors such as Mehta (1998) and the UNCHS (1999) which include: (1) consumer satisfaction (survey/complaints); (2) openness of procedures for contracts/tenders for municipal services; (3) percentage of population served by services; and (4) access of the public to stages of the policy cycle[9].

With these measures, we construct a vector of urban governance indicators which we use to test the impact of urban governance on city performance. The vector consists of measures of voice and participation and transparency and accountability which we take from the UN database. We also use measures like illegal financing, state capture, bribery in utility, and

[9] The UNCHS Expert Group Meeting on Urban Poverty and Governance Indicators, 29 April to 1 May 1999, Nairobi, Kenya highlights the top twelve indicators of urban governance which include: (1) consumer satisfaction; (2) openness of procedures for contracts/tenders for municipal services; (3) equity in the tax system; (4) sources of local government funding (taxes, user charges, borrowing, central government, international aid); (5) percentage of population served by services; (6) access of public to stages of policy cycle; (7) fairness in enforcing laws; (8) incorporation of excluded groups in the consultation process; (9) clarity of procedures and regulations and responsibilities; (10) existing participatory processes; (11) freedom of the media and existence of local media; and (12) autonomy of financial resources.

bribery in judiciary from the KLM database. Finally, we construct a dynamic indicator of city transparency which uses proxies like, whether a city has a web page, what information is included in the web page, whether the city budget is publicly available on the web or whether companies can register on the web. Note that this indicator captures similar aspects as the one described earlier in Section 2 and attributed to Townsend (2001).

3.3 Defining the Impact of Urban Governance on Globalized Cities

A 'globalized city' as an *enduring performance* is a concept worth testing empirically. We can ask "what aspects of governance give cities this capability to constantly translate the global complexities into an advantage to them which can be seen in the way they treat their citizens (access to services, quality of services); attract firms to invest (public-private partnerships, FDI, firm location); or measures such as maintaining economic growth over several years and increasing the average per capita income of a city's citizens. Doel and Hubbard (2002) suggest that a globalized city is always a work in progress being shaped and managed by firms, states, sectors, and cities. Thus a city which has good governance should be able to perform well and remain in the league of important global cities as well as deliver value to its citizens.

The literature on globalization and urban governance has two schools of thought on the importance of globalization for the performance of cities. There are those who argue that cities can be well performing if they have sufficient spatial agglomeration of know-how and capacity in the city and that a city's international competitiveness is quite different from the concept of an international city (Kresl, 1995 p.54). Their superior performance in delivering local value to their citizens can come from their interaction with the rural hinterland, as well as with cities within the same country. Thus, well governed cities that are not highly globalized would fit in this category, where we would expect that such cities would be well performing because they are well governed rather than because they are globalized.

Others argue that successful cities will be those that are considered world cities, that deliver local value through interpreting and tapping into global opportunities (Doel and Hubbard, 2002). Such cities would be attending to their own position in a global space of flows, and will be well governed not only in local terms but also in global terms. Their ability to remain well performing cities in a globalized world is determined by their constant attention to good governance.

3.4 Capturing the Staying Power of Cities in a Globalized World

Another important consideration is the one of scale. If scale is something produced rather than given (as pointed out by Doel and Hubbard (2002)), then the size of cities is an outcome of contingent encounters between cities, firms, individuals, and sectors (business associations, labor unions etc). Which means that in due course (when sufficient time series data becomes available) one should also aim to gather "emergent governance indicators" which would allow us to look at the changes in governance over time as a result

of globalization.[10] We use a function that allows us to include both city and country level globalization as an input to delivering service performance within a city, as well as globalization as an outcome of good governance. In this manner, governance achievements provide the environment in which cities can perform better and hence tap into global opportunities.

3.5 Capturing the Dynamics of Globalization

Measures that are important to capture both the dynamics of globalization as well as the staying power of cities include concepts of connectivity, flow and traffic which can be measured by indicators defined by Doel and Hubbard (2002) such as volume and direction of flow of people (via international migration); flow of capital (via international banking); flow of products (via import and export); flow of ideas (via broadcasting and the media); and flow of pollution (via dumping policies) or even crime (drugs, human traffic, money laundering). These measures would change over time and it is the direction of change as well as continuity of flows at given levels that defines the staying power of cities. This definition posits the capability of cities to translate complex relationships at various levels into an advantage and this capacity to translate is more rare than the capacity to command or control.

In its most concise definition, globalization "simply refers to the complex of forces that trend toward a single world society. Among these forces are mass communications, commerce, increased ease of travel, the internet, popular culture, and the increasingly widespread use of English as an international language."[11] Globalization has most often been analyzed at the country level. Sources of data and analysis judging country level globalization as a dynamic concept are rare. Some authors use rankings of countries on a number of dimensions of globalization, such as the work of A.T. Kearney (Foreign Policy, 2002) who use a composite index of globalization. This index builds on indicators of trade, finance, personal contact, and information exchange. Using the Kearney data base, we investigate the issue of country level globalization and its impact on city performance, with cities judged on the ability to sustain a track record of services to their citizens.

For globalization at the city level, we utilize data from the GaWC research (Taylor, Walker, 2000), which has city level data constructed from a superposition of networks of accountancy, advertising, banking/finance, insurance, law, and management consultancy firms—business services indicators of Friedman (1986). This data base demonstrates the "unevenness of globalization" when one looks at the concentration of cities by region for example. We refer to this as the Taylor database. With such data, we can pursue the question of why some cities are left behind in globalization.

[10] This would permit, inter alia, to answer questions such as: do cities/countries that have an improving trend in governance also continue to perform better in terms of their degree of globalization and their ability to translate global opportunities into local value or both?, and would the scale of a city be a good measure of such a phenomenon?

[11] http://www.progressiveliving.org

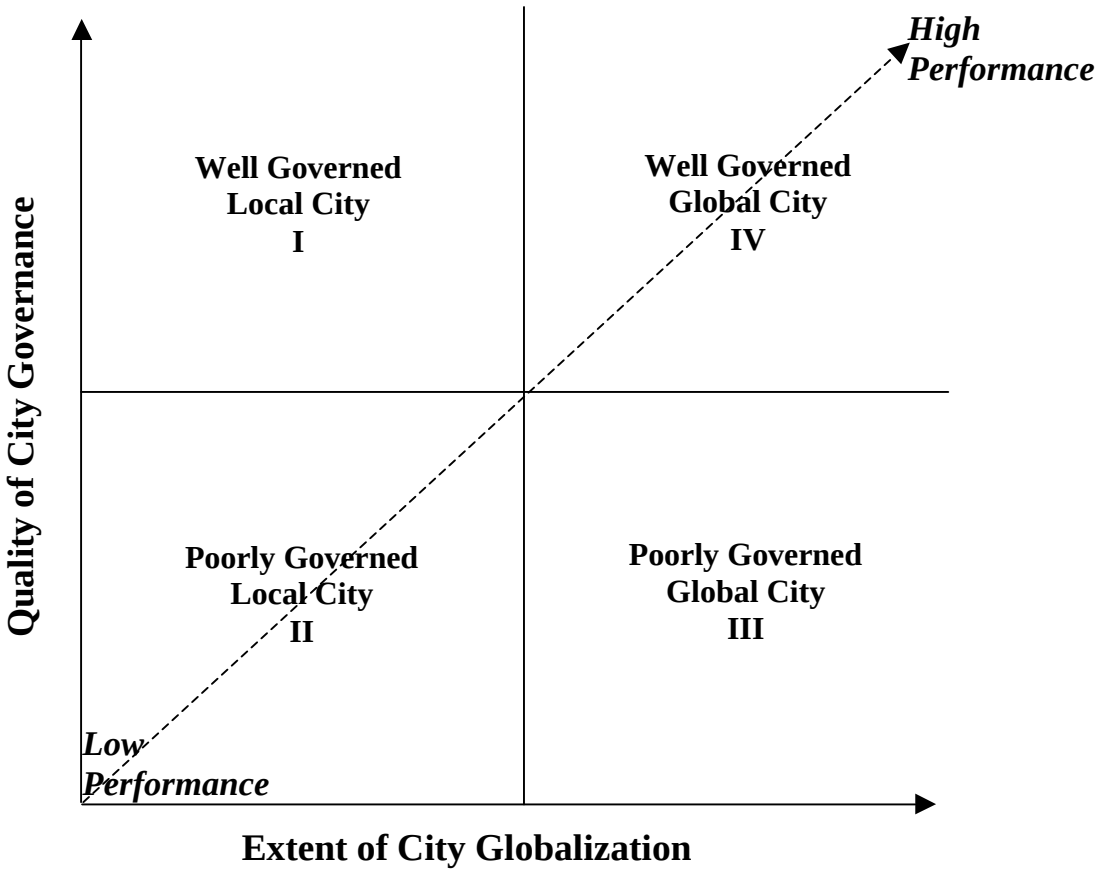
4 Determinants of City Performance: Key Hypothesis Tests and Simple Model Specification

Because of the paucity of comparable data on cities worldwide, we need to be nimble on the model specification we use. We search for a specification that allows us to capture the dynamics of globalization, governance and performance of cities, as well as define specific hypotheses to be tested.

4.1 A Simple Framework

We specifically consider the role that governance plays at different levels of globalization of cities. The schematic chart below allows us to pursue this analysis empirically. We distinguish between three dimensions; two of which are 'inputs' (quality of governance and extent of city globalization, in the vertical and horizontal axis, respectively), and one an outcome (service delivery/city performance, in the 'virtual' third dimension in the chart, illustrated in the chart by the 45 degree diagonal degree line). With such a schematic chart we define the key testable hypotheses on the effects of globalization and governance on city level performance.

Chart 1: City governance and extent of globalization as potential determinants of city performance



Hypotheses to be tested: *Governance and globalization interact, and do matter for city performance.*

Hypothesis 1: *Governance matters.*
We first ask: can a city be well-performing regardless of whether it is a 'local' or 'global' city, significantly driven by its good governance? And, more specifically, would a 'local' city necessarily have to exhibit good governance to 'compensate' and be able perform, i.e. could a city be located in quadrant II and still likely to be well performing?. We posit that, governance matters significantly for city performance, controlling for its level of globalization. While a 'local' city could exceptionally exhibit good performance, this is highly unlikely unless the city exhibits relatively high levels of governance.

Governance in this specification is an endowment that allows a city to perform well either locally or globally. In other words, we can test if a well performing city, whether local or global, has good governance, hence measuring the independent value added of governance to a local city or to a global city. The added value of governance for a local city is then the difference between the performance of a city in Quadrant I compared to one in Quadrant II, while the added value of governance for a global city is the differential performance of a city in Quadrant IV compared to one in Quadrant III.

Hypothesis 2: *Globalization matters.*
We can then also test whether a global city is better performing than a local city, for a given quality of governance (whether for a given level of good governance, i.e. comparing quadrants I and IV, or poor governance, as in quadrants II vs. III, which would measure the independent effect of globalization on city performance). From the literature, it is expected that a city that is global is able to attain such global status because of specific actions taken by its political leadership or by its citizens, as well as the firms that locate within such a city. We would expect citizens of global cities to have better quality and access to services such as water, sewerage, electricity and telephones than local cities.

Hypothesis 3: *Globalization and governance interact positively.*
While in principle it is conceivable that a city could compensate for its 'local' (vs. global) character by exhibiting good governance, in practice the dynamics of good governance may point to a linkage between globalization and governance: those cities that globalize, bring about the checks and balances of competition (say by the discipline imposed by FDI and credit markets), as well as the techniques, that are likely to positively impact on city governance. In turn, improved governance, involving transparency, control of corruption and property rights protection, may attract further demand and pressures for a local city to become more global. [12] Thus, a dynamic virtuous circle may be at play in which

[12] Taylor defines alpha cities as those with global significance in four key global city functions (international accountancy, advertising, banking, and legal services). A beta city is one that has global significance in three of the four key world-city (global city) functions. A gamma city is one that has global significance in two of the four key global city functions. Using the network aspects of the GaWC is a key advantage that we consider in looking at the issue of governance, asking questions like: "Is it that less globalized cities are relatively less well governed and that results in them trailing even further behind?" We group cities into two

globalization and governance interactive positively to further improve performance. In particular, we will empirically investigate whether good governance is less likely in local cities, and thus whether becoming a global city, and a globalized country, helps improve city governance.

Thus, in terms of schematic chart 1, we would expect that the worst performance would take place in cities in quadrant II (poorly governed local city). If it attempts to attain higher levels of globalization, that is unlikely to take place without pressures to take measures to also improve governance. Thus, a rapid and fully horizontal move out of quadrant II to quadrant IV, or a rapid and fully vertical move to quadrant I, are less likely than either the city staying within a low equilibrium trap, or moving out of such a low level quadrant II towards the good performance equilibrium in quadrant III via the diagonal route.

4.2 Simple Model Specification.

A very simple model specification to analyze what emerges from these hypotheses tests is advanced as follows:

$$(1)\quad Y = f(X, Z, c, C) + \varepsilon$$

Y = city performance as measured by a vector of qualitative service variables which include access to water supply, sewerage, electricity, and telephones from the UN dataset, as well as the overall quality of infrastructure services and electricity supply, access to telephones and/or cell phones and access to internet in schools, using the EOS database;

X = measure of globalization at the city level, which we specify using the Taylor dataset as the total number of offices of major international advertising, accounting, and financial firms in a city;

Z = vector of governance indicators, which includes control of corruption, bribery in utility, and state capture, largely drawn from the EOS database;

c = other city characteristics, such as city size, whether it is the capital city, and/or a port, as well as availability of websites and availability of information on city budget and business regulations in such websites;

C=country characteristics, such as income level, size, extent of urbanization, and degree of globalization at the country level, and,
ε = error term.

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categories of “global” and “local” to present some of the results in charts that visually capture the main empirical findings.

4.3 Data description and Mapping of Variables

The KLM database, which integrates existing data with newly collected data and indicators, covering a total of 412 cities in 134 countries, was constructed by drawing from a variety of sources. Each variable we utilize in this paper is listed in Table 1 below. From the UN Observatory (1998), we downloaded 4 service access/performance variables, covering about 80 cities in 60 countries. From the enterprise-specific EOS survey database (2003), we construct city-specific averages for 12 governance indicators, as well as 5 service access/performance variables, covering 271 cities in 101 countries (see Table 1 below for details). For instance, two governance-related variables for which we constructed city-wide averages, were frequency of bribery in utility, and the extent of state capture (from firms' reports on the distortionary impact on competition of illegal payments made by certain firms) to influence government policies, laws or regulations. From the Taylor database, we downloaded the number of offices of major advertising, accounting and financial firms in each city and we constructed a "global city" variable by adding up the three variables, covering a total of 261 cities in 114 countries.

In addition, we also constructed indicators through internet searches, for particular city attributes, such as city population, existence of city websites and availability of data on budget and business regulations in such websites. We completed this list of city attributes by including two dummies for whether the city is the country's capital and/or a port.

At the country level, we draw from the variable "Control of Corruption" from the Worldwide Aggregate Governance Indicators discussed above, where corruption (conventionally defined as the exercise of public power for private gain) is one of its components. The indicator is the aggregate of many individual sources, covering several aspects of corruption, ranging from administrative corruption to "grand corruption" in the political arena and "state capture". We also constructed an income per capita variable (PPP) by drawing from the Heston-Summers database and the CIA World Factbook (2001). For globalization at the country level, we draw from the A.T. Kearney/Foreign Policy Globalization Index. It tracks and assesses changes in four key components of global integration, incorporating such measures as trade and financial flows, movement of people across borders, international telephone traffic, Internet usage, and participation in international treaties and peacekeeping operations. It covers 62 countries, including industrialized and emerging economies.[13] In Table 1 below we present the legend of all the variables we utilize in the empirical testing of these hypotheses, and their sources and characteristics.

[13] Specifically, in this index, economic integration combines data on trade, foreign direct investment (FDI), and portfolio capital flows, as well as investment income payments and receipts. Personal contact tracks international travel and tourism, international telephone traffic, and cross-border remittances and personal transfers (including worker remittances, compensation to employees, and other person-to-person and nongovernmental transfers). Technological connectivity counts the number of Internet users, Internet hosts, and secure servers through which encrypted transactions are carried out. Finally, political engagement tracks each country's memberships in international organizations, personnel and financial contributions to U.N. Security Council missions, ratification of selected multilateral international treaties, and the amount of governmental transfer payments and receipts.

Table 1: Variable Legend and Data Sources

Variable	Description / Source	Range / direction	Coverage	
			Country	Cities
City Variables				
Access to Water	UN Observatory, 1998	%	61	83
Access to Sewerage	UN Observatory, 1998	%	57	78
Access to Electricity	UN Observatory, 1998	%	61	81
Access to Telephone Lines 1	UN Observatory, 1998	%	51	58
Access to Telephone Lines 2	EOS, 2003	1 (bad) - 7 (good)	101	271
Quality of Infrastructure	EOS, 2003	1 (bad) - 7 (good)	101	271
Quality of Electricity	EOS, 2003	1 (bad) - 7 (good)	101	271
Access to Cell Phones	EOS, 2003	1 (bad) - 7 (good)	101	271
Access to Internet in schools	EOS, 2003	1 (bad) - 7 (good)	101	271
Bribery in Utility	EOS, 2003	1 (bad) - 7 (good)	101	271
State Capture	EOS, 2003	1 (bad) - 7 (good)	101	271
Informal Money Laundering	EOS, 2003	1 (bad) - 7 (good)	101	271
Street Crime	EOS, 2003	1 (bad) - 7 (good)	101	271
Red Tape Cost of Imports	EOS, 2003	1 (good) - 9 (bad)	101	271
Bribery to Affect Laws	EOS, 2003	1 (bad) - 7 (good)	101	271
Diversion Public Funds	EOS, 2003	1 (bad) - 7 (good)	101	271
Illegal Party Financing	EOS, 2003	1 (bad) - 7 (good)	101	271
Bribery in Permits	EOS, 2003	1 (bad) - 7 (good)	101	271
Bribery in Tax	EOS, 2003	1 (bad) - 7 (good)	101	271
Soundness of Banks	EOS, 2003	1 (bad) - 7 (good)	101	271
Trust in Politicians	EOS, 2003	1 (bad) - 7 (good)	101	271
Organized Crime	EOS, 2003	1 (bad) - 7 (good)	101	271
Quality of Postal System	EOS, 2003	1 (bad) - 7 (good)	101	271
Health Access Gap	EOS, 2003	1 (bad) - 7 (good)	101	271
Global City	Offices of major advertising, financial & accounting firms (Taylor 2000)	Hundreds	114	261
City Population	Source: www.citypopulation.de, 2001	Logs	134	410
Website Dummy	City has a website (KLM 2003)	0 - 1 (yes)	133	398
Business Dummy	City website has info on how to start a business (KLM 2003)	0 - 1 (yes)	133	398
Budget Dummy	City website has info on city budget (KLM 2003)	0 - 1 (yes)	133	398
Port Dummy	City has port facilities (KLM 2003)	0 - 1 (yes)	134	411
Capital Dummy	City is the capital (KLM 2003)	0 - 1 (yes)	134	411
Country Variables				
Globalization (Kearney)	Journal of Foreign Policy, 2002	0 (close) - 1 (open)	59	254
Control of Corruption	Governance Indicator, KK 2002	-2.5 (bad) / 2.5 (good)	134	411
Country Population	WDI 2003	Logs	134	411
Urbanization	% people not in agriculture (WDI 2002)	%	100	366
Income per Capita	Heston-Summers and CIA World Factbook, 2001	Logs	134	411

4.4 Determinants of City Performance: Main Empirical Results

First we performed a simple univariate, or at most, bivariate, testing of whether globalization and/or governance are highly and significantly related to city performance. In simplified chart form, we first present these results in Figures 1a through 1i, which summarize the initial empirical support for the main hypotheses we test. These figures present the results utilizing only the sample of emerging and transition economies ('non-OECD'), as a simple way of quasi-controlling for large income differentials (indeed, the differences are even larger with the full sample, not depicted in the figures, but shown in subsequent tables below). The figures below present the differential performance that a global (vs. local) city makes on a vector of performance in services such as access to telephones [1][14] (1a), sewerage (1b), water (1c), electricity (1d), overall quality of infrastructure (1e), access to telephones [2] (1f), access to cell phones (1g), access to internet in schools (1h) and quality of electricity supply (1i).

Further, by the simple sample segmentation and calculation performed for each panel of Figure 1, we can also depict here the difference that good governance can make. This is done utilizing three measures of governance, of which one is a country average (control of corruption), and the other two are at the city level (bribery in utility, and state capture).

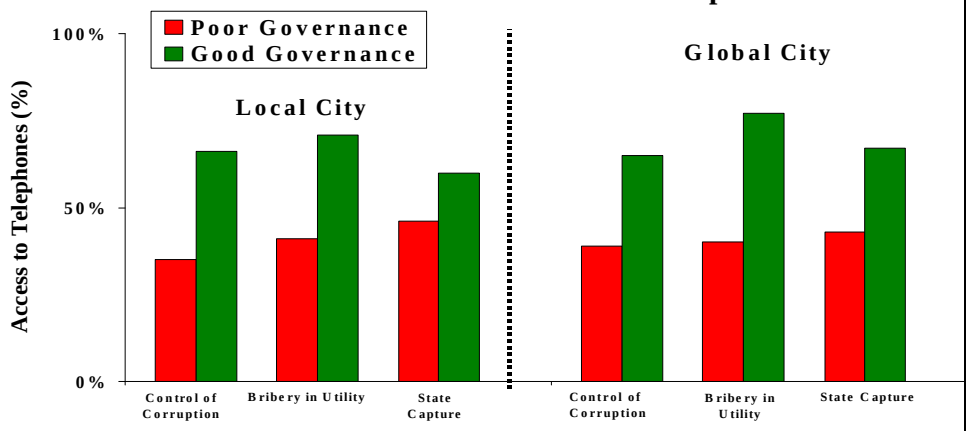
We find that governance is significantly associated with performance, both for local and global cities. Well governed cities, whether local or global, perform better than poorly governed ones across all quality and access to service variables. The performance advantage of well governed cities holds across all three measures of governance and all service variables except access to the electricity grid in global cities.

Globalization has a more nuanced impact on city performance. We find that on balance global cities do perform better than local cities. However, the differences are not that marked, and they vary depending on the type of service. In particular, the difference between local and global cities is clear for certain services, such as quality of infrastructure, yet non-existent for access to electricity, for instance. The rest of the services rate in between such extremes both in terms of magnitude of its impact (often modest) as well as varying levels of significance.

Consistent with the depiction of some of the results in the various panels of Figure 1 above, we present the fuller set of average rating results for all relevant variables in the Table 2 below, for each one of the relevant samples (full sample, OECD, and non-OECD). From tables 2a, 2b, and 2c, we can clearly detect a strong positive correlation between city performance as measured by service access and the extent of globalization (both at city and country level), regardless of sample. Similarly, there appears to be a strong positive correlation between city performance/service access and city and country governance. In conclusion, more globalized cities are better performing, and better governed cities are well performing. Cities in well governed countries are also better performing.

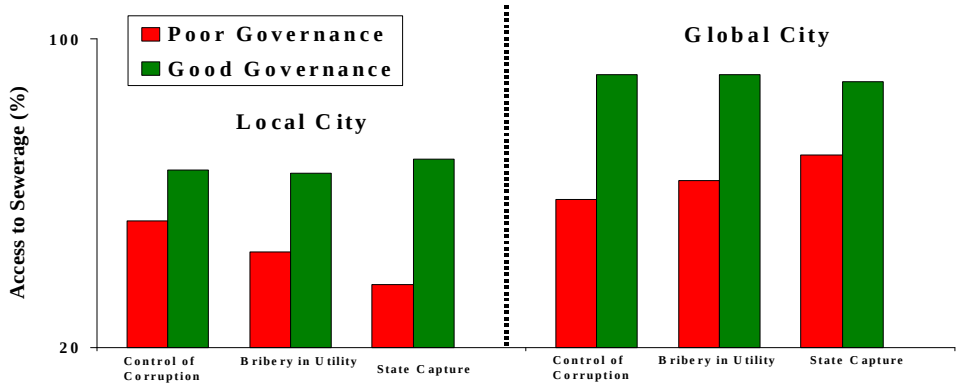
[14] As per table 1, access to telephones [1] is drawn from UN Observatory, 1998 and measures the percentage of the population with access to telephones. Access to telephones [2] is drawn from EOS, 2003 and captures on a scale from 1-7 the availability of new telephone lines for business.

Figure 1a
Access to Telephones (1), City Governance and Globalization – Non OECD Sample



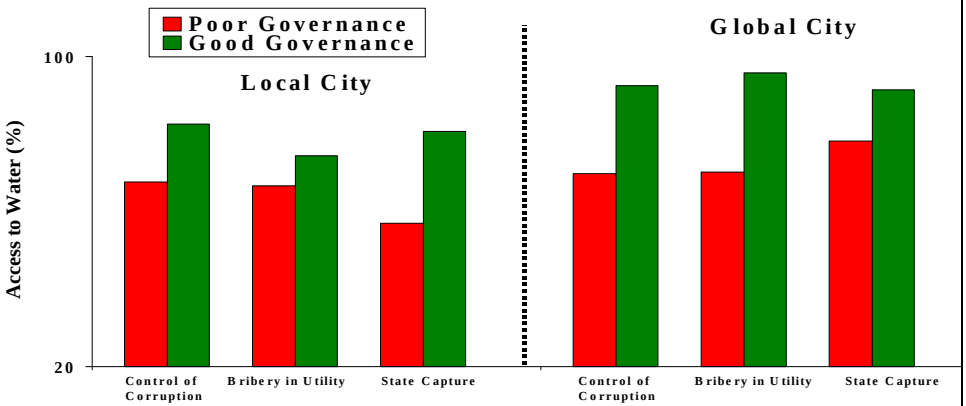
Sources: EOS 2003, UN 1998, KK 2002 & KLM 2004

Figure 1b
Access to Sewerage, City Governance and Globalization – Non OECD Sample



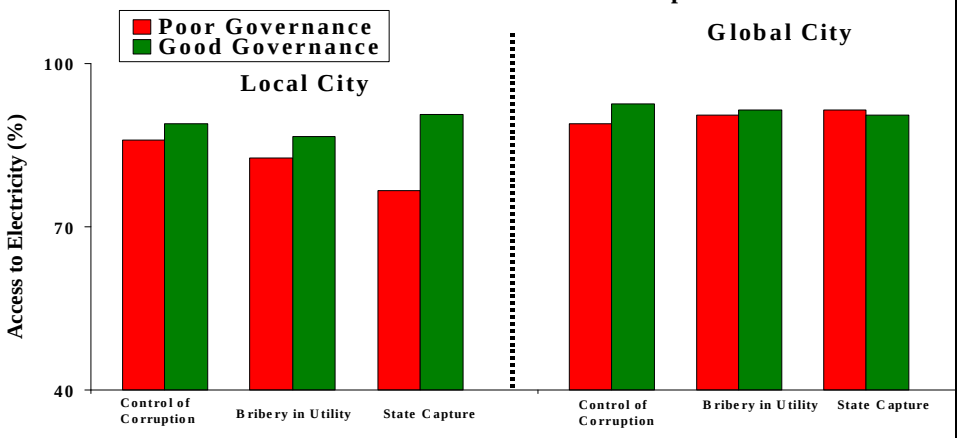
Sources: EOS 2003, UN 1998, KK 2002 & KLM 2004

Figure 1c
Access to Water, City Governance and Globalization – Non OECD Sample



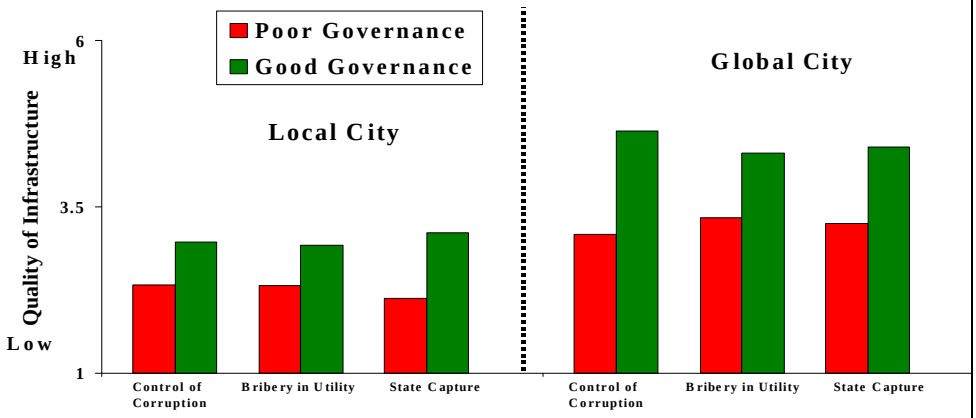
Sources: EOS 2003, UN 1998, KK 2002 & KLM 2004

Figure 1d
Access to Electricity, City Governance and Globalization – Non OECD Sample



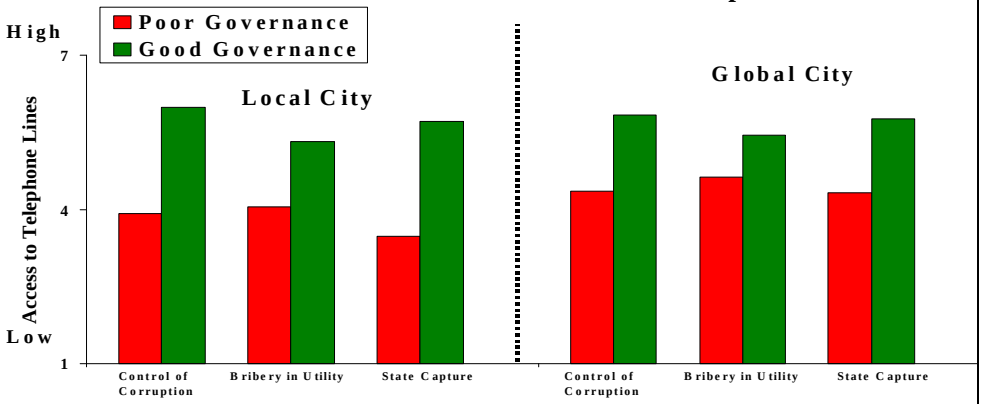
Sources: EOS 2003, UN 1998, KK 2002 & KLM 2004

Figure 1e
Quality of Infrastructure, City Governance and Globalization – Non OECD Sample



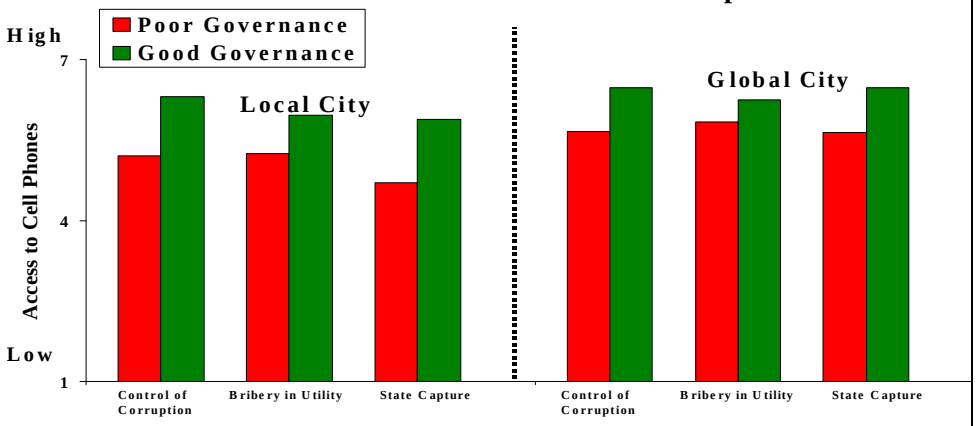
Sources: EOS 2003, KK 2002 & KLM 2004

Figure 1f
Access to Telephones (2), City Governance and Globalization – Non OECD Sample



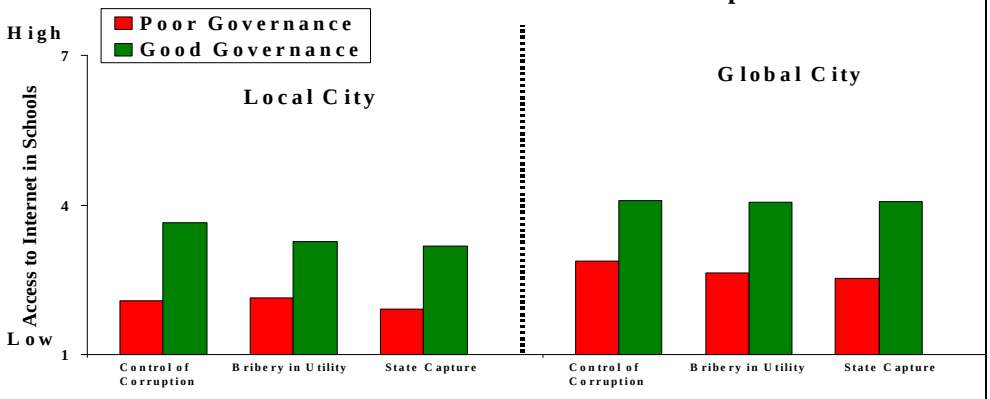
Sources: EOS 2003, KK 2002 & KLM 2004

Figure 1g
Access to Cell Phones, City Governance and Globalization – Non OECD Sample



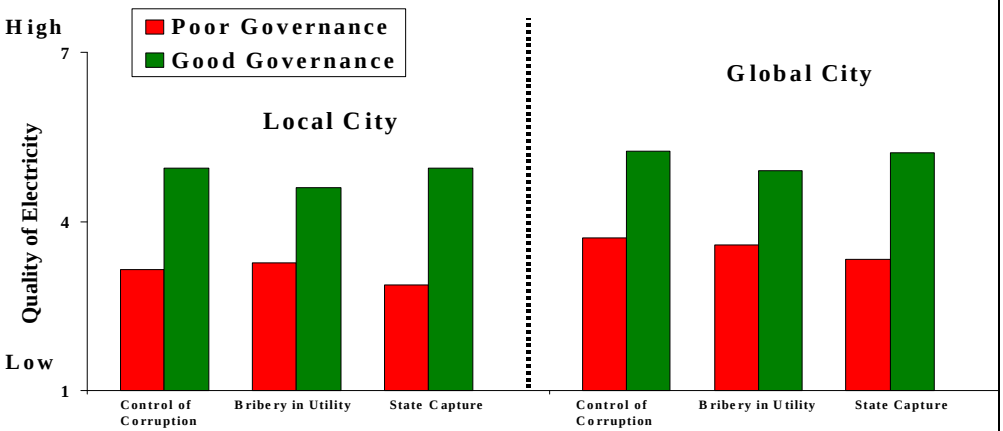
Sources: EOS 2003, KK 2002 & KLM 2004

Figure 1h
Access to Internet in Schools, City Governance and Globalization – Non OECD Sample



Sources: EOS 2003, KK 2002 & KLM 2004

Figure 1i
Quality of Electricity, City Governance and Globalization – Non OECD Sample



Sources: EOS 2003, KK 2002 & KLM 2004

TABLE 2a: City Performance by Levels of Globalization and Governance – Full Sample (412 Cities)

Average Ratings

CITY PERFORMANCE	GLOBALIZATION				GOVERNANCE					
	City Globalization, Taylor 2002		Country Globalization, Kearney		Bribery in Utility EOS 2003		State Capture, EOS 2003		Country Control of Corruption, KK02	
	Low	High	Low	High	Poor	Good	Poor	Good	Poor	Good
Access to Sewerage (%, UN)	62%	94%	75%	99%	55%	91%	60%	89%	62%	95%
Access to Water (%, UN)	75%	95%	81%	100%	68%	96%	72%	94%	73%	98%
Access to Electricity (%, UN)	90%	94%	90%	100%	82%	95%	83%	95%	85%	100%
Access to Telephone lines 1 (%, UN)	46%	80%	60%	95%	37%	79%	41%	80%	40%	89%
Access to telephone lines 2 (1-7, EOS)	4.8	6.0	5.4	6.4	4.4	6.2	4.6	6.0	4.6	6.2
Access to Cellular phones (1-7, EOS)	5.7	6.5	6.1	6.7	5.5	6.5	5.6	6.4	5.6	6.5
Access to Internet in schools (1-7, EOS)	2.9	4.7	3.7	5.3	2.9	4.8	3.0	4.7	2.9	5.0
Quality of Infrastructure (1-7, EOS)	3.1	5.0	3.5	5.5	2.9	4.7	2.9	4.7	2.9	5.0
Quality of Electricity (1-7, EOS)	3.9	5.6	4.4	6.2	3.6	5.7	3.8	5.4	3.7	5.8
Overall Number of Cities	**132**	**129**	**131**	**123**	**137**	**134**	**136**	**135**	**211**	**201**

Note: Each column variable was segmented into two equal samples, below and above the median value of the full sample.

TABLE 2b: City Performance by Levels of Globalization and Governance – Non OECD Sample (274 Cities)

Average Ratings

CITY PERFORMANCE	GLOBALIZATION				GOVERNANCE					
	City Globalization, Taylor 2002		Country Globalization, Kearney		Bribery in Utility EOS 2003		State Capture, EOS 2003		Country Control of Corruption, KK02	
	Low	High	Low	High	Poor	Good	Poor	Good	Poor	Good
Access to Sewerage (%, UN)	57%	72%	71%	79%	50%	87%	51%	82%	56%	72%
Access to Water (%, UN)	74%	79%	78%	85%	64%	93%	66%	88%	70%	81%
Access to Electricity (%, UN)	87%	90%	88%	92%	80%	93%	80%	92%	83%	90%
Access to Telephone lines 1 (%, UN)	43%	57%	48%	76%	32%	74%	38%	64%	37%	59%
Access to telephone lines 2 (1-7, EOS)	4.4	5.1	5.4	5.4	4.2	5.6	4.4	5.4	4.1	5.6
Access to Cellular phones (1-7, EOS)	5.4	6.1	6.2	6.1	5.4	6.2	5.5	6.0	5.4	6.1
Access to Internet in schools (1-7, EOS)	2.4	3.3	3.5	3.9	2.7	4.0	2.8	3.9	2.6	4.1
Quality of Infrastructure (1-7, EOS)	2.6	3.7	3.5	3.4	2.8	3.8	2.7	3.9	2.7	3.8
Quality of Electricity (1-7, EOS)	3.6	4.4	4.2	4.5	3.4	4.8	3.6	4.6	3.4	4.8
Overall Number of Cities	**70**	**65**	**61**	**61**	**102**	**102**	**106**	**98**	**138**	**136**

Note: Each column variable was segmented into two equal samples, below and above the median value of the full sample.

TABLE 2c: City Performance by Levels of Globalization and Governance – OECD Sample (138 Cities)

Average Ratings

CITY PERFORMANCE	GLOBALIZATION				GOVERNANCE					
	City Globalization, Taylor 2002		Country Globalization, Kearney		Bribery in Utility EOS 2003		State Capture, EOS 2003		Country Control of Corruption, KK02	
	Low	High	Low	High	Poor	Good	Poor	Good	Poor	Good
Access to Sewerage (%, UN)	98%	100%	99%	100%	98%	100%	98%	100%	99%	100%
Access to Water (%, UN)	99%	100%	100%	100%	100%	100%	100%	100%	99%	100%
Access to Electricity (%, UN)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Access to Telephone lines 1 (%, UN)	92%	96%	92%	99%	93%	100%	93%	99%	92%	99%
Access to telephone lines 2 (1-7, EOS)	5.9	6.6	6.2	6.7	6.2	6.8	6.2	6.7	6.0	6.8
Access to Cellular phones (1-7, EOS)	6.5	6.7	6.5	6.8	6.5	6.8	6.5	6.8	6.4	6.8
Access to Internet in schools (1-7, EOS)	4.8	5.4	4.8	5.9	5.0	5.6	4.8	5.8	4.5	5.9
Quality of Infrastructure (1-7, EOS)	4.8	5.7	5.1	5.9	4.9	6.1	4.9	6.0	4.6	6.1
Quality of Electricity (1-7, EOS)	5.5	6.3	5.8	6.6	5.8	6.6	5.7	6.7	5.6	6.6
Overall Number of Cities	**64**	**62**	**90**	**42**	**34**	**33**	**34**	**33**	**73**	**65**

Note: Each column variable was segmented into two equal samples, below and above the median value of the full sample.

The significance of the results of the link between governance and city performance is also summarized in Table 3 below, which presents both the magnitude (numerical) and significance (asterisks) of the coefficient of a regression of service performance on governance. As we see in the table, it does suggest the extent to which governance is important when utilizing the full sample, as well as when dissecting whether it matters in particular for local and global cities. We note that the results are large and significant for both local and global cities (with very rare exceptions), further supporting the chart results illustrated in Figures 1a through 1i and Tables 2a, 2b and 2c above.[15]

The results also suggest that these substantial additional benefits of improving governance generally do not differ significantly depending on whether the city is of a global or local nature (as indicated in the table by small magnitudes and lack of significance of the 'difference' row for each service). The exception is the case of control of corruption and access to water and to telephones, which seem more important for local cities than global cities, and bribery in utility and quality of infrastructure and access to internet at schools, which is more important for global cities. These results may hint at the possibility of differential weights on the type of service that matters for local versus global cities. The results for sewerage are also quite high, and could be due to other efforts. More details on the technological and network aspects of services can be found in section 6.

[15] Telephone access in Tables 2a and 2b seems to show overall a higher difference than other services. This may be because telecommunications, which is also a voice enhancing tool, is rather important—a more globalized city with better telecommunications services may offer better opportunities for voice, both local and international, and hence derive more transparency. Such a result has been envisaged by some researchers (see Sassen 2002).

TABLE 3: Governance Effect on Service Performance/Access for Global and Local Cities

SAMPLE	Bribery in Utility	State Capture	Control of Corruption
		ACCESS TO WATER (%)	
Full City Sample	0.11***	0.10***	0.11***
Global City	0.10*	0.04	0.06*
Local City	0.09**	0.10**	0.15***
Differential	**0.01**	**-0.06**	**-0.09***
	Bribery in Utility	**ACCESS TO SEWERAGE (%)** **State Capture**	**Control of Corruption**
Full City Sample	0.15***	0.13***	0.16***
Global City	0.13	0.07	0.08*
Local City	0.13**	0.11	0.21***
Differential	**0.00**	**-0.04**	**-0.13**
	Bribery in Utility	**ACCESS TO ELECTRICITY (%)** **State Capture**	**Control of Corruption**
Full City Sample	0.05**	0.05**	0.05***
Global City	0.05	0.06*	0.06**
Local City	0.05*	0.07*	0.07**
Differential	**0.00**	**-0.01**	**-0.01**
	Bribery in Utility	**ACCESS TO TELEPHONES [1] (%)** **State Capture**	**Control of Corruption**
Full City Sample	0.19***	0.15***	0.24***
Global City	0.17***	0.13**	0.14***
Local City	0.16***	0.09	0.32***
Differential	**0.01**	**0.04**	**-0.18***
	Bribery in Utility	**QUALITY OF INFRASTRUCTURE (1-7)** **State Capture**	**Control of Corruption**
Full City Sample	0.99***	0.98***	1.10***
Global City	0.96***	0.86***	0.99***
Local City	0.57***	0.82***	0.87***
Differential	**0.39*****	**0.04**	**0.12**
	Bribery in Utility	**QUALITY OF ELECTRICITY (1-7)** **State Capture**	**Control of Corruption**
Full City Sample	1.06***	0.92***	1.10***
Global City	1.05***	0.82***	0.99***
Local City	0.80***	0.79***	1.10***
Differential	**0.25**	**0.03**	**-0.11**
	Bribery in Utility	**ACCESS TO TELEPHONES [2] (1-7)** **State Capture**	**Control of Corruption**
Full City Sample	0.87***	0.85***	0.82***
Global City	0.81***	0.53***	0.70***
Local City	0.92***	0.78***	1.10***
Differential	**-0.11**	**-0.25**	**-0.40**
	Bribery in Utility	**ACCESS TO CELL PHONES (1-7)** **State Capture**	**Control of Corruption**
Full City Sample	0.43***	0.35***	0.44***
Global City	0.39***	0.30***	0.34***
Local City	0.35***	0.21*	0.53***
Differential	**0.04**	**0.09**	**-0.19**
	Bribery in Utility	**INTERNET ACCESS AT SCHOOL (1-7)** **State Capture**	**Control of Corruption**
Full City Sample	0.99***	0.93***	1.12***
Global City	0.97***	0.82***	0.98***
Local City	0.64***	0.78***	1.21***
Differential	**0.33***	**0.04**	**-0.23**

Note: Initial sample of 262 cities was divided into two equal samples according to whether the city is global or local. We then ran a set of univariate pooled regressions of service performance/access against selected governance variables(bribery in utility, state capture and control of corruption, as per columns). The results for the magnitude and significance of coefficients for global and local samples are reported in the global city and local city rows, respectively. In each econometric specification, we also included a dummy (for global city=1, local city=0) to identify the two samples as well as an interactive term (dummy * governance) to capture the differential impact of governance on city performance between global and local cities. Last row reports the differential of the coefficients (bolded, with significance levels) along with coefficients on governance variables for full sample and subsets.
Refer also to Annex A for correlation matrix.

We broaden our presentation of the statistical results by summarizing the evidence obtained from the multi-variate econometric specifications, where a fuller set of controls in multiple specifications explaining service performance were included. As per description of the simple model and legend with the variables presented in the previous section, we performed econometric tests through OLS specifications with the various service performance outcomes as dependent variables, and with city characteristics, city and country governance and globalization indicators, as well as country characteristics, as independent variables.

Table 4 below presents the combined synthesis of the results of all econometric specifications. This synthesis presents the magnitude values (+,0,- on the left) and significance (with asterisks, on the right), which we obtain by averaging the magnitude and significance of the regression results of 21 different OLS specifications, for each city performance indicator.[16]

From the implementation of the fuller econometric model, for which the results are summarized in Table 4 above, we obtain a number of salient results. There is an effect of City Globalization on performance using both the Taylor (Global City variable) and the UN (water, electricity, telephone, and sewerage access variables) databases. This effect is relatively modest in some cases yet present, though with varying levels of significance depending on the type of service, controls used, and model specifications. The variable that is most correlated to city globalization (global city (3)) is the quality of electricity.

Other city globalization proxies, such as city web portal with information on steps to start a firm (business dummy), and whether the budget is transparently available on the web (budget dummy), show positive and significant results, but these results are not robust across all service variables. In particular, access to cell phones (as opposed to telephones), and the overall quality of infrastructure are significant, while the other service variables, such as access to water, electricity and sewerage, and to telephone lines show less significance. See Section 6 below for a more detailed treatment of some of the city characteristics and related results. Bribery in utility seems to also be important, showing significant results for all service variables in Table 4.

These econometric results are consistent with and support what was described in the previous figures and tables. Further, it is important to observe differences across services in terms of the importance of globalization on performance. Indeed, the results suggest that

[16] In particular, for each independent variable, for calculating the magnitude of the coefficient rating (left hand side), we computed the product of the average coefficient magnitude across all specifications times twice the standard deviation of the variable. Then we assigned magnitude values according to the following criteria: for positive coefficients, we applied a "++++" for any value above 1.2; "+++" for any value between 0.7 and 1.2; "++" for any value between 0.4 and 0.7 ; "+" for any value between 0.1 and 0.4; and finally a "0"'for any value below 0.1. Similarly, minus signs were applied to negative coefficients. For the rating on the significance of the coefficient in each cell (right hand side), we averaged the various significance levels across the 21 specifications, where "***" indicates significance at 1%, "**" indicates significance at 5%, "*" indicates significance at 10% and ' indicates significance at 15%.

there are differential impacts of globalization on city performance, depending on the options city residents have for exit or choice. In the services where they can exit, such as water and electricity, then globalization has limited impact on city performance. In cases where they cannot exit, there seems to be more impact. The role of voice and participation, when you cannot exit seems to be critical, and significant, as shown by the significance of the variables such as bribery in utility and control of corruption (see Table 4 above).

TABLE 4: DETERMINANTS OF CITY PERFORMANCE – SYNTHESIS OF ECONOMETRIC REGRESSION RESULTS

Source	UN 1998	UN 1998	UN 1998	UN 1998	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003
Dependent Variables	**Access to Water**	**Access to Electricity**	**Access to Sewerage**	**Access to Telephones [1]**	**Access to Telephones [2]**	**Access to Cell Phones**	**Internet Access**	**Quality of Infrastructure**	**Quality of Electricity**
	%	**%**	**%**	**%**	**1-7**	**1-7**	**1-7**	**1-7**	**1-7**
City Variables									
City Population	0 / 0	0 / 0	0 / 0	0 / 0	+ / 0	+ / 0	0 / 0	+ / *	+ / 0
Global City (3)	0 / 0	0 / 0	0 / 0	0 / 0	+ / 0	0 / 0	0 / 0	+ / 0	+ / **
Bribery in Utility	+ / '	0 / '	+ / '	+ / **	++++ / ***	++ / ***	- / 0	++++ / ***	++++ / ***
Business Dummy	0 / 0	0 / 0	0 / 0	+ / *	+ / '	0 / *	0 / 0	+++ / **	++ / **
Website dummy	0 / 0	0 / '	0 / 0	+ / 0	++ / **	+ / **	0 / 0	+ / *	+ / '
Budget Dummy	0 / '	0 / 0	0 / *	0 / 0	+ / *	0 / 0	+ / 0	+ / 0	0 / 0
Port Dummy	- / **	0 / '	0 / 0	- / **	+ / 0	0 / 0	+ / *	0 / **	- / *
Capital Dummy	0 / 0	0 / 0	0 / 0	0 / 0	- / 0	- / 0	+ / ***	- / *	0 / 0
Country Variables									
Country Population	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	++ / **	0 / 0	- / *
Urbanization (%)	+ / '	0 / '	0 / 0	+ / '	+ / 0	+ / 0	0 / *	0 / '	+ / '
Kearney Globalization Index	0 / '	0 / 0	0 / 0	+ / 0	+ / *	+ / *	+ / *	+++ / ***	+++ / ***
Control of Corruption	+ / **	0 / *	+ / '	+ / **	++++ / ***	++ / **	+ / 0	++++ / ***	++++ / ***
Income per capita	+ / ***	+ / **	++ / ***	++ / ***	++++ / ***	+++ / ***	+++ / ***	++++ / ***	++++ / ***
# of cities	**63**	**61**	**59**	**42**	**194**	**194**	**194**	**194**	**194**
Adjusted R-squared	**0.28**	**0.11**	**0.29**	**0.37**	**0.39**	**0.28**	**0.28**	**0.45**	**0.50**

Source: KLM city database, drawing from EOS-WEF 2003 as well as other sources as per below.

Sample size: 412 cities in 134 countries.

Values for magnitude (+,0,-) and significance (*,0,') in each cell were obtained by averaging results of 21 different OLS specifications. In particular, for each independent variable, for calculating the magnitude of the coefficient rating (left hand side), we computed the product of the average coefficient magnitude across all specifications times twice the standard deviation of the variable. Then we assigned magnitude values according to the following criteria: for positive coefficients, we applied a "++++" for any value above 1.2; "+++" for any value between 0.7 and 1.2; "++" for any value between 0.4 and 0.7 ; "+" for any value between 0.1 and 0.4; and finally a "0"'for any value below 0.1. Similarly, minus signs were applied to negative coefficients. For the rating on the significance of the coefficient in each cell (right hand side), we averaged the various significance levels across the 21 specifications, where *** indicates significance at 1%, **" indicates significance at 5%, * indicates significance at 10% and ' indicates significance at 15%.

Values for number of cities and R-square were computed as simple averages across all specifications.

Sources: All dependent variables drawn from UN 1998 and EOS 2003; globalization index downloaded from Foreign Policy Magazine, 2002 (Kearney); country population and urbanization drawn from WDI 2002; city population downloaded from website: www.citypopulation.de ; port, capital, budget and business dummies drawn from KLM 2003; Control of Corruption drawn from KK02; Global city (3) drawn from GAWC (Taylor, 2001); income per capita drawn from Herston-Summers and CIA World Factbook (2001); bribery in Utility drawn from EOS 2003.

Lee and Anas (1996) potently gave an illustration consistent with these results. They analyzed the decisions firms made to locate or not in cities in Nigeria and Indonesia, and also found that where public supply of electricity was unreliable, they could substitute by private generation capacity that they themselves installed. Section 6 provides a more detailed look at both the issue of technology and that of scale and city characteristics.

Country globalization (Kearney Globalization Index) also matters for city level performance. It is significant for all service variables except access to electricity, sewerage and telephone lines. What is interesting in the results in Table 4 is that city performance for network infrastructure (electricity grid, sewerage, telephone lines) is impacted by two aspects of governance (bribery in utility at the city level, control of corruption at the country level) and per capita income. Rich countries can afford to provide network infrastructure in cities. And better control of city and country level corruption leads to better performance of cities in providing access to services.

In summary, we find that there is an effect of city globalization on performance of cities using both the Taylor and the UN databases. While the strength of the effects appears to be somewhat more robust for governance variables than for globalization, it is present for the latter.

5 Determinants of City Governance

5.1 A simple Framework

The dramatic increase in empirical work on governance over the past few years has spearheaded a more in-depth analysis of the manifestations, causes, and consequences of misgovernance and corruption. It has drawn from cross-country data as well as in-country diagnostic perspectives. Significant inroads have been made in unbundling governance to measure and analyze its detailed components, as well as in exploring empirically the governance performance of different institutions—such as parliament, police, and customs.

We use three indicators of governance to investigate the relationship between globalization and governance. The first is an indicator of governance from the political perspective which we represent by an indicator of low illegal party financing. The second is a measure of public sector governance for which we use an indicator on low diversion of public funds. Third, we use an indicator of the effectiveness of public services where we use a measure of trust and performance of the postal system. With these three indicators, we see that globalization is positively related to good governance (Figure 2a).

For city governance we use a measure of whether a city is providing services to its citizens (low health access gap) and whether it has a well functioning public sector with low bribery in taxes or in the provision of utilities. The data shows that, the more urbanized a country is, the better its level of city governance (Figure 2b). This finding is of historical importance as most of what we now practice in the form of country governance was first developed in city states such as in Greece at the time of Plato in the 4th century B.C. or

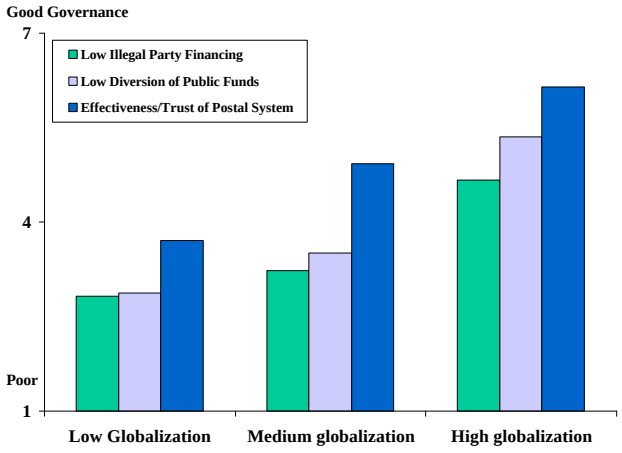
Jericho over 10,000 years ago. As illustrated in Figure 2c, the data suggest that neither city nor country size negatively affect governance at the city level. Furthermore, there is no evidence that a higher degree of urbanization within a country has a detrimental impact on the governance of cities; in fact, for some dimensions the extent of urbanization may have a positive effect.

We find no support for the argument that capital cities are better or worse governed which somewhat contrasts with the empirical importance of the extent of globalization, if we assume that capital cities tend to be more globalized (Figure 2c).

This early exploration suggests that some commonly held beliefs on city-level performance can be empirically challenged—such as the notions that in larger cities performance and governance will suffer due to diseconomies of agglomeration; that port cities, or the country's capital, will generally tend to be more corrupt than other cities; or that urbanization or globalization may bring about mis-governance.

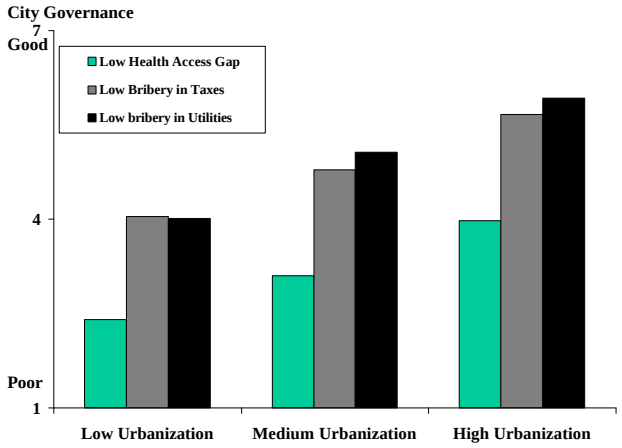
Complementing the stylized results shown in the various panels of Figure 2, we summarize in table 5 below the key average ratings for the governance variables we utilize, against the various potential determinants.

Figure 2a: City governance and globalization



Source: Executive Opinion Survey (2003).

Figure 2b: City governance and urbanization



Source: Executive Opinion Survey (2003).

Figure 2c: City governance and city characteristics

Source: Executive Opinion Survey (2003).

Next we review whether the results we have found are robust across databases and across different definitions of globalization and governance. The results are shown in Table 5 below. Overall, we observe higher levels of governance in global cities, although the magnitude of the differences between local and global cities vary depending on the type of governance variable used. These results are similar irrespective of whether one considers the full sample of 412 cities (shown in table 5 below), or when the samples are segmented into non-OECD and OECD cities (not shown).

TABLE 5: Average governance ratings by multiple city/country factors

		Low Bribery in Utility	Low Informal Money Laundering	Absence of street crime	% Red Tape Cost of Imports	Low Bribery to affect laws	Low Illegal Financing	Low Diversion of Public Funds
		1-7	1-7	1-7	%	1-7	1-7	1-7
Global city (Taylor)	Local	4.39	3.46	3.78	23.8	3.61	3.14	3.06
	Global	5.64	4.46	4.84	14.2	4.76	3.93	4.42
Size ratio city/country	Low	4.95	3.72	4.27	17.4	3.99	3.33	3.44
	High	5.05	4.00	4.32	18.2	4.24	3.53	3.76
City population	Low	5.06	3.85	4.32	16.4	4.11	3.46	3.66
	High	4.94	3.92	4.27	19.7	4.17	3.43	3.59
Capital City	No	5.01	3.85	4.26	17.2	4.14	3.45	3.63
	Yes	4.99	3.92	4.33	19.2	4.11	3.42	3.60
Website has information on how to start business	No	4.90	3.76	4.16	18.5	4.04	3.37	3.50
	Yes	6.19	5.19	5.42	10.7	5.18	4.26	5.02
Kearney Country Globalization Index	Low	4.69	3.58	4.00	20.6	3.90	3.03	3.16
	High	6.21	4.88	5.46	9.6	5.11	4.36	5.04
Country Urbanization	Low	4.40	3.58	3.93	21.5	3.65	3.12	3.10
	High	5.84	4.26	4.77	13.0	4.79	3.88	4.34

All variables range from 1 (bad) to 7 (good) with exception of cost of imports which is shown in percentage terms

The synthesis results of the full set of econometric specifications is presented in table 6 below, and the full regression results appear in Table 4 of the paper. We find that globalization at both city and country level (Kearney Globalization Index) is positively correlated with all the measures of governance. Globalization at a country level, as measured by the Kearney Globalization Index is significant and positive against all the governance indicators, except cost of imports where it is significant and negative. Per capita income is also positively correlated with all dimensions of governance.

The results shown in Table 6 are relatively robust and significant. With some specifications, country level globalization seems to dominate the city globalization variable. Partly this may be the fact that country level globalization in the more fundamental (macroeconomic and trade) sense vis-à-vis the rest of the world is even more important than city-specific measures or city specific attractiveness. Yet in part this result may also reflect the fact that the country globalization variable was constructed specifically for the purpose to have a globalization indicator, while the city globalization variables we are utilizing are indirect (and partial) proxies. Thus, the measurement errors may differ, with the city variables being more (statistically) 'noisy'.

Two proxies for city level globalization which look at cities that have attracted business in finance, accounting, and advertising (global city 3) and those that have a transparent way of allowing firms to set up a business (business dummies) are better governed in all dimensions of governance.

TABLE 6: DETERMINANTS OF CITY GOVERNANCE – SYNTHESIS OF ECONOMETRIC REGRESSION RESULTS

Source	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003
Dependent Variables	**Low Bribery in Utilities**	**Low Informal Money Laundering**	**Low Street Crime**	**Red Tape Cost of Imports**	**Low Bribery to affect laws**	**Low Diversion public funds**	**Low Illegal Party Financing**
	1-7 (good)	**1-7 (good)**	**1-7 (good)**	**1-9 (bad)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**
City Variables							
City Population	+ / '	+ / '	0 / 0	0 / 0	+ / 0	+ / '	0 / 0
Global City (3)	+ / '	++ / ***	+ / '	- / **	++ / **	++ / **	++ / ***
Country city size ratio	+ / '	+ / '	+ / '	0 / 0	+ / '	+ / '	+ / *
Business Dummy	++ / ***	+++ / ***	++ / **	- / '	++ / **	+++ / ***	++ / **
Website dummy	+ / 0	+ / '	+ / 0	0 / 0	+ / 0	+ / '	0 / 0
Budget Dummy	0 / 0	+ / 0	+ / 0	0 / 0	- / 0	0 / 0	0 / 0
Port Dummy	0 / 0	+ / '	+ / 0	0 / 0	0 / 0	+ / '	+ / '
Capital Dummy	0 / 0	- / '	0 / 0	+ / 0	- / 0	- / '	- / '
Country Variables							
Country Population	--- / ***	-- / '	- / 0	++ / '	-- / *	-- / *	--- / **
Urbanization (%)	++ / **	0 / 0	-- / '	0 / *	+ / '	0 / 0	0 / 0
Kearney Globalization Index	++++ / ***	++++ / ***	++++ / ***	--- / ***	+++ / ***	++++ / ***	++++ / ***
Income per capita	++++ / ***	+++ / ***	++++ / ***	---- / ***	++++ / ***	++++ / ***	+++ / ***
# of cities	**193**	**193**	**193**	**193**	**193**	**193**	**193**
Adjusted R-squared	**0.30**	**0.21**	**0.19**	**0.24**	**0.21**	**0.29**	**0.17**

Source: KLM city database, drawing from EOS-WEF 2003 as well as other sources as per below. All dependent variables range from bad to good with exception of costs of imports.

Sample size: 412 cities in 134 countries.

Values for magnitude (+,0,-) and significance (*,0,') in each cell were obtained by averaging results of 21 different OLS specifications. In particular, for each independent variable, for calculating the magnitude of the coefficient rating (left hand side), we computed the product of the average coefficient magnitude across all specifications times twice the standard deviation of the variable. Then we assigned magnitude values according to the following criteria: for positive coefficients, we applied a "++++" for any value above 1.2; "+++" for any value between 0.7 and 1.2; "++" for any value between 0.4 and 0.7 ; "+" for any value between 0.1 and 0.4; and finally a "0"'for any value below 0.1. Similarly, minus signs were applied to negative coefficients. For the rating on the significance of the coefficient in each cell (right hand side), we averaged the various significance levels across the 21 specifications, where *** indicates significance at 1%, **" indicates significance at 5%, * indicates significance at 10% and ' indicates significance at 15%.

Values for number of cities and R-square were computed as simple averages across all specifications.

Sources: All dependent variables drawn from UN 1998 and EOS 2003; globalization index downloaded from Foreign Policy Magazine, 2002 (Kearney); country population and urbanization drawn from WDI 2002; city population downloaded from website: www.citypopulation.de ; port, capital, size ratio, budget, website and business dummies drawn from KLM 2004; Global city (3) drawn from GAWC (Taylor); income per capita drawn from Heston-Summers and CIA World Factbook (2001).

We have summarized the results of the many econometric specifications to explain the potential determinants of city governance in the synthesis in Table 6 (the full set of regressions are available upon request).

In the next Section, we discuss the potential importance of issues other than governance and globalization for city performance, focusing on issues such as the effects of technology, size and scale effects, type of cities, as well as the urbanization indicator and regulation.

6 Globalization, Technology, Scale, and City Characteristics

6.1 The Effect of Technology and Service Characteristics

The analysis in Sections 4 and 5 indicated a differential impact of governance and globalization across city performance in terms of infrastructure service delivery. We test the conjecture that the more the technology of infrastructure or a particular service from utilities permits individuals to exit networked systems, and self-provide such services, the less relevant is the effect of globalization and its pressures for good performance, or the value of good governance on city performance. That is, cities will have high performance with respect to such services even if they are poorly governed or less global.

Contrast for instance the access to telephones as can be seen in Figure 1f and access to cell phones in Figure 1g, to the access to telephone lines in Figure 1a, shown earlier in Section 4.4. The role of governance and globalization is almost neutralized as people and firms are able to get access to telephones (Figure 1f) or access to cell phones (Figure 1g) independently of the city's utility company, but are highly dependent on globalization and its pressures and good governance when it comes to lumpy investments such as access to telephone lines (Figure 1a). This is evident through the wider gap between well governed and poorly governed global cities for access to the telephone lines, compared to a narrower gap in the difference between well governed and less well governed global cities in the access to telephones and to cell phones.

We do know that having a telephone line is critical for internet services and hence to the aspect of globalization that allows firms to exchange ideas and information as well as co-produce services across multiple cities, regardless of geographical proximity. The results in Figures 1f and 1g, contrasted to those in Figure 1a, demonstrate what many have argued as the negative impact of the digital divide. As wireless technology becomes more available, the impact of this constraint will diminish.

The results in Figure 1f and 1g give evidence that in poorly governed and less global cities, if individuals and private companies are not totally regulated, they are creative enough to manage and globalize themselves where technology so permits. By contrast, even when technological leaps have taken place but government involvement is still needed, technology alone will not deliver the goods. Witness poor performance of internet access in schools in general for poorly governed cities (whether local or global) and local cities in particular (Figure 1h). One still needs good governance and globalization still delivers advantages when it comes to heavily networked services and infrastructure. These results

are even more pronounced when you look at the full data set including OECD countries (results available upon request).

The main reason, for the differential performance of cities with respect to services such as access to water and electricity, may be the fact that citizens do have alternatives when these services are not well provided. A resident can dig a well or use other forms of water supply such as from private vendors, or install a generator for electricity.

This would also be true of firms, and there are many examples of companies installing their own infrastructure services.[17] The real impact of globalization is seen or is measurable for those services where it is difficult to exit, such as telephone lines for data dependent business (internet), sewerage services which are networked, or the quality of infrastructure which has to be superior to attract residents and firms. This is where the data is sharp enough to demonstrate the differential contribution of globalization at the city level.

This result can also be seen when you contrast the access to electricity shown in Figure 1d to the quality of electricity services (blackouts, power surges, brownouts) shown in Figure 1i. The access to electricity in Tables 2a through 2c (Section 4.4) and Figure 1d seemed to be not correlated to any variable of governance or globalization. However, the quality of electricity services in Figure 1i, and substantiated in Table 3 and 4, shows strong differentiation between well governed and poorly governed cities and the results hold for both local and global cities. It could be that we did not see such effects in Figure 1d, because most people had access to the grid or could exit the system and have their own generators, particularly in more global cities, where the demand by global firms for reliable electricity services may be higher.

The real difference in performance shows up when you look at quality of electricity, since companies may have made their own investments in self-generation to deal with brownouts or blackouts but cannot guarantee a reliable service by themselves as this would require a more sizeable investment. They have to rely for quality on the city utility even if they can get access from self-generation. It is also clear from these results that good governance plays an important role in delivering quality of services over a longer period of time—the staying power of cities in terms of performance. Witness that this result was also strong for the overall quality of infrastructure in Figure 1e.

We can draw the following conclusions from the earlier tests on Hypotheses 1 through 3, and from the results in Figures 1f through 1i: There is strong evidence supporting the hypothesis that globalization is associated with improved governance, which in turn results in improved city performance as measured by service delivery variables. The latter may also benefit directly from improved city globalization, and not merely through the (apparently important) indirect effect through governance. These positive feedback results whereby a global city may benefit even more from good governance than a local city are backstopped empirically by the finding that there is a significant interactive component

[17] See Lee, Kyu Sik and Alex Anas in "The Benefits of Alternative Power Tariffs for Nigeria and Indonesia", Policy Research Working Paper # 1606, World Bank, May 1996 who have demonstrated this phenomenon using micro-level data.

between governance and a global city. However, the nature of services does make a difference, as exemplified particularly by electricity, but also by access to the internet. The electricity regressions do not perform at all (some with negative adjusted R-squares) except when you use the "quality of electricity", a measure of the reliability of service. This is in contrast with the other three service delivery variables of access to telephones, water, sewerage, and to the quality of infrastructure. We believe that this is due to the ability of citizens to use choice rather than voice, when it comes to such services, and hence the weak relationship between governance variables many of which are measures of voice, as transmitted by political decisions at the city level.

6.2 The Effect of City Size

The results in Section 5 which are described in detail in Table 4 indicated that large and populous countries have issues with governance (particularly corruption in access to utilities and in taxes) indicating that overall country size does matter after all. The effect of the size and characteristics of the city are also worthy of exploring. Compare the results in the relevant population columns in Table 7a through 7c and then in more detail in Table 7d.

TABLE 7a: City Performance by city size and country development – Full sample (412 Cities)
Average Ratings

CITY PERFORMANCE	POPULATION		DEVELOPMENT			
	City Population		Country Urbanization, WDI 2002		Country Income per capita, 2001	
	Low	High	Low	High	Low	High
Access to Sewerage (%, UN)	86%	69%	59%	93%	60%	97%
Access to Water (%, UN)	90%	79%	71%	98%	72%	100%
Access to Electricity (%, UN)	91%	89%	86%	97%	84%	100%
Access to Telephone lines 1 (%, UN)	64%	50%	43%	85%	38%	93%
Access to telephone lines 2 (1-7, EOS)	5.3	5.3	4.7	6.2	4.6	6.2
Access to Cellular phones (1-7, EOS)	6.0	6.0	5.7	6.5	5.6	6.5
Access to Internet in schools (1-7, EOS)	3.9	3.7	3.2	4.7	3.0	4.9
Quality of Infrastructure (1-7, EOS)	3.7	4.0	3.1	4.8	3.0	4.9
Quality of Electricity (1-7, EOS)	4.6	4.6	4.0	5.5	3.8	5.8
Overall Number of Cities	**205**	**205**	**183**	**183**	**212**	**200**

Note: Each column variable was segmented into two equal samples, below and above the median value of full sample.

From these results, we draw the following preliminary conclusions:

a) The size of the city population does seem to have an impact on some services (Table 7a through 7c). For example, in more populous cities, it seems more difficult to get good access to services such as sewerage, water, electricity, and telephones. The OECD countries seem to perform better in this regard, indicating that with increasing wealth the constraint of city population disappears (see also the positive effect of income on city performance). However, there appears to be no adverse 'megacity' effect per se—cities with more than 5m. population do not perform below others in a range of access and quality variables (see Table 8a). While diseconomies of scale may exist in particular determinants of performance for megacities (complexity of management, for instance), they may be neutralized by agglomeration (scale) economies in other dimensions (lumpy investments, etc.).

TABLE 7b: City Performance by city size and country development – Non OECD sample (274 Cities)
Average Ratings

CITY PERFORMANCE	POPULATION		DEVELOPMENT			
	City Population		Country Urbanization, WDI 2002		Country Income per capita, 2001	
	Low	High	Low	High	Low	High
Access to Sewerage (%, UN)	80%	61%	56%	76%	53%	83%
Access to Water (%, UN)	90%	73%	66%	89%	66%	93%
Access to Electricity (%, UN)	91%	86%	82%	94%	82%	95%
Access to Telephone lines 1 (%, UN)	65%	45%	36%	69%	31%	74%
Access to telephone lines 2 (1-7, EOS)	5.1	4.6	4.5	5.3	4.3	5.4
Access to Cellular phones (1-7, EOS)	5.8	5.7	5.6	6.0	5.4	6.1
Access to Internet in schools (1-7, EOS)	3.7	2.9	3.0	3.8	2.6	4.0
Quality of Infrastructure (1-7, EOS)	3.3	3.2	3.0	3.6	2.8	3.7
Quality of Electricity (1-7, EOS)	4.3	3.8	3.7	4.5	3.4	4.7
Overall Number of Cities	**136**	**136**	**124**	**107**	**137**	**137**

Note: Each column variable was segmented into two equal samples, below and above the median value of full sample.

b) There appears to be some evidence of a simple city size effect for the rest (non-megacity) of the sample, and such an effect is non-linear (compare Table 7b and 7c and the population columns in Table 8a). In particular, we observe a U-shaped size-performance curve: mid-size cities with population between half a million and one million perform worse than both their smaller *and* their larger counterparts. Relatively small as well as large cities in fact do similarly. It is almost as if mid-size cities suffer from management diseconomies compared with their smaller counterparts, without benefiting yet from scale economies of larger size cities. This

may be due to the requirement of large lumpy infrastructure investments (which cities larger than 1m. may benefit from).

TABLE 7c: City Performance by city size and country development – OECD sample (138 Cities)
Average Ratings

CITY PERFORMANCE	POPULATION		DEVELOPMENT			
	City Population		Country Urbanization, WDI 2002		Country Income per capita, 2001	
	Low	High	Low	High	Low	High
Access to Sewerage (%, UN)	100%	99%	99%	100%	99%	100%
Access to Water (%, UN)	100%	100%	99%	100%	100%	100%
Access to Electricity (%, UN)	100%	100%	100%	100%	100%	100%
Access to Telephone lines 1 (%, UN)	94%	95%	92%	100%	84%	96%
Access to telephone lines 2 (1-7, EOS)	6.4	6.5	6.1	6.8	6.4	6.5
Access to Cellular phones (1-7, EOS)	6.6	6.7	6.5	6.8	6.6	6.7
Access to Internet in schools (1-7, EOS)	5.3	5.3	4.7	5.8	5.0	5.8
Quality of Infrastructure (1-7, EOS)	5.4	5.5	4.9	6.0	5.2	5.8
Quality of Electricity (1-7, EOS)	6.3	6.1	5.8	6.6	6.0	6.4
Overall Number of Cities	**69**	**69**	**72**	**63**	**72**	**66**

Note: Each column variable was segmented into two equal samples, below and above the median value of full sample.

c) Cities tend to be better governed than non-urban agglomerations such as large villages and small towns, as the country urbanization indicator (a measure of the share of a country's population living in cities) shows overall better results when it is high than when it is low even for more advanced economies (Table 7a through 7c). This indicator is also positively correlated to low bribery in utilities (see Annex A)and soundness of Banks (Table 4). The detailed regression results in Table 4 also show that city size (city population) has no significant impact on most of the governance variables except low bribery in utilities, low informal money laundering, low diversion of public funds, and low bribery in permits. Large cities can be as well governed as small cities. This result is further reason why one needs to look at globalization and urbanization, as cities seem to be better able to handle governance questions than rural agglomerations. Coupled with the result of the test to hypothesis 1 that suggests that residents in global cities benefit more from good governance than those in local cities, supports our argument that good governance of cities is even more critical in a globalized world.

6.3 The Effect of City Type

In Table 6, we saw that port cities, which tend to be more open to the world as a result of transport and logistics services they offer, are better governed with respect to low informal money laundering, diversion of public funds and illegal party financing, but have the same issues as other cities when it comes to bribery in taxes, cost of imports and bribery to affect laws. The fact that we find three positive and significant governance variables with respect to port cities and three negative and significant governance variables with respect to capital cities indicates that the differential openness of port cities to the global network does make a difference in their governance outcomes, lending further support of the results from the UNCHS data set.

We see that port cities do better than none port cities for all services that are related to data and communications (access to telephone lines, access to cellular phones, and access to the internet) as shown in Table 8a. This result is expected as the logistic dependencies of port cities are well documented. Since port cities tend to be more global than other cities, this result is also consistent with the earlier results on the importance of communications infrastructure for globalization. It is also notable from Table 8a that the impact of the quality of infrastructure is also supported for the case of port cities.

The more interesting result, is we find no evidence of the superior performance of capital cities with respect to offering better services to their citizens, in the areas of communications services (telephones, cell phones, internet) nor quality of infrastructure, but we do with respect to local services such as sewerage, water and electricity. Capital cities seem to serve a more local function than port cities.

Table 8a: City Performance by City Attributes
Non OECD Sample(274 Cities)
Average Ratings

	CITY TYPES							
	Port		Capital		Population			
	No	Yes	No	Yes	Small <.5m.	Midsize .5<p<1m.	Large 1<p<5m.	Mega >5m.
Access to Sewerage (%, UN)	50%	41%	42%	49%	80%	59%	56%	81%
Access to Water (%, UN)	64%	62%	59%	65%	90%	69%	71%	84%
Access to Electricity (%, UN)	79%	70%	73%	76%	91%	77%	90%	83%
Access to Telephone lines 1 (%, UN)	90%	81%	84%	87%	65%	40%	44%	54%
Access to Telephone lines 2 (1-7, EOS)	4.8	5.1	5.0	4.7	5.1	4.2	4.5	5.5
Access to Cellular phones (1-7, EOS)	5.7	5.9	5.8	5.7	5.8	5.6	5.6	6.0
Access to Internet in schools (1-7, EOS)	3.3	3.5	3.5	3.0	3.7	2.6	2.8	3.6
Quality of Infrastructure (1-7, EOS)	3.2	3.4	3.3	3.3	3.3	2.7	3.3	3.4
Quality of Electricity (1-7, EOS)	4.2	4.0	4.1	4.0	4.3	3.6	3.8	4.1
Overall Number of Cities	**167**	**106**	**178**	**96**	**135**	**29**	**86**	**22**

The results in Table 8b where we specifically look at whether a city has a web portal or not and whether it posts information on how to start a business in the city or the budget information are even more conclusive. All three indicators of good governance show a marked difference with respect to access to services.

In particular, having a website and posting information on the budget in the website (a measure of voice and transparency for all types of citizens even those who are not geographically resident in a city) is correlated to superior access to services (Table 8b). This is also true with respect to whether the website has information on how to start a business.

Table 8b: City Performance by City Technology
NON-OECD SAMPLE (274 Cities)

Average Ratings

CITY PERFORMANCE	CITY WEB PORTAL					
	City has a Website		Web has information on budget		Web information on how to start a business	
	No	Yes	No	Yes	No	Yes
Access to Sewerage (%, UN)	44%	54%	46%	70%	45%	72%
Access to Water (%, UN)	62%	68%	63%	92%	62%	90%
Access to Electricity (%, UN)	75%	76%	75%	91%	74%	93%
Access to Telephone lines 1 (%, UN)	84%	93%	86%	99%	86%	95%
Access to telephone lines 2 (1-7, EOS)	4.8	5.3	4.9	5.7	4.9	5.6
Access to Cellular phones (1-7, EOS)	5.7	6.1	5.8	6.1	5.8	6.0
Access to Internet in schools (1-7, EOS)	3.3	3.4	3.3	3.4	3.3	3.5
Quality of Infrastructure (1-7, EOS)	3.3	3.4	3.3	3.5	3.3	3.5
Quality of Electricity (1-7, EOS)	4.1	4.0	4.1	3.8	4.1	4.6
Overall Number of Cities	**210**	**58**	**262**	**6**	**256**	**12**

We caution that these results are derived from uncontrolled statistical averages for different population range segments, without controlling for other factors. Some of these effects may disappear once lots of controls are included, but that would in part be due to some of the potential explanation of such non-linear effects in the first place. Such work is relegated to further research.

7 Concluding: Future Research and Emerging Policy Implications

7.1 Brief synthesis

In this paper we attempted to contribute to the field of urban governance and globalization through an empirically-based exploration of some key determinants of the performance of cities. This empirical inquiry was made possible through the construction of a worldwide database for cities that contains variables and indicators of globalization (at the country and city level), of city governance, and of city performance (access and quality of infrastructure service delivery). This city database integrates existing data with new data gathered specifically for this research project. We find that good governance and globalization matter for city-level performance in terms of access and quality of delivery of infrastructure services, and also that globalization and good city governance are related. There appear to be dynamic pressures from globalization and accountability that result in better performance at the city level. Furthermore, we find that there are complex interactions between technology, governance and city performance, as well as evidence of a non-linear (u-shaped) relationship between city size and performance, challenging the view that very large cities necessarily exhibit lower performance and pointing to potential agglomeration economies. Our framework also suggests a way of bridging two seemingly competing strands of the literature, namely viewing the city as a *place* or as an *outcome*. We find evidence that port cities seem to be in general more dependent on good governance for the city performance variables that matter for globalization (access to cell phone, internet access) and that capital cities tend more to serve local sewerage access better (water sewerage, electricity).

7.2 Issues for Future Research

There are a number of issues to consider for future research. First, with our dataset and empirical approach we need to keep in mind both a purely statistical point, as well as one of a more methodological/conceptual nature. The first refers to the limits we have after crossing variables from different datasets (Taylor/UN/EOS) in terms of the overlapping number of observations/cities (N), which for some indicators in Table 1 is very small. Thus, a major challenge in the next stage is to expand this database, and fill in the significant gaps within the existing set of over 400 cities. We expect to be able to collaborate with partners in this initiative. This expanded database would be made available on the web to all researchers and policy-makers (see Annex C for the current list of cities for which this dataset has information on at least some of the variables of interest in this research project).

Second, we need to probe much deeper than was possible in this preliminary exploration on the issue of the dynamics between globalization and governance, and their interface with city performance. For instance, we found that globalization and governance are positively correlated with each other at the city level. Our simple conceptual and econometric model pointed to possible causality from globalization to good governance. Yet it cannot be ruled out obviously that in reality there is bi-directional causality, within an endogenous model

where there is a possible virtuous circle between both variables. Within such a framework, an extension of the simple model presented in this paper would be warranted.[18] This requires further research with additional data and a more complex econometric model with instruments, *inter alia* accounting for endogeneity issues. Furthermore, in this context the brief references to ancient times made earlier are suggestive of the need to probe further with an historical perspective.

Other areas of investigation could include looking at the influence of diaspora networks on the governance of a city as well as the influence of NGO movements for instance on human rights, environment, and corporate social responsibility issues within the context of the city, and its links to public governance. Expanding on the research on the interface between technology choices, governance and city performance also appear to be a promising line of inquiry from an empirical standpoint.

7.3 Policy Implications

The analysis we have done has provided empirical evidence on many observations and statements made in the past by experts in the field, prior to the gathering and analysis of a data. From this perspective, a number of policy conclusions emerge.

First, our results are suggestive on the importance of focusing on country-wide governance, thereby tapping into economic benefits for the country at large but also providing a platform for cities to benefit from such environment-wide improvements. This suggests that reformist majors have an incentive to promote good governance at the national level (given the large externalities for the city). Further, International Financial Institutions (IFIs, such as the World Bank) and donors ought to continue to monitor and assess in some detail, how countries are faring with respect to governance at the national level. This makes sense not only from a country-wide performance standpoint, but also to point to ways of improving city-level performance.

Second, our framework and evidence also points to the fact that improving governance at the city level allows cities to translate global opportunity into local value for their citizens. This implies that reformist city leaders do have important local policy and institutional

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[18] In essence we could conceptualize of another hypothesis, where the ability of cities to translate global opportunity into local value depends on governance, and that cities compete with each other on the basis of governance and not on the basis of initial endowments (infrastructure, culture etc). Cities with better governance remain globalized for longer periods of time (attract higher flows of capital, people, firms, finance, products) or attract such flows systemically over time (growth or change in volumes of these flows over time). This test would allow us to distinguish between those cities that are highly global and then drop in their rankings over time. For such a test, we would need at least two time periods. A possible model specification could include:

$\Delta Y = f(X_1, X_2, X_3)+\varepsilon$ where

ΔY = change in the vector of governance indicators, to capture improvements or deterioration in governance over time which is a proxy for staying power in translating global opportunity to local value;

X1 = a dummy for an alpha city from the Taylor database; X2 = dummy for a beta city, and

X3 = dummy for a gamma city . With such a specification one could investigate whether alpha and beta type cities have better governance compared to the gamma type cities.

levers at their disposal: governance at the local level matters significantly for urban performance. Similarly, this finding suggests that donor agencies could focus more on supporting improvements in city level governance.

Third, it is important to work with cities to support their globalization process and status. In this context, the interface between globalization, technology and governance deserves attention. In practical terms, web-related transparency and information outreach innovations are worthy illustrations, such as placing procurement and the budget on the city website, as well as a one-stop information and licensing 'e-window' for business start-ups. In this context, it may also be important to have a set of incentives and strategies for cities to network with other cities to further tap into global opportunities that will benefit a given city. This would imply that IFIs such as the World Bank work with inter-city governance alliances and networks, such as the association of local governments and the city-to-city partnership, such as "Cities Alliance".

Finally, the benefits of an interface with technology can go further, and in particular where there are obstacles to governance and globalization reforms at the city level. As we noted in the results, the evidence suggests the fact that some new technologies may offer a partial substitute to a lack of political will to implement reforms by the (city and country) public leadership. New technologies, such as mobile phones and internet computing, enables private firms and city residents to effectively become more globalized, thus enabling them to overcome some of the impact of poor governance and/or lack of leadership to become a global city. However, such a mitigating effect of technology can only be partial where governance and accountability is wanting, given the high mobility of residents, firms and capital – they all have an 'exit' option.

Furthermore, even as technological improvements will continue to provide individualized private solutions as substitutes to large scale infrastructure provision, there always will be some services where (given their economies of scale and indivisibility) the public sector would continue to play an important role. For appropriate public and private sector strategies, it becomes increasingly important for donor agencies and city managers alike to distinguish between different types of infrastructure services depending on the technologies available at any point of time, and the particular city characteristics.

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ANNEX A: Correlation Matrix of Selected Governance Variables and Service Access/ Performance

FULL SAMPLE

	Bribery in Utility	State Capture	Control of Corruption
Access to Telephones [1]	0.69***	0.47***	0.66***
Access to Sewerage	0.58***	0.45***	0.55***
Access to Water	0.57***	0.45***	0.52***
Access to Electricity	0.31**	0.27**	0.31***
Quality of Infrastructure	0.79***	0.82***	0.83***
Quality of Electricity	0.85***	0.77***	0.84***
Access to Telephones [2]	0.83***	0.64***	0.74***
Access to Cell Phones	0.67***	0.57***	0.64***
Access to Internet in school	0.82***	0.80***	0.88***
AVERAGE	**0.68**	**0.58**	**0.66**

GLOBAL CITY SAMPLE

	Bribery in Utility	State Capture	Control of Corruption
Access to Telephones [1]	0.75***	0.52**	0.69***
Access to Sewerage	0.57	0.38	0.52*
Access to Water	0.58*	0.35	0.54*
Access to Electricity	0.32	0.26*	0.37**
Quality of Infrastructure	0.74***	0.76***	0.79***
Quality of Electricity	0.87***	0.76***	0.84***
Access to Telephones [2]	0.84***	0.60***	0.73***
Access to Cell Phones	0.67***	0.57***	0.59***
Access to Internet in school	0.81***	0.77***	0.84***
AVERAGE	**0.68**	**0.55**	**0.66**

LOCAL CITY SAMPLE

	Bribery in Utility	State Capture	Control of Corruption
Access to Telephones [1]	0.58***	0.25	0.60***
Access to Sewerage	0.44*	0.29	0.38***
Access to Water	0.41**	0.34**	0.39***
Access to Electricity	0.33*	0.32*	0.23**
Quality of Infrastructure	0.67***	0.70***	0.66***
Quality of Electricity	0.66***	0.51***	0.63***
Access to Telephones [2]	0.71***	0.49***	0.60***
Access to Cell Phones	0.43***	0.22*	0.47***
Access to Internet in school	0.63***	0.58***	0.81***
AVERAGE	**0.54**	**0.41**	**0.53**

Note: This Annex complements Table 3 in the paper. It shows pairwise correlations between selected governance variables and service access/performance variables for the full sample and for the two equal sub-samples of global and local cities.

ANNEX B: DETERMINANTS OF CITY GOVERNANCE – SYNTHESIS OF ECONOMETRIC REGRESSION RESULTS

Source	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003	EOS 2003
Dependent Variables	**Low Bribery in Utilities**	**Low Informal Money Laundering**	**Low Street Crime**	**Red Tape Cost of Imports**	**Low Bribery to affect laws**	**Low Diversion public funds**	**Low Illegal Party Financing**	**Low Bribery in Permits**	**Low Bribery in Tax**	**Soundness of Banks**	**Trust in Politicians**	**Low Organized crime**	**Quality of Postal System**	**Low Health gap**
	1-7 (good)	**1-7 (good)**	**1-7 (good)**	**1-9 (bad)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**	**1-7 (good)**
City Variables														
City Population	+ / '	+ / '	0 / 0	0 / 0	+ / 0	+ / '	0 / 0	++ / *	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
Global City (3)	+ / '	++ / ***	+ / '	- / **	++ / **	++ / **	++ / ***	++ / **	++ / **	+ / **	++ / ***	+ / **	++ / **	+ / '
Country city size ratio	+ / '	+ / '	+ / '	0 / 0	+ / '	+ / '	+ / *	+ / *	+ / '	0 / 0	+ / *	+ / *	+ / 0	0 / 0
Business Dummy	++ / ***	+++ / ***	++ / **	- / '	++ / **	+++ / ***	++ / **	++ / ***	++ / *	++ / **	++ / **	++ / **	++ / **	+++ / ***
Website dummy	+ / 0	+ / '	+ / 0	0 / 0	+ / 0	+ / '	0 / 0	+ / '	+ / '	0 / 0	+ / '	+ / *	+ / '	+ / '
Budget Dummy	0 / 0	+ / 0	+ / 0	0 / 0	- / 0	0 / 0	0 / 0	0 / 0	0 / 0	+ / 0	- / 0	0 / 0	+ / '	+ / 0
Port Dummy	0 / 0	+ / '	+ / 0	0 / 0	0 / 0	+ / '	+ / '	0 / 0	- / '	+ / 0	+ / 0	+ / 0	0 / 0	0 / 0
Capital Dummy	0 / 0	- / '	0 / 0	+ / 0	- / 0	- / '	- / '	- / *	- / 0	- / '	- / '	0 / 0	- / '	- / 0
Country Variables														
Country Population	--- / ***	-- / '	- / 0	++ / '	-- / *	-- / *	--- / **	--- / ***	--- / **	-- / **	-- / *	-- / '	- / '	--- / ***
Urbanization (%)	++ / **	0 / 0	-- / '	0 / *	+ / '	0 / 0	0 / 0	+ / *	++ / '	+ / '	0 / 0	- / 0	- / 0	- / 0
Kearney Globalization Index	++++ / ***	++++ / ***	++++ / ***	--- / ***	+++ / ***	++++ / ***	++++ / ***	++++ / ***	++++ / ***	+++ / ***	++++ / ***	++++ / ***	++++ / ***	++++ / ***
Income per capita	++++ / ***	+++ / ***	++++ / ***	---- / ***	++++ / ***	++++ / ***	+++ / ***	++++ / ***	++++ / ***	+++ / ***	++++ / ***	+++ / ***	++++ / ***	++++ / ***
# of cities	**193**	**193**	**193**	**193**	**193**	**193**	**193**	**193**	**193**	**193**	**193**	**193**	**193**	**193**
Adjusted R-squared	**0.30**	**0.21**	**0.19**	**0.24**	**0.21**	**0.29**	**0.17**	**0.25**	**0.28**	**0.15**	**0.21**	**0.18**	**0.29**	**0.31**

Source: KLM city database, drawing from EOS-WEF 2003 as well as other sources as per below. All dependent variables range from bad to good with exception of costs of imports.

Sample size: 412 cities in 134 countries.

Values for magnitude (+,0,-) and significance (*,0,') in each cell were obtained by averaging results of 21 different OLS specifications. In particular, for each independent variable, for calculating the magnitude of the coefficient rating (left hand side), we computed the product of the average coefficient magnitude across all specifications times twice the standard deviation of the variable. Then we assigned magnitude values according to the following criteria: for positive coefficients, we applied a "++++" for any value above 1.2; "+++" for any value between 0.7 and 1.2; "++" for any value between 0.4 and 0.7 ; "+" for any value between 0.1 and 0.4; and finally a "0"'for any value below 0.1. Similarly, minus signs were applied to negative coefficients. For the rating on the significance of the coefficient in each cell (right hand side), we averaged the various significance levels across the 21 specifications, where *** indicates significance at 1%, **" indicates significance at 5%, * indicates significance at 10% and ' indicates significance at 15%.

Values for number of cities and R-square were computed as simple averages across all specifications.

Sources: All dependent variables drawn from UN 1998 and EOS 2003; globalization index downloaded from Foreign Policy Magazine, 2002 (Kearney); country population and urbanization drawn from WDI 2002; city population downloaded from website: www.citypopulation.de ; port, capital, size ratio, budget, website and business dummies drawn from KLM 2004; Global city (3) drawn from GAWC (Taylor); income per capita drawn from Heston-Summers and CIA World Factbook (2001).

ANNEX C: LIST OF CITIES IN THE KLM DATABASE

CITIES	COUNTRY	CITIES	COUNTRY	CITIES	COUNTRY
Kabul	Afghanistan	Xiamen	China	Munich	Germany
Tirana	Albania	BARRANQUILLA	Colombia	Stuttgart	Germany
Algiers	Algeria	Bogota	Colombia	Accra	Ghana
CONSTANTINE	Algeria	Manizales	Colombia	TEMA	Ghana
ORAN	Algeria	MEDELLIN	Colombia	Athens	Greece
REGHATA	Algeria	PEREIRA	Colombia	Guatemala City	Guatemala
Luanda	Angola	Kinshasa	Congo, dem. Rep.	Conakry	Guinea
Buenos Aires	Argentina	ALAJUELA	Costa Rica	Georgetown	Guyana
SAN FERNANDO	Argentina	CARTAGO	Costa Rica	PORT-AU-PRINCE	Haiti
Yerevan	Armenia	HEREDIA	Costa Rica	LA CEIBA	Honduras
Adelaide	Australia	CAKOVEC	Croatia	SAN PEDRO SULA	Honduras
Brisbane	Australia	KARLOVAC	Croatia	TEGUCIGALPA	Honduras
Canberra	Australia	OSIJEK	Croatia	VILLANUEVA	Honduras
Hobart	Australia	PULA	Croatia	Hong Kong	Hong Kong
Melbourne	Australia	RIJEKA	Croatia	Budapest	Hungary
Perth	Australia	SPLIT	Croatia	GYONGYOS	Hungary
Sydney	Australia	VARAZDIN	Croatia	KAPOSVAR	Hungary
Wellington	Australia	ZADAR	Croatia	TATABANTA	Hungary
Linz	Austria	Zagreb	Croatia	REYKJAVIK	Iceland
Vienna	Austria	Havana	Cuba	Ahmadabad	India
Baku	Azerbaijan	Limassol	Cyprus	Bangalore	India
Manama	Bahrain	Nicosia	Cyprus	Calcutta	India
Dhaka	Bangladesh	Prague	Czech Republic	Chennai	India
Minsk	Belarus	Aarhus	Denmark	DELHI	India
Antwerp	Belgium	Copenhagen	Denmark	Hyderabad	India
Brussels	Belgium	Santo Domingo	Dominican Republic	Jaipur	India
WATERLOO	Belgium	CUENCA	Ecuador	Lucknow	India
La Paz	Bolivia	Guayaquil	Ecuador	Mumbai	India
SANTA CRUZ	Bolivia	IBARRA	Ecuador	New Delhi	India
GABORONE	Botswana	Quito	Ecuador	PUNE	India
Belo Horizonte	Brazil	10TH OF RAMADAN	Egypt	Bandung	Indonesia
Brazilia	Brazil	6TH OF OCTOBER	Egypt	Batam	Indonesia
Curitiba	Brazil	Cairo	Egypt	Jakarta	Indonesia
Porto Alegre	Brazil	GIZA	Egypt	Medan	Indonesia
Recife	Brazil	ANTIGUO CUSCATLAN	El Salvador	Tehran	Iran
Rio de Janeiro	Brazil	San Salvador	El Salvador	Baghdad	Iraq
Salvadore	Brazil	TALLINN	Estonia	CORK	Ireland
Sao Paulo	Brazil	TARTU	Estonia	Dublin	Ireland
Sofia	Bulgaria	Addis Ababa	Ethiopia	Jerusalem	Israel
VARNA	Bulgaria	ESPOO	Finland	Tel Aviv	Israel
Douala	Cameroon	Helsinki	Finland	BELLUNO	Italy
Yaounde	Cameroon	Lille	France	Bologna	Italy
Calgary	Canada	Lyon	France	Genoa	Italy
Edmonton	Canada	Marseilles	France	Milan	Italy
Montreal	Canada	Paris	France	Naples	Italy
Ottawa	Canada	Strasbourg	France	PORDENONE	Italy
Quebec	Canada	BACAU	Gambia	Rome	Italy
Toronto	Canada	BANJU	Gambia	Turin	Italy
Vancouver	Canada	KANIFING	Gambia	Abidjan	Ivory Coast
Winnipeg	Canada	SEREKUNDA	Gambia	Kingston	Jamaica
N'DJAMENA	Chad	Berlin	Germany	Kyoto	Japan
Santiago	Chile	Bonn	Germany	Nagoya	Japan
TALCAHUANO	Chile	Dortmund	Germany	Osaka	Japan
Beijing	China	Dresden	Germany	Tokyo	Japan
Dalian	China	Dusseldorf	Germany	Yokohama	Japan
Guangzhou	China	Essen	Germany	Amman	Jordan
Nanjing	China	Frankfurt	Germany	Almaty	kazakhstan
Shanghai	China	Hamburg	Germany	Mombasa	Kenya
Shenzhen	China	KOELN	Germany	Nairobi	Kenya
Tianjin	China	Leipzig	Germany	Pyongyang	Korea, north

ANNEX C: LIST OF CITIES IN THE KLM DATABASE (contd.)

CITIES	COUNTRY	CITIES	COUNTRY	CITIES	COUNTRY
Pusan	Korea, South	Casablanca	Morocco	PREVIDZA	Slovak Republic
Seoul	Korea, South	Rabat	Morocco	CELJE	Slovenia
Kuwait	Kuwait	MAPUTO	Mozambique	KRANJ	Slovenia
AIZKRAUKLES	Latvia	MATOLA	Mozambique	Ljubljana	Slovenia
DAUGAVPILS	Latvia	Yangon	Myanmar	MARIBOR	Slovenia
KULDIGA	Latvia	Windhoek	Namibia	MURSKA SOBOTA	Slovenia
LIEPAJA	Latvia	Amsterdam	Netherlands	NOVO MESTO	Slovenia
OGRE	Latvia	ARNHEM	Netherlands	SLOVENJ GRADEC	Slovenia
RIGA	Latvia	Rotterdam	Netherlands	Cape Town	South Africa
VENTSPILS	Latvia	The Hague	Netherlands	Durban	South Africa
Beirut	Lebanon	Utrecht	Netherlands	Johannesburg	South Africa
Monrovia	Liberia	Auckland	New Zealand	MIDRAND	South Africa
Tripoli	libya	Christchurch	New Zealand	Pretoria	South Africa
ALYTUS	Lithuania	Managua	Nicaragua	Barcelona	Spain
KAUNAS	Lithuania	IKEJA	Nigeria	Bilbao	Spain
KLAIPEDA	Lithuania	Lagos	Nigeria	Madrid	Spain
MARIJAMPOLE	Lithuania	Bergen	Norway	Seville	Spain
PANEVEZYS	Lithuania	Oslo	Norway	Valencia	Spain
SIAULIAI	Lithuania	STAVANGER	Norway	Colombo	Sri Lanka
SILUTE	Lithuania	Ruwi	Oman	MOUNT LAVINIA	Sri Lanka
UKMERGE	Lithuania	Islamabad	Pakistan	Khartoum	Sudan
VILNIUS	Lithuania	Karachi	Pakistan	Gothenburg	Sweden
Luxembourg	Luxembourg	Lahore	Pakistan	Stockholm	Sweden
STRASSEN	Luxembourg	Rawalpindi	Pakistan	Basel	Switzerland
Macau	Macao	Panama City	Panama	Geneva	Switzerland
BITOLA	Macedonia	Asuncion	Paraguay	ST-GALLEN	Switzerland
KUMAHOVO	Macedonia	CIUDAD DEL ESTE	Paraguay	Zurich	Switzerland
OHRID	Macedonia	FDO.DE LA MORA	Paraguay	Damascus	Syria
PRILEP	Macedonia	SANTA RITA	Paraguay	KAOHSIUNG	Taiwan
SKOPJE	Macedonia	CALLAO	Peru	TAICHUNG	Taiwan
STIP	Macedonia	Lima	Peru	Taipei	Taiwan
STRUMICA	Macedonia	HO-PASIG	Philippines	ARUSHA	Tanzania
VELES	Macedonia	MAKATI	Philippines	DAR-ES-SALAAM	Tanzania
ANTANANARIVO	Madagascar	Manila	Philippines	MOROGORO	Tanzania
TOAMASINA	Madagascar	PARANAQUE	Philippines	Bangkok	Thailand
BLANTYRE	Malawi	Warsaw	Poland	Lome	Togo
LILONGWE	Malawi	Lisbon	Portugal	ARIMA	Trinidad and Tobago
Kuala Lumpur	Malaysia	Doha	Qatar	COUVA	Trinidad and Tobago
Labuan	Malaysia	ALBA IULIA	Romania	Port of Spain	Trinidad and Tobago
Malacca	Malaysia	Bucharest	Romania	SFAX	Tunisia
Penang	Malaysia	CONSTANTA	Romania	SOUSSE	Tunisia
PETALING JAYA	Malaysia	CRAIOVA	Romania	Tunis	Tunisia
SHAH ALAM	Malaysia	IASI	Romania	Ankara	Turkey
BAMAKO	Mali	ORADEA	Romania	BALIKESIR	Turkey
SEGOU	Mali	PIATRA NEAMT	Romania	Istanbul	Turkey
FLORIANA	Malta	PLOIESTI	Romania	Kampala	Uganda
GZIRA	Malta	RAMNICO VALCEA	Romania	Kueb	Ukraine
MARSA	Malta	SLATINA	Romania	Abu Dhabi	United Arab Emirates
SAN GWANN	Malta	TARGOVISTE	Romania	Dubai	United Arab Emirates
SLIEMA	Malta	CAMAPA	Russia	Birmingham	United Kingdom
VALLETTA	Malta	Moscow	Russia	Bristol	United Kingdom
ZEJTUN	Malta	St Petersburg	Russia	Cardiff	United Kingdom
PORT LOUIS	Mauritius	Jeddah	Saudi Arabia	Edinburgh	United Kingdom
GUADALAJARA	Mexico	Riyadh	Saudi Arabia	Glasgow	United Kingdom
Mexico City	Mexico	Dakar	Senegal	Leeds	United Kingdom
Monterrey	Mexico	Dar es Salaam	Senegal	Liverpool	United Kingdom
SAN PEDRO GARZA GCIA	Mexico	Freetown	Sierra Leone	London	United Kingdom
Tijuana	Mexico	Singapore	Singapore	Manchester	United Kingdom
TORREON	Mexico	Bratislava	Slovak Republic	Newcastle	United Kingdom
XALAPA	Mexico	PRESOV	Slovak Republic	Nottingham	United Kingdom

ANNEX C: LIST OF CITIES IN THE KLM DATABASE (contd.)

CITIES	COUNTRY
Alexandria	United States
Atlanta	United States
Baltimore	United States
Boston	United States
Buffalo	United States
Charlotte	United States
Chicago	United States
Cincinnati	United States
Cleveland	United States
Columbus	United States
Dallas	United States
Denver	United States
Detroit	United States
Houston	United States
Kansas City	United States
Los Angeles	United States
Miami	United States
Minneapolis	United States
New Orleans	United States
New York	United States
Philadelphia	United States
Phoenix	United States
Pittsburg	United States
Portland	United States
Richmond	United States
San Diego	United States
San Francisco	United States
San Jose	United States
Seattle	United States
St Louis	United States
Washington	United States
Wilmington	United States
Montevideo	Uruguay
Tashkent	Uzbekistan
Caracas	Venezuela
BIENHOA	Vietnam
Hanoi	Vietnam
HO CHI MINH	Vietnam
Sana'a	Yemen
BABEBO	Yugoslavia
Belgrade	Yugoslavia
KRALJEVO	Yugoslavia
NIS	Yugoslavia
NOVI SAD	Yugoslavia
SR.MITROVICA	Yugoslavia
SUBOTICA	Yugoslavia
UZICE	Yugoslavia
KITWE	Zambia
Lusaka	Zambia
NDOLA	Zambia
Bulawayo	Zimbabwe
Harare	Zimbabwe