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Uneven geographies of organizational practice: explaining  
the cross-national transfer and diffusion of ISO 9000

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# Uneven geographies of organizational practice: explaining the cross-national transfer and diffusion of ISO 9000

## REVISED VERSION

### **Abstract**

There is growing recognition that organizational innovations can have a major influence on the geography of economic activity. Yet, very little is known about the mechanisms and geographic preconditions underlying their diffusion, particularly at the global level. In this paper we seek to fill this gap using the example of ISO 9000, the internationally-recognized set of standards for quality management. We develop a series of hypotheses about the conditions under which organizations are most likely to adopt ISO 9000 which we test using panel data for 130 countries over the period 1995-2001. Our findings support the idea that transnational networks connecting different countries at the international level provide conduits for the cross-national transfer of new organizational practices. Thus, exports to the EU, local involvement of transnational corporations (TNCs), European colonial ties, and the availability of telecommunications, all emerge as statistically significant determinants of ISO adoptions. Our findings also underscore the importance of national environmental conditions in influencing the receptiveness of organizations to new practices. Low regulatory burden, a high share of manufacturing activity, high rates of secondary school enrolment, and low levels of productivity, are positively correlated with the number of ISO 9000 certificates. The paper concludes by discussing the implications of our findings for current debates about the mechanisms, preconditions and scales of organizational transfer, diffusion and convergence.

**Keywords:** ISO 9000, standards, cross-national diffusion, globalization, institutionalism

## **Introduction**

The aim of this paper is to explain cross-national variations in the diffusion of ISO 9000, a series of voluntary private standards, developed and promoted by the Geneva-based International Organization for Standardization (ISO). The standards define procedures for quality management and are intended to provide external assurance of quality to customers.

Following their release in 1987 take-up of ISO 9000 advanced most rapidly in the European Union (EU). Many other developed and developing countries have since adopted the standards such that by December 2001, the end of our study period, 161 countries were host to ISO 9000 certified facilities. Yet, despite its geographic spread, the number of certified facilities remains highly uneven across the globe.

For geographers such cross-country variations in the take-up of ISO 9000 are of particular interest. This is because they provide a unique opportunity to investigate the factors shaping the cross-national transfer, diffusion and convergence of organizational innovations at the global level. There is growing recognition that such innovations – ideas, practices, strategies, etc. – can have a profound influence on the geography of economic activity. Thus, productivity levels, competitiveness, firm structure, buyer-supplier relations, and the geographical distribution of supply chains, are all shaped by organizational innovations (Storper 1987; Alänge, Jacobsson and Jarnehammar 1998; Thrift 1998; Bryson 2000; Bathelt and Glückler 2003; Sturgeon 2003).

Yet, despite their obvious importance, relatively little is known about the mechanisms and geographic preconditions underpinning the diffusion of organizational innovations (Gertler 2001). This gap is particularly acute at the global scale. Thus, while a number of studies have examined the cross-national transfer of corporate practices, these have largely been based on

case-study evidence drawn from a small number of nation-states (Florida and Kenney 1992; Gooderham, Nordhaug and Ringdal 1999; Kollman and Prakash 2001; Clark, Mansfield and Tickell 2002). What is more, few of these studies have sought to identify generic facilitators and/or barriers (Sturdy 2001), focusing instead on nationally idiosyncratic institutions promoting and/or inhibiting acceptance of “imported” ideologies, practices and strategies (Pauly and Reich 1997; Argent 2002; Christopherson 2002). In fact, only a handful of studies have empirically investigated the cross-national transfer of organizational innovations at the global scale, with the result that many questions remain unanswered about the generic mechanisms and preconditions for organizational convergence.

A major reason for this gap in the literature is the lack of reliable data. Unlike many technological innovations – steel furnaces, telecommunications, etc. (Perkins and Neumayer 2004b) – little comparable data exist on the take-up of organizational innovations across multiple countries. An important exception is ISO 9000. The International Organization for Standardization (ISO) has collected data on national certification counts since 1993, providing valuable insight into the cross-national diffusion of organizational practices at the global scale.

Given this coverage it is perhaps surprising that only one previous study has investigated the global diffusion of ISO 9000. Adopting a new-institutionalist framework, Guler, Guillén and Macpherson (2002) use regression analysis to examine the influence of several hypothesized factors on national certification counts. The authors find that the number of ISO 9000 certificates is positively correlated with levels of inward foreign direct investment, government consumption, wealth and size of the labor force. Moreover, suggesting that organizational practices diffuse within networks of social influence, they find that countries which enjoy close

trade ties and/or are similar in terms of the products they trade are more likely to have a similar number of ISO 9000 certificates.

In this paper we follow a similar approach. Yet we extend their analysis in three important ways. First, whereas Guler, Guillén and Macpherson hypothesize that the uptake of ISO 9000 is primarily governed by institutionalized pressures for organizational conformity, our analytical framework recognizes that adoption decisions may additionally be influenced by efficiency motives. Besides social influence through network ties, therefore, we test for the influence of several geographic factors hypothesized to influence the profitability of ISO 9000 certification. Second, in contrast to Guler, Guillén and Macpherson, we use a lagged dependent variable. This facilitates identification of the geographic determinants of adoption by helping us to control for self-reinforcing bandwagon dynamics. And third, our dataset includes a far larger number of countries (N=130), providing a more globally-representative test of the determinants of organizational diffusion. Data limitations mean that Guler, Guillén and Macpherson are forced to omit a substantial number of countries from the analysis (N=85), opening-up the possibility of sample selection bias in their estimations.

The rest of the paper is organized as follows. Section 2 outlines the origins, nature and requirements of ISO 9000. Section 3 briefly reviews the existing theoretical literature on the diffusion of technological and organizational innovations. Section 4 develops a series of hypotheses regarding the determinants of national certification counts. Section 5 describes data and methods used in the study and Section 6 presents results. Discussion and conclusions are provided in Section 7.

## **The nature and implications of ISO 9000**

One of the defining features of the global business environment over the past two decades has been the emergence of quality as a key factor in competitive success (van der Wiele, Dale and Williams 2000; Withers and Ebrahimpour 2000). Accompanying this so-called “quality revolution” has been a succession of organizational innovations designed to assist firms in quality management. Originally these innovations – for example, quality circles, total quality management (TQM), just-in-time (JIT), etc. – were based on loosely codified principles articulated by consultants and management texts. More recently, however, standardized systems of quality management have been developed, first at the national level, and subsequently the international one.

The emergence of quality management standards has not taken place in isolation. Rather, they are part of a broader trend towards governance through standardization (Abbott and Snidal 2001; Sturgeon 2003). This trend has been especially pronounced at the global level where growing cross-border economic integration has heightened the need for common standards to facilitate co-operation and co-ordination between firms. In the absence of a global state the task of designing, implementing and enforcing standards has increasingly been taken-up by various regional and/or global institutions. Some of these are governmental organizations. Many others, however, are non-governmental. Their involvement in standard-setting has gone hand-in-hand with a more general shift towards private sector involvement in areas of governance traditionally occupied by the state (Brunsson and Jacobsson 2000; Coe and Yeung 2001; Sassen 2001).

The International Organization for Standardization (ISO) is the largest and perhaps best-known private standard-setting body at the global level. Comprising national standard institutes

from 130 countries, its overarching goal has been to facilitate international trade and investment by harmonizing otherwise diverse and conflicting national standards with international ones (Stevenson and Barnes 2001). The majority of the ISO's standards are technical in nature, defining the specifications that various products should possess. The ISO 9000 series, by contrast, are procedural standards. Rather than standardizing technical specifications, the standards define a comprehensive set of quality management practices. Their chief purpose is to provide external quality assurance to customers by demonstrating a supplier's compliance with a formalized quality management system.

The ISO 9000 series was originally released in 1987 and subsequently revised and updated in 1994 and 2000. The series comprises five individual standards. Two of these, ISO 9000 and ISO 9004, are so-called guidance standards designed to assist applicants of ISO 9000 in quality system improvement. While the other three, ISO 9001, ISO 9002 and ISO 9003, are contractual standards. They define the basic requirements for establishing, maintaining and documenting a certifiable quality management system. As of December 2000, these three standards were replaced by a single one, ISO 9000: 2000. A parallel set of procedural standards for environmental management systems, ISO 14000, were released in 1996.

ISO 9000 is based on a number of principles for achieving quality. These principles – for example, customer satisfaction, continual improvement and preventive action – are highly generalized allowing ISO 9000 to be readily adapted to the needs of a wide range of organizations, regardless of their function, ownership or size (Casper and Hancke 1999; Furusten 2000). Applicants wishing to become certified to a chosen standard must first undergo an audit. Administered by an approved third-party registrar the audit verifies whether the facility's operations comply with the documented procedures described in its quality management system.



Subject to a satisfactory inspection a certificate is issued by the registrar qualifying the organization to declare itself ISO 9000 accredited. Periodic surveillance audits are required to ensure continued compliance with the standards (Mendel 2002).

The business value of ISO 9000 has been extensively debated in the management literature (Dick 2000; van der Wiele, Dale and Williams 2000; Stevenson and Barnes 2001). Supporters point to several benefits accruing to ISO 9000 certified organizations. First and foremost, these include external benefits of increased customer satisfaction and market share, followed by internal benefits in terms of improved operational efficiency and productivity. In fact, despite being conceived primarily as a tool for achieving external quality assurance, firm-level surveys reveal that the internal benefits enjoyed by certified companies are often greater than external ones (Larsen and Häversjö 2000). Critics, however, have questioned the alleged benefits of ISO 9000. They point to the high financial costs of certification. They also question whether the standards actually contribute to improved product quality and market competitiveness. Suffice to say, while many studies find a positive correlation between certification and business performance (e.g., Withers and Ebrahimpour 2000), several others find that ISO 9000 has little or no impact on long-term profitability (e.g., Wayhan, Kirche and Khumawala 2002). Perhaps unsurprisingly, therefore, doubts persist over the efficiency of the standards.

What is clear, however, is that ISO 9000 has proved a spectacular success. At the end of 2001, the end-year of our study period, more than 510,000 certificates had been issued in 161 countries across the globe. Yet a striking feature of certification activity is its geographically uneven distribution. Europe and the Far East regions are host to the largest number of certificates and account for the bulk of the world's total – see table 1. On a country basis, with more than

66,000 certificates, the United Kingdom has the highest number of ISO 9000 certified facilities, followed by China with over 57,000. Several EU countries, Japan, the United States, Australia and South Korea also feature in the top 10 – see table 2. A number of rapidly industrializing countries in Asia and Latin America also have comparatively high national ISO 9000 counts. Elsewhere enthusiasm for the standards has been far lower. Iran, for example, has only 618 certified facilities to its name and Bangladesh a mere 38. Relative to population size, Australia has the highest number of ISO 9000 certificates, followed by the UK and various other EU member states. A handful of smaller countries, including Israel and Singapore, also have high per capita certification counts.

< Insert Tables 1 and 2 about here >

The goal of this paper is to explain these variations in national certification counts, and in doing so, advance current understanding of the mechanisms and geographic preconditions underpinning the uneven transfer, diffusion and convergence of organizational innovations at the global level. To achieve this, we depart from previous cross-national diffusion studies, based largely on qualitative evidence drawn from a handful of nation-states. Instead, our paper takes a quantitative approach, and uses econometric techniques to estimate the influence of several hypothesized variables on certification counts for a sample of 130 countries.

Before proceeding to develop our theoretically-derived hypotheses, it is important to note that ISO 9000 is a very specific type of organizational practice, meaning that our findings may not be fully generalizable to other ideas, practices and strategies that help to shape the geography of economic activity. In particular, because its content and implementation are standardized in a

set of written rules, we might expect ISO 9000 to be more geographically mobile than less codified organizational innovations<sup>1</sup>. The central importance of customer requirements as a motive for adoption (Anderson, Daly and Johnson 1999) additionally suggests that market actors are likely to play an unusually important role in inter- and intra-country diffusion patterns. Still, we believe that our study makes a valuable contribution to the existing literature, providing more generalizable insights into the world-wide spread of new organizational practices.

### **Insights on the diffusion of organizational innovations**

A number of distinct theoretical perspectives dominate the diffusion literature. Broadly speaking, however, they can be divided into two streams. The first, commonly referred to as the efficient-choice approach, argues that adoption decisions are based on the performance and/or profitability of innovations (Davies 1979; Rosenkopf and Abrahamson 1999). Variants of this approach assume different levels of information. Yet they all model decision-makers as rational, calculative agents who select among alternatives according to their efficiency.

The second set of approaches, widely associated with the new-institutionalism in economic sociology, reject the idea of profitability and/or performance as the primary motive behind the adoption of innovations. Although accepting that early adoption decisions may be influenced by efficiency considerations, they argue that later adopters are characteristically driven by a range of social pressures to adopt similar organizational practices. These may have little to do with enhancing economic and/or technical performance, but rather, maintenance of external legitimacy.

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<sup>1</sup> The growing trend towards standardization of product and process requirements (e.g., see Sturgeon 2003),

In a seminal piece, DiMaggio and Powell (1983) describe three such social pressures – coercive, mimetic and normative – which shape the demand for innovations and produce organizational convergence. Coercive pressures operate where firms are ‘...compelled or mandated through regulation or exchange’ (Mendel 2002, p48) to conform to specific practices. Mimetic isomorphism arises where organizations imitate the behavior of others (Haveman 1993; Rosenkopf and Abrahamson 1999). While normative pressures refer to the influence of professionals who define norms of rational action, and prescribe “best practice” solutions (Galaskiewicz and Wasserman 1989; Abrahamson 1996).

Institutionalist, inefficient-choice approaches dominate the recent literature on the diffusion of organizational practices. In fact, in the only previous study to investigate the global spread of ISO 9000, Guler, Guillén and Macpherson (2002) develop a new-institutionalist framework to model cross-national transfers. Underpinning the choice of neo-institutionalist approaches is the observation that the economic returns from organizational innovation are often ambiguous. Hence, the emphasis on norms, rhetorics and ideologies of “best practice”, which are assumed to shape adoption decisions under conditions of complexity and uncertainty (DiMaggio and Powell 1983).

We agree that institutional pressures are likely to play a leading role in the diffusion of ISO 9000. Besides, their influence has been convincingly documented in a number of recent qualitative and quantitative contributions examining the diffusion of organizational innovations, both within and across nation-states (Zbaracki 1998; Guler, Guillén and Macpherson 2002; Nelson and Gopalan 2003). Yet, we argue that institutionalist approaches are “underrationalized” (Strang and Macy 2001, p156), and that economic considerations are likely to shape the decision to adopt quality management standards. Indeed, recent research appears to support this

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however, suggests that the findings of the present paper are of wider relevance.

interpretation, suggesting that both institutional and efficiency motives may explain diffusion processes involving organizational innovations (Mansfield 1993; Hislop, Newell, Scarborough and Swan 1997; Kogut and Parkinson 1998).

Our analytic framework, therefore, not only recognizes a central role for institutionalized norms, expectations and rules in explaining diffusion patterns. It is also open to the possibility that efficiency might influence adoption decisions. Put simply, while managers can be induced, coerced or regulated to adopt ISO 9000, the extent to which they are receptive to these pressures will partly be a function of profitability. Of course, this does not mean that managers are fully rational, always optimizing agents. They are not (Dicken and Malmberg 2001). Yet it would be surprising if geographic factors influencing efficiency – or indeed the supply of information about profitability and/or performance – did not affect adoption rates.

Combining these perspectives – economic and new-institutionalist – the following subsections outline a series of hypotheses about the conditions promoting and/or inhibiting ISO certification where the unit of analysis is the nation-state. Our hypotheses are divided into two broad categories. The first are concerned with transnational network ties which connect geographically dispersed territories, firms and managers, and provide a conduit for the international transfer of organizational innovations. While the second set of hypotheses are primarily concerned with country-level environmental conditions influencing the receptiveness of firms to new organizational practices.

### **(a) Transnational network ties**

Networks have received growing attention from economic geographers over the past decade. Underlying this interest is recognition that firms are embedded in a complex set of relational networks linking customers, suppliers, and a host of governmental and non-governmental organizations. Networks create opportunities for interaction, learning and influence, and therefore are seen as providing a central context for the production, shaping and transfer of new ideas, knowledge and practices (Gertler 2001; Bathelt and Glückler 2003). Much of the focus of recent work in geography, of course, has been on relational networks at the sub-national level, and specifically, between actors within city-regions (e.g., Florida 1995; Morgan 1997; Keeble and Wilkinson 1999; Benner 2003). Yet there is growing awareness that interactions through networks at the international level also shape patterns of geo-corporate behavior (Amin and Thrift 1992; Clark, Mansfield and Tickell 2001; Coe and Yeung 2001; Dicken and Malmberg 2001; Sturgeon 2003).

One of the most important transnational networks is created by international trade. Although primarily associated with the exchange of goods and services there are two reasons why we might expect trade flows to influence the cross-national transfer of organizational innovations. First, networks of trade connect customers in one country with suppliers in another, and provide a channel for the transmission of coercive supply-chain pressures (Coe and Yeung 2001; Smith 2003). Acting through value chains, Porter (1990) describes how sophisticated and demanding buyers in home markets can act as catalysts for improvements in the product quality, productivity and competitiveness of domestic firms. The exercise of coercive power by influential buyers, and its influence on organizational behavior, has also been observed at the

cross-national level. Thus, Hughes (2000) documents how Kenyan floricultural suppliers are required to meet strict requirements regarding production processes, quality, etc., set by major retail multiples in the UK. Anecdotal evidence suggests that similar supply-chain pressures have been a significant factor in the take-up of ISO 9000. Many certified firms, and especially large and/or multinational ones, routinely specify ISO 9000 as a contractual condition of supply (Casper and Hancke 1999). Hence, for firms exporting a large share of their output, significant incentives exist to adopt the standards. No doubt this explains the results of firm-level surveys suggesting that “market access” and “customer requirements” are lead motives for certification activity (Vloeberghs 1996; Buttle 1997; Ebrahimpour, Withers and Hikmet 1997; Chittenden, Poutziouris and Mukhta 1998).

A second way in which trade might influence the cross-national pattern of organizational practice is by increasing the frequency of formal and informal interactions between actors located in different countries (c.f. Granovetter 1973). These interactions provide opportunities for cross-national learning about the technical performance and/or profitability of specific organizational innovations (Gertler 2001). They also support mimetic-type behavior whereby organizations imitate the practices of others they perceive as especially legitimate and/or successful (DiMaggio and Powell 1983). Through trade-based interactions, firms may learn from, and moreover, emulate, the practices of their high-reputation foreign counterparts (Arias and Guillén 1998).

Taken jointly, these arguments strongly suggest that countries which export a higher share of their output to markets with high numbers of ISO 9000 certificates will themselves have more certificates. One key market in this respect is the EU. Member states such as Sweden, France and Germany were early adopters of ISO 9000 and have since gone on to diffuse the

standards throughout their economic structure. The result is that, despite accounting for a mere 5 per cent of the world's population, the EU 15<sup>2</sup> was host to nearly half of the global number of ISO 9000 certificates in 2001. Given its popularity, we expect firms exporting to the EU to be more likely to learn about ISO 9000 and, furthermore, influenced to adopt ISO 9000 as a model of "best practice." More importantly, perhaps, exporters are likely to face strong demand-side pressures to adopt ISO 9000 from EU customers. Indeed, according to several observers, the formal adoption of conformity assessment procedures by the European Commission in 1989, enabling EU firms '...to reject products or services from companies that are not registered with the ISO' (Withers and Ebrahimpour 2000, p596), made ISO 9000 a *de facto* standard for firms wishing to access the European market (Tanner 1998; Mendel 2002). This interpretation is consistent with Corbett (2002) who finds that supply-chain pressures by early adopters in Europe played an important role in the transfer and diffusion of ISO 9000 to later adopters in other countries and regions. Hence:

*Hypothesis 1. Countries which export a larger share of their goods and services to the EU are likely to have more ISO 9000 certificates.*

Transnational production networks, centered on and around transnational corporations (TNCs) and their subsidiaries, comprise another business network supporting the diffusion of organizational innovations at the global level. Gertler (2001, p11), for example, asserts that, '...foreign direct investment (FDI) constitutes arguably the most active channel available to firms to promote the circulation of new practices.' Supporting such claims is a substantial body of work that documents how transnationals have been instrumental in the transfer, adoption and

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<sup>2</sup> The EU 15 prior to the accession of the 10 new member states in May 2004.



diffusion of new technologies, knowledge and organizational practices in host economies (Florida and Kenney 1992; Li and Yeung 1999; Potter, Moore and Spires 2002; Hayter and Edington 2004).

This work suggests that TNCs accelerate the cross-national transfer and within-country diffusion of new organizational innovations in two ways. First, they contribute to the uptake of new practices directly, deploying “standardized” organizational procedures, structures and strategies throughout their regional and/or global network of operations. Clark, Mansfield and Tickell (2001), for example, describe how a growing number of German TNCs are implementing common accounting standards, both in their domestic and overseas operations. A similar process may account, in part, for the global spread of ISO 9000. Reports indicate that many large TNCs have adopted ISO 9000. Moreover, they are adopting the standards on a corporate-wide basis, since ISO 9000 offers a flexible and widely-accepted system of quality management and assurance (Yahya and Goh 2001; Mizuno 2002).

A second way in which TNCs influence the spread of new organizational practices is by acting as a catalyst for adoption by domestic firms. As influential, and potentially demanding, buyers of goods and services (Porter 1990; Potter, Moore and Spires 2002; Hayter and Edington 2004), transnationals can prompt uptake directly, compelling local suppliers to meet specific procedural standards. For example, Ivarsson and Alvstam (2004), describe how, as a qualifying criterion, Volvo’s components suppliers are required to meet specific standards regarding, amongst other, internal quality systems. Given that TNCs have been at the forefront of adopting ISO 9000, we expect similar requirements to have driven certification activity amongst upstream suppliers.

TNCs might also stimulate certification among domestic firms by acting as normative models of “best practice”. Transnationals’ size, observability and profitability mean that they are more likely to be seen as legitimate and/or successful (Haveman 1993). Managers of domestic firms may imitate ISO 9000 certification by TNCs, therefore, in order to associate themselves with the strategic choices of these high-reputation counterparts (Abrahamson 1996). Similarly, interacting with local TNC affiliates and/or subsidiaries, domestic firms may learn about the existence and/or benefits of ISO 9000. Supporting this idea, Potter, Moore and Spires (2002) find that the informal sharing of ideas, views and information is a central mechanism through which new practices have diffused from foreign investors to domestic firms in the UK manufacturing sector.

Through these processes, therefore, the local involvement of transnationals is likely to be conducive to the diffusion of ISO 9000. Indeed, previous cross-country evidence corroborates this thesis, finding a positive statistical relationship between certification of both ISO 9000 and ISO 14001 and inward investment by TNCs (Guler, Guillén and Macpherson 2002; Neumayer and Perkins 2004). Hence:

*Hypothesis 2. Countries with more inward investments by TNCs are likely to have a higher number of ISO 9000 certificates.*

Of course, it is not only contemporary linkages that potentially influence patterns of diffusion, but also historical ones. Arias and Guillén (1998, p115) note that historical interdependencies have largely been overlooked in the existing literature on cross-national diffusion. Yet, given the durable nature of economic, social and political institutions (Gertler

1995), there are sound reasons to suppose that they will continue to influence the transfer of organizational innovations across national borders.

Particularly significant in this respect is colonialism, experienced by all but a handful of today's developing economies. Although the majority of colonies have since gained independence there is plenty of evidence to suggest that they continue to enjoy close economic, political and social ties with former colonial powers. Neumayer (2003), for instance, demonstrates that patterns of bi-lateral aid remain heavily influenced by former colonial linkages. These and other ties are likely to prove important channels for organizational diffusion across national boundaries, particularly from developed to developing countries, reflecting the unequal power relations '...between colonizer and colonized, dominator and dominated in the world system' (Frenkel and Shenhav 2003, p1541). Arias and Guillén (1998), for example, describe how the exchange of students, managers and professionals as part of bi-lateral aid schemes during the post war-period, led to the transfer of economic practices from Europe and the US to developing countries.

Applied in the present context, these insights suggest that we should expect ex-colonies of developed economies with high numbers of ISO 9000 certified facilities to have a higher number of certificates. In practice, this points to former colonies of EU member states, and especially ones which were under colonial control for a prolonged period of time. As shown in table 1, the European region is host to over half of the world's ISO 9000 certificates, and moreover, was a pioneer in early diffusion of the standards. Therefore, we expect:

*Hypothesis 3. Countries which spent a longer period under European colonial rule are likely to have a higher number of ISO 9000 certificates.*

At a more general level we expect the cross-national transfer and diffusion of new organizational innovations to be influenced by the extent to which social actors in one country communicate with their counterparts in others. Empirical work has shown that early adopters are characteristically more cosmopolitan than late adopters (Rogers 1995). By interacting with a wider range of actors outside their immediate social system cosmopolitan actors are more likely to be exposed to informational and/or social influences promoting adoption (O'Neill, Poudier and Buchholtz 1998). Extending these insights to cross-national diffusion processes involving organizational innovations suggests that the transfer and adoption of ISO 9000 will be shaped by the availability of cross-country communications media. Access to telephones, faxes, the internet, etc., increases the likelihood of interactions between adopters and potential adopters in different nation-states, and therefore, distanced learning (Guillén 2001; Amin and Cohendet 2004). Indeed, given that there are no internationally-recognized substitutes to ISO 9000, we expect generic communications channels to assume particular importance in the worldwide spread of the standards:

*Hypothesis 4. Countries with a greater availability of telecommunications media are likely to have a higher number of ISO 9000 certificates.*

#### **(b) Characteristics of the national environment**

Organizational innovations not only diffuse between nation-states but also within them (True and Mintrom 2001). As well as transnational networks, therefore, we expect the characteristics of the national environment to influence their geographic spread. Of particular importance in this

respect is the state. Despite the popular image of policies, practices and strategies being imposed from above by global actors, there is growing recognition that the state retains considerable influence in shaping the trajectory of organizational convergence (Argent 2002; Park 2003). The state can resist homogenizing pressures by, for example, mandating compliance with national (as opposed to international) standards of organizational practice. Alternatively, it can actively support the import and diffusion of foreign practices by, for instance, providing relevant information, training and financial support to potential adopters (Arias and Guillén 1998). The available literature strongly supports the idea that the state has had a major influence in the context of ISO 9000. Driven by the belief that ISO 9000 certification can enhance industrial competitiveness, governments have encouraged take-up of the standards. In this capacity, they have offered firms technical and/or financial assistance, primarily to lower the economic costs of implementation and registration (Mizuno 2002). They have also advanced ISO 9000 as a model of “best practice” using promotional material – brochures, seminars, etc. – highlighting “success stories” of efficient adoptions (Mendel 2002).

State actors have also created coercive pressures for certification. This process began in 1989 when the EU took the pioneering decision to incorporate ISO 9000 into its “Global Approach to Testing and Certification”, and subsequent “New Approach Directives”. By permitting manufacturers to meet conformity requirements using ISO 9000, the Commission provided a powerful incentive for certification among European firms, as well as their suppliers (Mallak, Bringelson and Lyth 1997; Anderson, Daly and Johnson 1999; McCalman, Wilkinson and Brouthers 2000). Evidence suggests that governments in other countries have since gone on to list the standards in their conformity assessment procedures. A growing number have also incorporated ISO 9000 into public-sector procurement guidelines (Beattie and Sohal 1999). For

these reasons, we anticipate that countries whose governments are more involved in the economy in terms of government consumption, governmental production of goods and services, and government ownership of production facilities, will have a higher certification count. Hence:

*Hypothesis 5. Countries with high levels of government involvement in the economy are likely to have more ISO 9000 certificates.*

Yet the state's influence on the diffusion of new organizational innovations is potentially ambiguous. While governments can provide positive incentives to “download” and diffuse new practices through, for example, procurement specifications, they can also indirectly deter their uptake. Thus, where government intervention negatively impacts financial returns – for instance, because firms are subject to an elaborate, complicated and burdensome regulatory process – organizations are unlikely to make significant, long-term investments. The same is to be expected where governments increase investment uncertainty through the uneven application of regulations and/or corruption. Conversely, where the regulatory burden on firms is comparatively low and/or regulations are applied in a uniform way, firms are more likely to make large investments in new organizational practices. This includes ISO 9000 which involves a substantial up-investment, and moreover, one whose returns are likely to be realized over the longer-term (Bierão and Sarsfield Cabral 2002). Hence:

*Hypothesis 6. Countries with a lower regulatory burden imposed on the private economy are likely to be hosts to a larger number of ISO 9000 certificates.*

More generally, by influencing the real and/or anticipated financial returns from efficiency-enhancing organizational practices, we expect productivity levels to impact certification activity. Although market requirements routinely emerge as the lead motive for ISO 9000, surveys reveal that “productivity” and “efficiency” are significant reasons for seeking certification (Buttle 1997). Productivity motives are likely to be especially important among organizations characterized by low levels of productivity. Such organizations are unlikely to have exploited many low-cost, high-return investments in operational efficiency. Consequently, we predict that they will earn a higher financial return from ISO 9000, which is well-suited to identifying and realizing productivity-enhancing investment opportunities:

*Hypothesis 7. Countries with lower levels of productivity are likely to have a higher number of ISO 9000 certificates.*

Organizational resources are another factor known to influence the adoption of new practices (Florida, Atlas and Cline 2001). These include, of particular significance, human capital. Firms with better-educated workforces are not only more likely to have knowledge of new organizational practices, but are likely to find it cheaper to implement them. As noted above, the procedural requirements of ISO 9000 are extensive, particularly in terms of planning, monitoring and documentation. Hence, we anticipate the profitability of ISO 9000 to be sensitive to educational levels, with poorly educated workforces finding it especially difficult and costly to achieve certification:

*Hypothesis 8. Countries with higher education levels are likely to have a higher number of ISO 9000 certificates.*

The receptiveness of firms to specific organizational practices, strategies and standards is also likely to depend on their economic sector. Certain innovations will clearly be of greater value to organizations in some economic sectors than others. ISO 9000, for example, is likely to be of most benefit to manufacturing firms. The importance of quality to the safety, reliability, etc., of their output means that manufacturers are often subject to coercive pressures from upstream buyers. Markets for many manufacturing goods, and especially standardized and/or internationally-traded ones, are also highly price competitive. As a result, manufacturing firms face especially strong pressures to cut costs, providing an additional motive for adopting efficiency-enhancing organizational practices. This is likely to favor ISO 9000 which, in addition to improving product quality, is well-suited to identifying and realizing cost-savings through operational improvements (Larsen and Häversjö 2000). Together, this suggests that ISO counts will be higher in manufacturing-based economies, a predication supported by reports suggesting that certification activity has proceeded most rapidly in the industrial sector (Chittenden, Poutziouris and Mukhta 1998; Acharya and Ray 2000; Brown 2004):

*Hypothesis 9. Countries with a greater share of manufacturing in GDP are likely to have more ISO 9000 certificates.*



## Research Design

Our dependent variable is the number of ISO 9000 certified facilities at the national level (ISO 2001, 2002) normalized by population size in order to make counts comparable across different-sized countries (*ISO9000PC*). National ISO certification counts are available from 1993 onwards. We lose the first year due to the inclusion of the lagged dependent variable in the regressions. Moreover, since 1993 and 1994 data refer to mid- rather than end-of-year, we restrict our sample to the period 1995-2001, all of which refer to end-year counts.<sup>3</sup> Data for ISO 9000 are available for 2002, but many of our explanatory variables are not, with the result that we are forced to omit this year from the analysis.

To test the influence of transnational network ties on national certification counts we use four explanatory variables. The first is the value of exports of goods and services to the then 15 EU member states relative to the exporting country's gross domestic product (*EU15EXPGDP*). For EU countries, this variable refers to exports to the other 14 EU states. These data are taken from OECD (2003). The second variable is the stock of FDI relative to GDP (*FDISTOCKGDP*) as reported by UNCTAD (2003). FDI stock is a better measure of the overall level of TNC involvement in host economies than potentially volatile annual FDI inflows and therefore is well-suited to testing our research hypothesis. Our third explanatory variable measures the number of years a developing country has been under European colonial rule between 1900 and 1960 (*COLONY*) as documented by Alesina and Dollar (2000). And fourth, we use the number

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<sup>3</sup> For the year 1995, we include the lagged value of the dependent variable from mid-1994, however, in order to avoid a further reduction in sample size.

of main telephone lines per 100 inhabitants (*TELEPHONESPC*) as a proxy for the availability of telecommunications, with data taken from ITU (2003).

Characteristics of the national environment are captured by a set of five variables. First, we use a sub-component of the Heritage Foundation's (2003) Index of Economic Freedom, which ranks countries on a one-to-five scale according to general government involvement in the economy (*GOVINVOLVEMENT*). Countries are graded with respect to: (a) the level of government consumption as a percentage of the economy; (b) the extent of government ownership of businesses and industries; (c) the share of government revenues from state-owned enterprises; (d) government ownership of property; and (e) economic output produced by the government. Higher values imply greater government involvement. Whilst this variable measures general government involvement, another sub-component of the Index of Economic Freedom provides a measure of the regulatory burden imposed on private businesses (*REGBURDEN*), again ranked on a one-to-five scale. A country is rated one if existing regulations are straightforward and applied uniformly to all businesses and corruption is nearly nonexistent. While, at the other end of the scale, a rating of five is reserved for countries where the government impedes the creation of new businesses, corruption is rampant and regulations are applied randomly.

The third variable in this group uses gross secondary school enrolment ratio as a proxy for the national level of education (*%SECONDEDUCATION*). These data are taken from World Bank (2003) and UNESCO (2003). Ideally, we would have liked to use a variable that measured the educational status of the workforce directly. However, the only measure fitting this description has very poor cross-country availability, meaning that we resort to secondary school enrolment. The manufacturing share of GDP (*%MANUFACT*), the fourth variable, is taken from

World Bank (2003) and is complemented by data provided by CIA (2002). For our measure of economic productivity we use GDP in purchasing power parity (PPP) divided by the size of the labor force (*GDPPERWORKER*). All data are from World Bank (2003).

Finally, as an additional control variable, we include total GDP in PPP (*GDP*). In the absence of data on the number of facilities in a country, we realistically assume that the number of potential adopters is a functional of total economic size. Countries with more facilities are also more likely to host innovative, early-adopters who experiment with ISO 9000 and subsequently influence others to adopt the standards (Rogers 1995). Table 3 provides summary descriptive variable information. One might be concerned about potential multicollinearity problems. However, variance inflation factors were computed and did not suggest reason for concern (the average factor is only 2.91).

< Insert Table 3 about here >

We estimate the following model:

$$\ln y_{it} = \alpha + \beta_1 \ln y_{it-1} + \beta_2 x_{it} + \gamma_t T_t + v_{it}.$$

The subscript *i* represents each country in year *t*, *y* is the number of ISO 9000 certifications and *x* is the vector of explanatory variables. The dependent variable is logged in order to reduce heteroscedasticity and render its distribution less skewed. To do so, we are forced to add one to the absolute number of ISO 9000 counts, since the log of zero is undefined. As concerns the explanatory variables, we had to take the log of the total GDP variable. Its distribution is

extremely skewed and its relation to ISO 9000 counts is log-linear, suggesting that the number of certifiable firms increases with total economic size, but at a decreasing rate.<sup>4</sup> The year-specific dummy variables  $T$  capture general developments such as rising worldwide levels of awareness about the standards and correct for unobserved time effects. The  $v_{it}$  is a stochastic error term. We estimate equation (1) with Beck and Katz's (1995) popular and commonly applied time-series cross-sectional estimator with panel-corrected standard errors. The error term is presumed to be heteroskedastic and contemporaneously correlated across countries. Beck and Katz (1995) provide Monte Carlo evidence that this estimator typically produces more conservative estimates of standard errors than the alternative estimator, feasible generalized least squares (FGLS). The time dimension is somewhat shorter than in typical applications of Beck and Katz's estimator. However, employing a random-effects estimator instead leads to practically identical results.<sup>5</sup>

The use of a lagged dependent variable has several advantages. First, and most importantly, it allows us to control for self-reinforcing diffusion dynamics, whereby the number of previous adoptions positively influences subsequent ones (Rosenkopf and Abrahamson 1999). Such dynamics are well-documented (Guler, Guillén and Macpherson 2002; Neumayer and Perkins 2004; Perkins and Neumayer 2004a) and are likely to have a major impact on the geographic pattern of ISO 9000 certification. Second, by using a lagged dependent variable, we are able to substantially reduce any autocorrelation. And third, the lagged dependent variable is correlated with potentially omitted variables. No econometric model is ever complete and several potential determinants of ISO 9000 certification are difficult to capture. Inclusion of the lagged

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<sup>4</sup> If not entered in logged form, total GDP would be negative and significant, which makes no sense.

<sup>5</sup> Unfortunately, we cannot employ a fixed-effects estimator since there simply is not enough over-time variation in the data. The major variation is cross-sectional.

dependent variable thus tends to mitigate potential omitted variable bias (Finkel 1995). We have data available for a large panel of 130 countries. Table 4 lists the countries included in the sample.

< Insert Table 4 about here >

## **Results**

Table 5 presents our estimation results. As expected, the lagged dependent variable is positive and highly statistically significant, the inclusion of which also accounts for the high R-squared value. That is, our estimations suggest that the number of past ISO 9000 adoptions has a major impact on subsequent certification activity, a finding consistent with the idea that patterns of geo-corporate change are cumulative and path-dependent (Coe and Yeung 2001; Bathelt and Glückler 2003). Although our results say nothing about the underlying drivers of this relationship, it is most likely the product of bandwagon-type dynamics. Thus, a larger user base will most likely enhance the supply of information about ISO 9000, increasing the probability of non-adopters learning about the standards. While accumulated experience of ISO 9000 is likely to reduce the implementation costs for late-adopters, raising the profitability of the standards, and the economic incentive to certify. Similarly, coercive pressures to adopt ISO 9000 are likely to grow with the number of certificates, as a growing population of certified firms place contractual requirements on their domestic suppliers.

Still, the estimated coefficient of the lagged dependent variable is below one, suggesting that the spread of ISO 9000 is not simply driven by self-reinforcing bandwagon dynamics. Other

factors are clearly important in the geographic pattern of ISO 9000 certification. One is the size of the economy. We estimate that larger economies, as measured by GDP, have more ISO 9000 certified facilities. Given that bigger economies are likely to have a greater number of potential adopters of quality management systems than smaller ones this result makes sense.

Our econometric estimations also strongly support the idea that transnational network ties have influenced the uneven transfer and diffusion of ISO 9000 at the global level. As anticipated, exports to the EU 15 (*EU15EXPGDP*) and the FDI stock (*FDISTOCKGDP*) are found to be positively and statistically significantly correlated with national ISO 9000 counts. Stated differently, countries more integrated into the global economy – via international trade and investment – are likely to have more certified facilities. These results are broadly consistent with Guler, Guillén and Macpherson (2002), who similarly estimate that trade and investment patterns influence the geography of certification, but derive from a more globally-representative sample of 130 countries.

Our econometric estimations do not tell us why European export-orientation and exposure to international investment encourages firms to adopt ISO 9000. Yet, based on the available case-study evidence, we suspect two underlying drivers. The first, and most important, is coercion. Contractual requirements imposed by business customers are likely to have provided a major impetus for certification. As noted above, many large TNCs have adopted ISO 9000, and moreover, are requiring their suppliers to certify to the standards. Hence it makes sense that countries with a larger stock of FDI should have more ISO 9000 certificates. Similarly, the high number of ISO 9000 compliant firms, together with the formal incorporation of the standards into the EU's conformity assessment procedures, strongly suggests that exporters to member states are likely to face strong pressures to certify to ISO 9000. These market-based pressures

most likely explain the higher number of certificates in countries that export a higher share of their output to the EU.

A second set of drivers potentially explaining the influence of export ties and inward direct investment are informational and ideational in nature. Interacting with ISO 9000 certified buyers in the EU, and/or certified TNCs in host economies, managers are likely to learn about the existence, benefits and/or profitability of the standards, potentially stimulating certification activity (Gertler 2001; Guler, Guillén and Macpherson 2002). Alternatively, domestic managers may mimic their EU and/or multinational counterparts with whom they interact, adopting ISO 9000 in order to align themselves with externally-defined norms of “best practice” (Abrahamson 1996). Previous case-study research suggests that these mechanisms are important vehicles for the diffusion of new ideas, knowledge and practices (Hughes 2000; Potter, Moore and Spires 2002) and there is little to suggest that they have not also been influential in the geographical spread of ISO 9000.

Providing further empirical support for the assumed importance of transnational networks in the global diffusion of new organizational practices we find that telecommunications and colonial linkages influence the pattern of ISO 9000 certification. Per capita availability of telephones (*TELEPHONESPC*) and the length of time a country has been under European colonial rule are both positive correlates of certification counts (*COLONY*). Again, our estimations do not allow us to draw definitive conclusions about underlying mechanisms, although the results are intuitively plausible. Telecommunications provide an opportunity for potential adopters to learn about organizational practices from adopters in other countries. It is hardly surprising, therefore, that countries with a higher density of telephones have more ISO 9000 certificates. The relationship between certification activity and former European colonial

status is equally plausible. Europe has led in the adoption of ISO 9000, driven, in large part, by the decision by the EU to incorporate the standard into its conformity procedures. Ongoing, and often close, ties between European states and their former colonies are likely to facilitate the transfer of information, norms, etc., regarding the standards, stimulating certification activity in developing countries.

Consistent with our predications, and moving beyond the determinants hypothesized by Guler, Guillén and Macpherson (2002), we additionally find that characteristics of the national environment influence patterns of organizational diffusion. In particular, we estimate a positive and statistically significant relationship between national ISO 9000 counts, enrolment rates in secondary education (*%SECONDEDUCATION*) and share of manufacturing in GDP (*%MANUFACT*); and a negative significant relationship between national ISO 9000 counts, regulatory burden (*REGBURDEN*) and economic productivity ( $\ln$  *GDPPERWORKER*). Drawing causal inferences from these statistical relationships is problematic. However, given that all four factors potentially influence the profitability of certification, we suspect that economic considerations predominate.

Thus, not only are firms with better-educated workers more likely to be aware of the existence of ISO 9000 through, for example, their links with professional associations. More importantly, perhaps, they are likely to find implementing a documented quality management system less costly than their counterparts in countries with a poorly-educated workforce. The negative relationship between productivity and certification is also most likely rooted in the economic returns from adoption. Quality management systems are well-suited to identifying and realizing low-cost, high-return operational improvements. However, because firms in more productive countries will have exploited many of these gains, it makes sense that the potential



economic returns, and hence, willingness of firms to invest in ISO 9000, will be lower under conditions of high productivity.

The economic incentive to adopt ISO 9000 is also likely to be impacted by the style of business regulation. Burdensome, erratic and/or corrupt regulatory interventions by governments reduce the economic incentive to make costly, long-term investments. Therefore, it is hardly surprising that they should act as a deterrent to adopting ISO 9000, whose set-up costs are high and financial returns only realized over the longer-term. Differences in the financial returns from certification may additionally explain why countries with a higher share of manufacturing in GDP have more ISO 9000 certificates. Manufacturing firms are more likely to benefit from cost savings through implementing a quality management systems – via, for example, reduced materials usage – than firms in, say, the financial sector. These offsetting benefits might be expected to increase the willingness of profit-seeking managers to absorb the costs of implementing and certifying ISO 9000. Reinforcing these incentives are supply-chain pressures which are known to be most advanced in the manufacturing sector.

One surprising result is the statistically insignificant and negative coefficient for *GOVINT*. This contradicts our hypothesis which suggested that countries with higher levels of government consumption are likely to have more ISO 9000 certificates. It is also counter to Guler, Guillén and Macpherson (2002) who estimate a positive and statistically significant relationship between ISO 9000 counts and government consumption. What explains this apparent disparity? One possible answer is our larger sample of countries. Data limitations mean that Guler, Guillén and Macpherson (2002) are forced to omit a large number of, presumably, developing countries from their sample. Although consuming a substantial share of GDP there is little evidence to suggest that governments of low-income countries have driven ISO 9000

certification through procurement and conformity requirements. Therefore, while governments may well have driven certification in a number of developed countries, their overall influence at the global level is comparatively small.

< Insert Table 5 about here >

## **Discussion and conclusions**

According to Bryson (2000, p157-158), ‘Central to the geography of economic activity should be an understanding of the transfer of management ideas and techniques into and between companies.’ This paper investigates the mechanisms and geographic preconditions underpinning such transfers at the global level. Using panel data for 130 countries, we use econometric techniques to estimate the influence of several hypothesized variables on adoption of ISO 9000, the internationally-recognized series of quality management standards.

A particular advantage of our quantitative approach is that it allows us to identify generic facilitators and/or barriers involved in the diffusion process. Previous geographical work has done a poor job in this respect. Drawing on case-study evidence from a small number of economies, researchers have principally been concerned with identifying country-specific socio-institutional characteristics that account for the acceptance or, more often, rejection of “imported” organizational innovations (e.g., Christopherson 2002; Argent 2002). The present paper has sought to move beyond this focus on national specificity by performing a much-needed

systematic analysis of organizational diffusion across a large number of developed and developing countries. Of course, our large-sample, econometric approach is constrained by the availability of measurable proxies and, moreover, cannot provide the kind of contextual detail afforded by previous small-sample, qualitative studies. Nevertheless, it usefully complements these approaches, although we wish to stress that our quantitative methodology is in no way superior.

Our results advance current understanding of the mechanisms and geographic preconditions underlying the cross-national transfer and within-country diffusion of new organizational innovations in several ways. First, they confirm the role of networks, and specifically, transnational networks, in the international spread of organizational practices (Hughes 2000; Dicken and Malmberg 2001; Gertler 2001; Smith 2003; Sturgeon 2003). They suggest that relational networks linking actors in different nation-states function as conduits for the transfer of information, norms and coercive pressures and, in doing so, provide a central context for cross-national diffusion of new organizational innovations. The importance of networks, of course, is hardly new to economic geographers. However, while the predominant focus of recent work has been on interaction, learning and influence through social networks at the sub-national level (e.g., Benner 2003), our work points to the possibility of similar processes operating through networks at the international one.

This is not to say that the domestic context is irrelevant. To the extent that the single most important determinant of national certification counts is the pre-existing number of ISO 9000 certificates, the results of our analysis suggest that domestic learning and influence are paramount. Despite the supposed primacy of global forces, patterns of geo-corporate change remain cumulative, path-dependent and predominantly local (Gertler 1995; Coe and Yeung

2001; Bathelt and Glückler 2003). Still, the fact that telecommunications, export ties, and colonial ties all emerge as statistically significant determinants of national certification counts, strongly indicates that distanced learning and influence are real (Amin and Cohendet 2004).

The findings of this paper therefore suggest that proponents of the learning region approach (e.g., Morgan 1997) are right to highlight the central importance of geographic proximity in organizational learning. Yet, by neglecting global ties, they risk under-spatializing the sources of geo-corporate change. Our study points to the need for a multi-scalar perspective, one that recognizes that learning and influence operate on a variety of scales, from local to global (Coe and Yeung 2001; Sturgeon 2003).

Our paper also reinforces the importance of the spatial configuration of networks in the uneven diffusion of organizational practices. Transnational networks are not ubiquitous. Rather, as Cox and Yeung (2001, p375) remind us, ‘...they are highly uneven and embedded in specific places.’ Our econometric estimations suggest that the uneven way in which transnational networks are inserted into territories has an influence on geographic patterns of organizational practice. Thus, inward investment, telecommunications, EU export linkages and colonial ties, all emerge in our study as statistically significant determinants of national ISO 9000 certification counts. Our study therefore contributes to a growing body of relational economic geography emphasizing the importance of networks and, moreover, their inherent spatiality, in explaining the uneven outcomes of economic globalization (Coe and Yeung 2001; Dicken, Kelly, Olds and Yeung 2001; Bathelt and Glückler 2003).

Our empirical analysis also locates a major role for the domestic context in the uneven geography of organizational practice. Again, the idea that national environmental characteristics influence the diffusion of knowledge, ideas and practices is not new. Our specific contribution,

however, is to (re-)emphasize the importance of the economic. Based on the observation that our country-level environmental variables – share of manufacturing in GDP, economic productivity, regulatory burden and human capital – all potentially influence the cost-benefit ratio of certification, we argue that the domestic context is important through its influence on the economic returns to adoption.

This is potentially significant for two reasons. First, it suggests that the influence of the domestic environment is not restricted to institutional variables, widely implicated in previous geographic research as constraining organizational convergence (Pauly and Reich 1997; Argent 2002; Christopherson 2002; Cox 2004). Other, arguably more mundane, characteristics are also important. These include various country-level variables – structure of the economy, level of human capital, and so on – collectively influencing the financial costs and benefits of new organizational practices. Of course, recognizing that economy, culture and society are co-produced, we do not wish to suggest that institutional characteristics do not matter in the uneven global diffusion of new ideas, practices and strategies. They clearly do (Gertler 2001). Nevertheless, our study reinforces recent critiques of the “cultural turn”, cautioning against explanations in economic geography which exclusively privilege the “socio-institutional” over the economic (Martin and Sunley 2001).

The influence of the economic in the diffusion of ISO 9000 is also potentially significant since it challenges existing theories of new-institutionalism. These theories reject the idea of rational, profit-maximizing action and, instead, maintain that take-up of new organizational practices is primarily governed by managers’ quest for legitimacy (Abrahamson 1996). The findings presented in this paper do not entirely contradict this position. Indeed, the influence of, for example, TNCs, suggests that institutionalized pressures for conformity may play an

important role in the spread of new practices. Equally, however, our results suggest that efficiency considerations are also significant. That is, as well as questions of legitimacy, calculative managers may pay attention to economic costs, benefits and profitability in deciding whether or not to adopt new organizational practices.

Taken together, then, our study reinforces the findings of recent studies which suggest that organizational convergence at the global level is both uneven and contingent (Coe and Yeung 2001; Gertler 2001; Cox 2004; Poon and Thompson 2004). No doubt globalization – the intensification of economic, political and social linkages at the international level – has increased the mobility of organizational innovations across national boundaries. Yet, as evidenced by significant variations in take-up of ISO 9000 at the country level, this does not imply cross-national organizational convergence. One reason for these continuing differences, of course, is that the spatial pattern of cross-national interconnection is itself highly geographically uneven. Flows of inward investment into territories, the availability of telecommunications, and so on, vary significantly across the globe. Another reason, and one which resonates with the findings of previous research, is that certain national environments are more favorable to the uptake of organizational innovation than others. In fact, given far-reaching geographic variations in these determinants, it is perhaps unsurprising that spatial unevenness is a persistent feature of organizational transfer, diffusion and convergence at the global level.

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**Table 1**

Regional share of ISO 9000 certifications (in 2001)

Region	No. of certifications	Share of world total (% of absolute numbers)
Africa/West Asia	19,751	3.87
Central and South America	14,423	2.83
North America	50,894	9.97
Europe	269,950	52.87
Far East	126,779	24.83
Australia and New Zealand	28,819	5.65
World	510,616	100.00

*Source:* ISO (2002)

**Table 2**

Top ten countries by ISO 9000 certification count (in 2001)

Country	No. of certifications (absolute numbers)	No. of certifications (per one million inhabitants)	Share of world total (% of absolute numbers)
UK	66,760	1,135.4	13.07
China	57,783	45.5	11.32
Italy	48,109	830.9	9.42
Germany	41,629	505.8	8.15
United States	37,026	129.9	7.25
Japan	27,385	215.6	5.36
Australia	26,750	1,378.9	5.24
France	20,919	353.3	4.10
Spain	17,749	431.8	3.48
South Korea	17,676	373.7	3.46
Total	361,786		70.85

*Source:* ISO (2002) and World Bank (2003)

**Table 3**

Descriptive variable information (N = 899)

Variable	Mean	Std. Dev.	Min	Max
ln ISO9000PC	-4.61	2.23	-6.91	0.32
ln ISO9000PC (lagged)	-5.04	2.41	-11.70	0.26
ln GDP	24.40	1.92	19.64	29.82
EU15EXPGDP	0.01	0.05	0.00	0.59
FDISTOCKGDP	23.99	28.97	0.04	271.57
TELEPHONESPC	19.92	21.32	0.00	78.00
COLONY	23.35	27.45	0.00	60.00
GOVINTERVENTION	2.63	0.85	1.00	5.00
REGBURDEN	3.25	0.89	1.00	5.00
%MANUFACT	17.92	8.99	3.48	60.00
%SECONDEDUCATION	66.70	34.37	5.30	152.70
GDPPERWORKER	15.69	22.98	0.23	132.58

#### **Table 4**

##### List of countries included in sample

Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Canada, Cape Verde, Chad, Chile, China, Colombia, Congo (Rep.), Costa Rica, Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Hong Kong (China), Hungary, Iceland, India, Indonesia, Iran, Ireland, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Laos, Latvia, Lebanon, Lesotho, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Rwanda, Saudi Arabia, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Syria, Tajikistan, Tanzania, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe.

**Table 5**

Estimation results

ln ISO9000PC (lagged)	0.730 (10.18)**
ln GDP	0.084 (4.71)**
EU15EXPGDP	0.700 (4.33)**
FDISTOCKGDP	0.001 (2.07)*
TELEPHONESPC	0.015 (6.77)**
COLONY	0.001 (2.63)**
GOVINTERVENTION	-0.008 (0.65)
REGBURDEN	-0.070 (2.57)**
%MANUFACT	0.009 (8.54)**
%SECONDEDUCATION	0.003 (2.65)**
GDPPERWORKER	-0.003 (2.80)**
Observations	899
Countries	130
Adjusted R-squared	0.95

*Note:* Dependent variable is the logged number of ISO 9000 certifications per million

inhabitants. Absolute z-statistics in parentheses. OLS estimation with panel-corrected standard errors. Constant and year-specific time dummies included, but coefficients not reported. \* significant at .05 level \*\* at .01 level