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Multinational investment and host country development: Location efficiencies for services offshoring

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Abstract

Services offshoring has become an important source of investment and development in many emerging economies. While much attention has been paid to companies' use of services offshoring to lower costs, not all of these offshoring activities have yielded the anticipated results. Thus, the choice of where to locate offshore facilities is an important yet complex one that has substantial implications for both the investing firm and host country. In this paper, we adopt the perspectives of service firms located in the U.S. and empirically examine the attractiveness of host countries for offshoring of services. Using data envelopment analysis (DEA), we examine which countries use their resources or inputs most efficiently in order to produce outputs that make them attractive for services offshoring. We find that China, India, Ireland, the Netherlands, Pakistan, Slovakia, Spain, and the U.K. are particularly attractive locations for services offshoring. All of these countries have at least one core efficiency-creating competency among the key inputs of wages, education, and infrastructure. We discuss implications for firms and government policy makers and offer recommendations for future research.

1. Introduction

Offshoring has emerged as one of the major trends in international business, and has recently become one of the most vigorously debated topics in management (Kotabe & Murray, 2004) and in broader discussions about the future of the global political-economy (Farrell, 2005; Levy, 2005). Offshoring refers to the movement or relocation of domestic firm activities and operations abroad. Offshore investment has also become important to the economic growth and development of the ''white collar'' services economy in countries such as India, Ireland, the Philippines, Jamaica, and others. When the production is also outsourced to an offshore supplier, the phenomenon is typically referred to as offshore outsourcing. While the offshoring of manufacturing has been occurring for decades, the more recent trend of offshoring of services has been attracting greater attention. These services include not only low-value-added activities such as data entry but also high-value-added activities, including architectural design, financial analysis, software programming, human resource services and R&D (UNCTAD, 2005). Global offshoring of services reached about $32 billion in 2001 and offshoring of IT-enabled services alone is estimated to increase from $1 billion in 2002 to about $24 billion by 2007

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(UNCTAD, 2004). Because offshoring can be done internally within companies through the establishment of foreign affiliates or foreign subsidiaries (typically called captive offshoring) (UNCTAD, 2004), as well as externally via outsourcing services to a third-party provider (typically called offshore outsourcing), there is sometimes confusion between the two terms. Since the analysis of this paper can be applied to both captive offshoring and offshore outsourcing, we will use the term "offshoring" in general or "services offshoring" in particular.[3]

Since 2000, advances in technology have enabled offshoring to enter a new phase of very rapid development. Conceptual frameworks for examining recent trends in offshoring have been proposed (Doh, 2005; Graf & Mudambi, 2005; Kotabe & Murray, 2004) but empirical analyses have been generally limited to practitioner and consulting studies (see Farrell, 2005 for an example). In this paper, we adopt the perspectives of service firms located in the U.S. and focus on the location selection decision by empirically examining the attractiveness of 44 developed and developing countries for offshoring services. We first review international business literature relevant to offshoring and the rationale and factors influencing the location selection decision. We compare the location drivers in manufacturing versus services offshoring to derive the input variables we believe will be most important in determining the relative efficiency of services offshoring at the country level. We use this theoretical development to frame our empirical examination of the efficiency of services offshoring in 44 countries using data envelopment analysis (DEA) and present the results of this analysis. Finally, we discuss the implications of our findings for research and practice relevant to both corporate strategy and governmental policy. Our key contribution is the identification of both country-specific core efficiency-producing competencies and also the overall segmentation structure and performance-based partitions associated with the global offshoring market.

2. Literature review and research hypotheses

Research in international business and multinational management has explored the range of factors that contribute to firm-level decision to locate in a particular geographic location (Buckley & Casson, 1976; Dunning, 1988; Porter, 1990). These factors are critical in understanding why some countries are more attractive for investment than others. Surprisingly, there is a paucity of theory directed specifically to the phenomenon of services offshoring. For example, Graf and Mudambi (2005, p. 256) note that "A number of scholars have called for new theory development and empirical research to better understand services internationalization (Contractor, Kundu, & Hsu, 2003; Ekeledo & Sivakumar, 1998)."

2.1. International business theory and offshoring

International trade and international business theory related to the sources of country-level advantages, and analysis of the factors that draw foreign direct investment (FDI) to specific country locations, are relevant starting points for development of such an integrated theory related to country-level efficiencies for services offshoring. Traditional theories of comparative advantage focused on factor endowments as essentially inherited (availability of basic factors of production, like cheap labor or energy, or natural resources). Theories of competitive advantage, as articulated by Porter (1990), argued that states can influence their competitive position by manipulating factor conditions to make them more specialized, promoting domestic competition that increases demand conditions, developing related and supporting industries, and encouraging local rivalry among firms in a given industry. A country's investments in education and infrastructure would provide a more competitive industrial environment by increasing the *quality* of factor endowments, and this, in turn, would stimulate support related and supporting industries, competition, and rivalry.

From the firm's perspective, Dunning's (1977, 1988) eclectic theory of internationalization provides a relevant starting point for analysis of locational determinants for services offshoring. Dunning integrated concepts from economic geography and international business to derive an integrative theory of foreign direct investment. He argued that firms would invest in foreign markets to exploit potential advantages of ownership, location, and internationalization (OLI). Factor advantages would include lower prices for inputs, the availability and quality of resources, and other potential benefits derived from the geographic location of investment. In addition, trade restrictions such as tariffs and quotas, as well as transportation

[3] For services such as finance and accounting, one study found that 69% of large U.S. firms and business process/IT outsourcers used third parties and 31% used a captive model (Duke CIBER/Archstone Consulting, 2005), and that more than 90% of firms used a third-party model for information technology and call centers instead of using a captive model.

costs, could provide incentives for FDI over exporting. Graf and Mudambi (2005) introduced a conceptual model of the location decision for offshore outsourcing of IT-enabled business processes that is based on the OLI paradigm and emphasizes the location element of the OLI equation.

More recently, IB researchers have argued that traditional approaches to location behavior in the international business literature, such as the OLI framework, may no longer be appropriate for describing the behavior of MNEs (McCann & Mudambi, 2004). In the context of offshoring, Doh (2005) has argued that ownership and internalization are less relevant because these two advantages can erode through the transfer and disintegration of production stages to other countries, while location advantages are still relevant. Increasingly, however, these location advantages emphasize a broader portfolio of assets beyond lower input costs, availability of resources, or savings from tariff avoidance. Rather, the quality of infrastructure – including business infrastructure – as well as the abundance and quality of human capital appear to be increasingly important drivers of location decisions (Doh, 2005). More specifically, these advantages may include quality workers (educated workforce), infrastructure (such as electronic infrastructure supporting telecommunications), as well as cultural similarity. Since these location advantages remain critical determinants for services offshoring, it is logical that firms looking to offshore their services should base decisions on the range of location advantages individual countries have to offer.

Understanding the principal drivers of services offshoring, and the factors and dynamics of the business environment that facilitate its location, are important for both firms deciding where to locate facilities and countries seeking to improve their standing as a location for offshoring facilities. Despite the importance of an integrative view of locational advantages to the services offshoring decision, there is little empirical research on location decisions in the specific context of services offshoring. In addition, most empirical research in international business has descriptively investigated why firms have gone abroad and engaged in certain activities. This paper takes a different perspective. We argue that overall host country efficiency in services production is a key consideration in offshoring decisions (Chakravorty, 2003) and investigate which countries best satisfy this criterion to inform firm-level offshoring investment decision making as well as to identify distinct groupings in terms of overall and input-specific efficiencies.

2.2. Location selection in manufacturing versus services offshoring

In making location decisions for manufacturing, factors that have been identified as important include infrastructure, location-specific risk factors, and government policy (Mudambi, 1995). Yet, factors that have an impact on manufacturing are not necessarily important for services (Doh & Pearce, 2004; Graf & Mudambi, 2005). Table 1 contrasts factors that have been shown to be important for manufacturing location with those that are most critical for services. Within the infrastructure group, Mudambi (1995) investigated manufacturing as a percentage of GDP, labor costs, per capita energy consumption, population, and proximity to major markets. Among these variables, the most important factor for service outsourcing would appear to be labor cost because cost reduction is one of the main objectives for firms to outsource. Due to better telecommunications technology, proximity to major markets is less crucial for services outsourcing. Similarly, transportation infrastructure, such as roads, airports, railways and proximity to major markets, is important for manufacturing but not for offshoring services. Rather, the critical infrastructure variable for services offshoring is the level of telecommunications development. In addition, given that services offshoring relies heavily on human capital, the level of education is more important than the aggregate population or income. Indeed, services offshoring is directly dependent upon an abundance of knowledge workers (although at reasonable cost).

2.3. Specific rationale for services offshoring

Offshoring – whether services production is retained as an in-house function or outsourced to third-parties – involves a more complex calculus due to the natural complexities of coordinating work performed in a distant geographic location and integrating that work within the core activities of the firm (Doh, 2005). Hence, the basic rationale for offshoring can be separated into macro-level and micro-level factors.

At the macro level, the main driver for services offshoring is technology. Technology makes possible the separation of various activities of the organization across geographic space (Corbett, 2004). Information and telecommunications technology allow companies to perform information-based activities anywhere in the world and to instantaneously deliver the results to anywhere else in the world. As a result, services which typically have been produced near the point of

Table 1
Differences in location considerations for FDI in services offshoring and manufacturing

	Manufacturing	Services offshoring
Infrastructure		
Physical infrastructure	Road/airport/railway	Telecommunications technology
Human capital/labor	Low skill workers	High skill workers; educational level is key attraction
Location-specific factors		
Political risk	More vulnerable to political risk because manufacturing investment is capital intensive and immobile; hence ''obsolescing bargain''	Less vulnerable because of labor-intensity and investments provide net employment opportunities for local citizens
Business risk	Firms looking to serve local markets are concerned about factors such as income per capita	Firms do not serve domestic- market. As a result, domestic economic variables of less importance
Government policy		
Government incentives	More relevant to attract investments	Less relevant. For example, there is no need for free trade zones or other incentives
Cost	High set-up cost	Low set-up cost

consumption can be subdivided into their components and traded in the same manner as has been possible with manufacturing products, with the additional advantage that transportation costs for deploying legal, accounting, or IT services across geographic space are near zero (Doh, 2005; UNCTAD, 2004). Another macro-level driver is increasing competition in global markets and the trend for firms to focus only on their core advantages at headquarters and increasingly move their production to higher-efficiency locations.

At the micro-level, clearly one consideration for services offshoring is to take advantage of cost savings. For example, Farrell (2005) found that U.S. companies save $0.58 for every dollar spent on jobs they move to India. Likewise, German companies save €0.52 for every euro spent similarly. In a recent study, 93% of the respondents indicate that cost reductions were the number one reason why U.S. firms offshore (Duke CIBER/Archstone Consulting, 2005). The largest portion of these cost savings typically comes from the difference in wages between those in developed countries and those in the developing countries. For firms that use captive offshoring, these savings are not only from the availability of cheaper labor but also from the consolidation of activities in fewer locations and economies of scale (Doh, 2005; Farrell, 2005). Firms that use offshore outsourcing also may gain benefits from the suppliers' expertise and capacity for specialization.

In addition to reducing costs, firms also hope to improve productivity and quality, reduce the amount of time required to create new products, and respond to orders, inquiries, and complaints from customers (Yourdon, 2005). Competitive pressure, service quality, qualified personnel, improvement of focus, variable cost structure, access to skills, revenue growth, and innovation are also cited as drivers of services offshoring (Corbett, 2004; Duke CIBER/Archstone Consulting, 2005). Offshoring of service functions, such as internal clerical, maintenance, and support operations, would help improve productivity and competitiveness because these functions are traditionally performed by internal departments operating as *de facto* monopolies, thus, inefficiently (Drucker, 1989). Finally, some researchers have cited strategic considerations, such as the ability to focus on core competencies or industry innovativeness, as important factors in the decision to outsource (Kotabe & Murray, 2004; Zhu, Hsu, & Lillie, 2001). Lewin (2005) discusses how offshoring businesses are ''morphing'' up the value chain to capture greater high-value-added activities. All of these factors are relevant to whether services offshoring is attracted to a specific location such that host countries may reap the positive developmental impacts of that investment.

2.4. Assumption and hypotheses

Building on the discussion above contrasting location decisions in services versus manufacturing and the macro- and micro-level factors that have been identified as driving services offshoring, we propose that the overall efficiency in the production of services of the host country is the primary driver for offshoring of services. That is, firms considering offshore services investment will be attracted to countries that are more efficient providers of the inputs and outputs associated with service offshoring. Yet, all host countries are not equally efficient in terms of services offshoring. Building from our assumption and the literature on

FDI generally, and location decisions for services offshoring in particular, we expect there to be variation among the relative efficiency individual countries attain with respect to their location attractiveness.

Hypothesis 1. The greater the overall efficiency of a country location, the more attractive it will be for offshoring investment.

In considering location, firms may sometimes be tempted to enter other countries after focusing only on the cost of production while ignoring other factors such as productivity, country infrastructure, and quality of the service/outputs. Many firms however have found that offshoring of services can be more complicated than anticipated. Large friction-related costs may arise and require more management attention than expected (Nicholson & Sahay, 2001). Schemenner (1979) suggested that companies should consider not only the least costly site but also intangible and qualitative features of a location that could contribute to the company's competitive success. These qualitative factors include the educational and training strengths of the area and cultural attributes of the location. According to recent work (Duke CIBER/Archstone Consulting, 2005), service quality and cultural fit were identified as the most significant risks of offshoring, the latter risk being partly a function of location. Doh (2005) reports that Dell was forced to repatriate some of its call centre staff from India to Texas due to quality control problems and Lehman Brothers undertook a similar step (Drezner, 2004; Graf & Mudambi, 2005).[4] In sum, we expect a range of factors – above and beyond wage costs – to determine the relative efficiency of individual countries' attractiveness for hosting offshoring services.

Hypothesis 2. The greater the specific input efficiency of a country location, the more attractive it will be for offshoring investment dependent upon that input.

Hence, Hypothesis 2 prompts us to examine the sources of host country efficiency in more detail.

[4] In the case of Dell, "Despite this growth, BPO decisions have come under increasing scrutiny and criticism. For example, customer complaints pushed Dell to announce in November 2003 that it would stop routing some of its corporate customer calls to a contact center in Bangalore, India. Dell rerouted calls from U.S. purchasers of the OptiPlex desktop and Latitude notebook personal computer to existing U.S. facilities. Cultural differences, language difficulties and time delays in reaching senior technicians were cited (Frauenheim, 2003). However, Dell continued to handle calls from European and Asian purchasers of these products in India" (Graf and Mudambi, 2005, p. 254).

3. Data, methods, and analysis

In this section, we briefly discuss trends in the major source and destination countries active in offshoring, which we then incorporate into our DEA model. We describe the model specification and the principal variables we include in it. We then report and discuss results for both aggregate and input-specific analysis. In particular, we use cluster analysis to identify patterns in the efficiencies of the host countries with respect to services offshoring.

3.1. Source and destination countries active in offshoring

We used data obtained from the LOCOmonitor database as developed by OCO Consulting. The database contains project information for over 36,000 worldwide foreign direct investment projects. From this database, we extracted the FDI projects in customer support centers, shared service centers, IT and software, and regional headquarters FDI projects for the years 2002 (the first complete full year of data) to 2005 (the last full year of data). Due to the fact that during this period, the U.S. had the largest number of investment projects of any country worldwide, the current research utilizes the U.S. as the home country. In terms of services projects, there were 44 host countries with 976 projects associated with U.S. firms. A complete listing of the host countries appears in Table 2.

In this paper, our data do not allow for micro-level examinations of how firms make internal decisions as to whether or not they should engage in services offshoring (see instead Schniederjans & Zuckweiler, 2004). Instead, we examine the offshoring location decision after the firm has already decided to proceed with offshoring. We examine the relative efficiency of these countries vis-à-vis each other by using data envelopment analysis (DEA). DEA permits an examination of which countries use their resources or inputs most efficiently in order to produce the greatest amount of outputs from a set of inputs. From the perspective of a firm, an attractive location is one that has high levels of efficiency in turning inputs into outputs. A singular focus on low costs, for example, may lead a firm to select a location with low costs but even lower output levels. This would be unattractive to a firm as it would experience diminished capabilities and may have to consider repatriating the operation. Obviously, such a calculation has important ramifications for host countries seeking to attract and retain offshore

Table 2
DEA relative efficiencies

	(1) Model A	(2) Model B	(3) Wages	(4) Education	(5) Infrastructure	(6) CDI
Argentina	1.000	1.000	0.115	0.047	0.091	0.028
Australia	1.000	1.000	0.186	0.291	0.290	1.000
Austria	0.060	0.824	0.289	0.803	0.800	0.261
Belgium	0.185	0.790	0.285	0.747	0.787	0.285
Brazil	0.049	0.350	0.240	0.063	0.117	0.063
Canada	1.000	0.955	0.283	0.519	0.451	0.251
Chile	0.236	0.333	0.091	0.081	0.158	0.032
China	0.490	1.000	1.000	0.335	0.418	0.335
Colombia	0.172	0.127	0.044	0.021	0.041	0.012
Czech Republic	1.000	1.000	0.152	0.150	0.185	0.052
Denmark	0.238	0.667	0.196	0.667	0.617	0.196
Finland	0.030	0.178	0.063	0.177	0.173	0.060
France	0.312	0.809	0.673	0.804	0.673	0.592
Germany	0.189	0.804	0.764	0.803	0.762	0.762
Greece	0.025	0.867	0.274	0.557	0.629	0.178
Hong Kong	1.000	1.000	0.601	0.999	0.930	0.298
Hungary	1.000	1.000	0.155	0.165	0.327	0.059
India	1.000	1.000	1.000	0.179	0.349	0.179
Indonesia	0.020	1.000	0.537	0.116	0.327	0.116
Ireland	1.000	1.000	0.354	1.000	1.000	0.354
Israel	0.060	0.533	0.207	0.285	0.305	0.110
Italy	0.045	0.793	0.583	0.705	0.722	0.446
Japan	0.145	0.585	0.553	0.580	0.538	0.538
Malaysia	0.651	0.815	0.263	0.195	0.318	0.090
Mexico	0.133	0.576	0.317	0.075	0.202	0.075
Netherlands	0.430	1.000	0.477	1.000	0.988	0.477
New Zealand	1.000	1.000	0.063	0.139	0.143	0.042
Norway	0.014	0.476	0.137	0.476	0.434	0.137
Pakistan	1.000	1.000	1.000	0.012	0.040	0.009
Philippines	1.000	1.000	0.135	0.029	0.112	0.022
Poland	0.248	0.539	0.203	0.125	0.240	0.073
Portugal	0.039	0.526	0.161	0.244	0.322	0.079
Romania	1.000	1.000	0.077	0.043	0.338	0.019
Russia	0.061	0.521	0.311	0.109	0.285	0.109
Slovak Republic	1.000	1.000	0.052	0.056	1.000	0.018
South Africa	1.000	1.000	0.097	0.076	0.091	0.047
South Korea	0.218	0.622	0.382	0.384	0.597	0.217
Spain	0.327	1.000	0.703	0.893	1.000	0.461
Sweden	0.144	0.615	0.259	0.615	0.603	0.259
Switzerland	0.414	0.747	0.223	0.731	0.581	0.223
Thailand	0.102	1.000	0.495	0.147	0.481	0.102
Turkey	0.016	0.401	0.260	0.177	0.330	0.129
U.K.	1.000	1.000	1.000	1.000	1.000	1.000
Venezuela	1.000	1.000	0.020	0.013	0.040	0.005

investment and capitalize on the resulting jobs and economic spillovers.

3.2. Model specification

DEA permits us to assess the relative efficiencies of the different entities under consideration. Simple efficiency can be conceptualized as the ratio of output over input, but when there is more than one input or output, DEA obtains an efficiency ratio in this more complex case by using linear programming (Charnes, Cooper, & Rhodes, 1978). The key benefit of DEA is that it provides a single overall measure of relative efficiency in the case where there are either multiple outputs, multiple inputs, or both. The maximum efficiency is 100% (relative to other countries) and the minimum efficiency is 0%. We use the variable returns to scale approach to DEA as articulated by Banker, Charnes, and Cooper (1984). The variable returns to scale approach is typically preferred to a

constant returns to scale approach as the latter imposes assumptions on the analyses which may not be satisfied in practice. DEA has been widely used in empirical examinations of firm activities because the method indicates the best-practices among the set of the units of analysis as well as providing specific targets as to what must be done in order for a non-best-practice unit to obtain the best-practices level. One DEA bibliography of work between 1978 and 1992 contains over 470 published articles involving the method (Seiford, 1994).

3.3. Input measures

We utilize the following categories of inputs for the DEAs to be conducted on the countries under consideration. In addition to these core variables, we did experiment with alternate specifications that included a political risk variable. There was no appreciable change in results and thus, the variable was not included. We do not include geographical distance in our inputs because we focus on services offshoring. As explained previously, telecommunications technology allows the outsourced services to be instantly transmitted around the world, so geographical distance is a lower-relevance criterion.

3.3.1. Wages

Since one of the main reasons identified for offshoring of services is cost reductions that can be derived mainly from lower wages in the host countries, we include wage as one of the inputs. We utilize 2003 wage data published by the Union Bank of Switzerland (UBS, 2003). UBS conducts a major survey every three years. Since the broader data set that we use involves the 2002–2005 timeframe, the 2003 survey would fall in to this period and therefore be the most appropriate. These data are based on a wage survey in 71 cities on all major continents. Wage calculations are based on wage information from a basket of 13 widespread professions. The index is weighted proportionally by the number of employed per profession as well as by gender. Gross wage data were used as this represents the cost to the employer. Net wage data, wages after taxes and social security contributions, are less relevant from the perspective of a firm. National wage information is collected from a limited number of major cities per country. Typically only one city is used per country in the UBS survey.

We regard wage information in a major city as an asset of this data set as it more reasonably reflects the costs that service firms would likely incur in the country. By contrast, average nationwide national wages are likely to be biased quite considerably lower because of the impact of decreased wages in rural, underdeveloped and agricultural areas. Since the infrastructure and labor pools in these kinds of areas are comparatively unattractive to service-oriented firms, wages in these areas are of low relevance to firms and hence to the current research.

3.3.2. Education

Offshoring services could range from low-value-added activities to more sophisticated activities such as R&D, architectural design, financial analysis and software programming. In addition, education has been shown to be a determinant of the location and type of FDI and the competitiveness of a given economy (Porter, 1990). Doh, Jones, Teegen, and Mudambi (2005) found that level of education was a significant determinant in the location of U.S. research and development investment abroad. Education is especially important to higher value-added offshoring activities such as software programming, financial analysis, and legal research. Because we are interested in examining marginal efficiency, that is, the amount of output from a unit of input, in the case of education, the aggregate resource is the educated workforce and the unit of input is the educated individual. Unfortunately, due to data unavailability, this information does not exist for all education levels in all of the countries under consideration. Therefore, as the best available proxy we utilize the total number of pupils enrolled at the secondary level in public and private schools in 2001, except for China for which only 2000 data were available (World Bank, 2005). The number of pupils enrolled in secondary education provides an indication of the number of people joining the workforce with a more advanced education. A country with a greater proportion of students enrolled in secondary education will be one that has a more educated workforce.

3.3.3. Infrastructure

Research has suggested that the existence and quality of infrastructure services has high relevance to the attractiveness of the host countries (Rao, 2004; UNCTAD, 2005). Importantly, a number of services, such as call centers or medical diagnostics, cannot be performed without reliable advanced telecommunication linkages and appropriate technology available in host countries. Countries with lower wages typically have less developed infrastructures. These host country governments must spend capital on infrastructure in order to provide a more attractive environment for firms looking to offshore. In our study, we examine the effect

of these expenditures on country-level outputs. Our data comes from the World Development Indicators database (World Bank, 2005) and consists of the 2002 information and communication technology expenditures of the countries under consideration in current U.S. dollars.[5]

3.3.4. Cultural differences

Hofstede (1980) has examined how management practices are influenced by cultural differences. In addition, the research by Duke CIBER/Archstone Consulting (2005) also indicated that cultural fit is one of the concerns firms have for offshoring. Managerial training or translation could create additional expenses. For example, in their longitudinal case study Nicholson and Sahay (2001) describe a British firm's decision to outsource software development activities to India. Cost savings and an interest in accessing a larger pool of qualified employees are clearly identified as drivers of this management initiative. However, the cultural issues that arise and require managing constitute an implicit cost, which must be absorbed by the firm. The importance of these issues is highlighted by Gupta and Raval (1999) who state that they can "make or break an offshore project". As a result, cost reductions that firms anticipate obtaining might not be materialized because of the hidden costs of offshore outsourcing (e.g., Hendry, 1995). To measure the difference between two country's cultures, we use Hofstede's (2001) country scores on four cultural dimensions: power distance, individualism, masculinity and uncertainty avoidance. We use the mean absolute deviation of the Hofstede scores of the host country and the home country to create a cultural differences index (CDI). Specifically, we calculate the measure as

$$\mathrm{CDI} = \frac{1}{K}\sum_{k=1}^{K}\left|H_k^{\mathrm{Host}} - H_k^{\mathrm{Home}}\right|$$

where H is the Hofstede score and k indexes the $K = 4$ cultural dimensions (Bunyaratavej, Hahn, & Doh, 2007). Decreasing CDI scores indicate increasing cultural similarity, with a CDI of zero indicating equivalent cultures as measured by the Hofstede score (see Appendix A for more discussion of this measure).

[5] We appreciate the suggestion of one reviewer to use an alternative time-frame for this variable that would capture a broader time-period for infrastructure investment. Relative to physical infrastructure (roads/bridges), telecom and IT infrastructure is more perishable and relatively short-lived, and therefore we believe a contemporary time-period is the most appropriate in this context.

3.4. Output measures

We use the following outputs for the data envelopment analyses.

3.4.1. Number of projects

This output is the combined number of projects in customer support centers, shared service centers, IT and software, and regional headquarters sectors. This key factor is important for firm location decisions because firms could learn from existing firms' experiences in the host country. More importantly, the ability of a country to attract firms is *prima facie* evidence of an attractive business environment for firms. In addition, it is an indicator of how much firms are willing to have direct investments in these countries, compared to the export nature of the other two outputs, which will be mentioned as follows.

3.4.2. Commercial service exports

The ability of a country to produce value through its involvement in services will be a key consideration of businesses looking to offshore service components of their business. As such, we use the 2002 commercial service exports in current U.S. dollars of the countries under consideration. This data was drawn from World Development Indicators (World Bank, 2005).

3.4.3. Computer, communications and other services exports

These activities revolve around data- and information-based services such as transnational telecommunications, postal/courier services, computer data, and cross-border news-related service transactions. These types of activities are easily facilitated by ever-increasing developments in information technology, and so these kinds of services should be increasingly outsourced from home countries (i.e., high-cost countries) to host countries. We employ data on the 2002 value of these services in current U.S. dollars (World Bank, 2005).

4. Results and discussion

The initial DEA results are shown in Table 2. We first conducted an overall DEA using all of the inputs simultaneously and using the number of projects as the output (Model A—column 1 of Table 2). Then, we conducted another overall DEA using all of the inputs and the two export-related outputs (namely commercial service exports, and computer, communications and other services exports) simultaneously (Model B—column 2 of Table 2). These overall DEA analyses

address Hypothesis 1 and are useful to determine whether the countries under consideration have any source(s) of relative efficiency for services offshoring given the current measures used, as we subsequently explore using cluster analysis. In particular, we will compare how efficient certain types of countries are in terms of FDI projects and export of services. Second, we conduct four input-specific DEAs to explore in detail the exact sources of relative efficiency and address Hypothesis 2 again using cluster analysis. Finally, using the results from the four input-specific DEAs, we calculate the output targets that would be necessary to transform a country into an efficient producer. This allows us to draw conclusions about the ability of a country to become an efficient producer with respect to a particular input, and hence has important country-specific strategic ramifications.

4.1. Aggregate DEA analyses

Model A uses all inputs and the number of projects as an output. Model B utilizes all of the inputs and the two export-related outputs. These are useful for determining the extent to which countries have any source(s) of relative efficiency for direct investment and for service exports. Here, relative efficiencies of 100% indicate that, by utilizing some combination of the inputs and producing some combination of the outputs, a country would be as productive as or more so than its major services offshoring competitors under consideration here. For Model A with the U.S. as the home country in Table 2, Argentina, Australia, Canada, the Czech Republic, Hong Kong, Hungary, India, Ireland, New Zealand, Pakistan, the Philippines, Romania, Slovakia, South Africa, U.K. and Venezuela attain this threshold. For Model B, we find additional countries are efficient. These countries are China, Indonesia, Netherlands, Spain and Thailand. This implies that these countries are the most efficient in services export.

4.2. Input-specific DEA analyses

In the input-specific analyses (columns 3–6 of Table 2), we conducted DEAs utilizing one specific input along with commercial service exports, and computer, communications and other services exports as the outputs considered in the study. The single input was wage, education, infrastructure and CDI in columns 3 through 6, respectively. We can see that there is a high degree of country-specific heterogeneity in the countries' sources of relative efficiency, supporting Hypothesis 2. With regard to wages, China, India, Pakistan and the U.K. are the most efficient by a wide margin, the latter's high wages being offset by its extreme productivity in services. For a firm with paramount cost considerations, these are the most attractive countries in the consideration set. Turning to education, Ireland, the Netherlands and the U.K. are the most efficient. This indicates that the per-educated worker output of Ireland, the Netherlands, and the U.K. are the highest given the services output portfolio used here. Hong Kong was close behind with 99.9% relative efficiencies. With regard to infrastructure, Ireland, the Slovak Republic, Spain and the U.K. obtained 100% relative efficiencies. In terms of CDI, only Australia and the U.K. could obtain the 100% relative efficiency level.

The results of Table 2 provide rich detail regarding the relative efficiencies of countries with regards to services offshoring. However, to obtain better insight into the patterns indicated by Table 2, we perform cluster analyses on these efficiencies. These findings are described next.

4.3. Cluster analyses

We utilized a *k*-means clustering algorithm to identify the latent structure in Table 2. In our first cluster analysis, we examined the latent structure associated with the two kinds of overall efficiencies in Table 2, the overall project-oriented efficiencies and overall export-oriented efficiencies of Models A and B. In our second cluster analysis, we examined the latent structure of the input-specific efficiencies in columns 3 through 6. For our stopping rule, clusters leading to significant mean differences were added until the analyses produced a cluster size of 1. For comparability across analyses, we utilized the largest number of clusters supportable in both sets of analyses. Here, this was the four-cluster solution reported in Table 3.

The results of the first cluster analysis appear in Table 3. Corroborating Hypothesis 1, the cluster means were significantly different with respect to project-related efficiency ($F(3,\ 40) = 429.618,\ p < 0.0001$) and export-related efficiency ($F(3,\ 40) = 60.963$, $p < 0.0001$). We identified four clusters. The first cluster is composed of countries that are highly efficient at the overall level. Table 3 reveals that the efficiencies of countries in the first cluster are 100% efficient (or close to it) with respect to the resources possessed by the country on both projects and exports. This includes a blend of developed countries such as Ireland and the U.K., which continue to attract large quantities of FDI

Table 3
Cluster memberships with respect to overall efficiencies

Country	Project efficiency	Export efficiency	Cluster
Argentina	1.000	1.000	1
Australia	1.000	1.000	1
Canada	1.000	0.955	1
Czech Republic	1.000	1.000	1
Hong Kong	1.000	1.000	1
Hungary	1.000	1.000	1
India	1.000	1.000	1
Ireland	1.000	1.000	1
New Zealand	1.000	1.000	1
Pakistan	1.000	1.000	1
Philippines	1.000	1.000	1
Romania	1.000	1.000	1
Slovakia	1.000	1.000	1
South Africa	1.000	1.000	1
UK	1.000	1.000	1
Venezuela	1.000	1.000	1
Brazil	0.049	0.350	2
Chile	0.236	0.333	2
Colombia	0.172	0.127	2
Finland	0.030	0.178	2
Israel	0.060	0.533	2
Mexico	0.133	0.576	2
Norway	0.014	0.476	2
Poland	0.248	0.539	2
Portugal	0.039	0.526	2
Russia	0.061	0.521	2
Turkey	0.016	0.401	2
Austria	0.060	0.824	3
Belgium	0.185	0.790	3
Denmark	0.238	0.667	3
France	0.312	0.809	3
Germany	0.189	0.804	3
Greece	0.025	0.867	3
Indonesia	0.020	1.000	3
Italy	0.045	0.793	3
Japan	0.145	0.585	3
South Korea	0.218	0.622	3
Sweden	0.144	0.615	3
Thailand	0.102	1.000	3
China	0.490	1.000	4
Malaysia	0.651	0.815	4
Netherlands	0.430	1.000	4
Spain	0.327	1.000	4
Switzerland	0.414	0.747	4

while exporting substantial dollar volumes of services, to developing countries such as India and Pakistan which likely derive their efficiencies from substantial lowered wage costs (countries' actual sources of efficiency are examined momentarily).

The second cluster is composed of countries that are generally less efficient, particularly with respect to actual project investment. This cluster includes countries such as Brazil and Finland, which have attracted relatively few services FDI projects but nonetheless do have at least a moderate amount of efficiency in services exports. In the future, it may be of interest for these countries to leverage their moderate strength on exports so as to attract greater FDI project investment. The third cluster contains countries that are more competitive with regards to export productivity than are the countries in the second cluster. For the most part, this cluster consists of developed economies. Notable exceptions in this cluster include Indonesia and Thailand, which have 100% efficiencies on services export volumes but remain less able to attract FDI project investment. Finally, the fourth cluster has countries that tend to be highly efficient in exports and moderately efficient in projects. This includes China and Malaysia as well as the Netherlands, Spain and Switzerland. Countries in the fourth cluster face the same challenge as those in the second and the third clusters (although to a lesser extent), namely finding successful mechanisms for attracting increased FDI project investment.

We next examine the sources of countries' efficiencies with input-specific cluster analyses (see Table 4). Corroborating Hypothesis 2, the cluster means differed significantly with respect to wages ($F(3, 40) = 23.169$, $p < 0.0001$), education ($F(3, 40) = 61.809$, $p < 0.0001$), infrastructure ($F(3, 40) = 21.412$, $p < 0.0001$), and cultural differences ($F(3, 40) = 25.824$, $p < 0.0001$). The four clusters are as follows. The first cluster is composed of countries who derive their very high efficiencies from low wages. These countries are China, India and Pakistan. Members of the second cluster derive their moderately high-to-high efficiencies from education and infrastructure. This cluster is composed of developed countries including many of the larger European countries as well as Canada, Hong Kong, Japan, and South Korea. The third cluster consists of Australia, which derives its efficiency primarily from its cultural similarity to the U.S. In summary, Table 4 identifies the strong performers in Columns 3–6 of Table 2. Among these, the most attractive countries for outsourcing are China, India, Ireland, the Netherlands, Pakistan, Slovakia, Spain, and the U.K. All of these countries have at least one core competency among the inputs of wage, education, and infrastructure with which they obtain 100% efficiency. If the set of core competencies is expanded to include cultural distance, Australia also joins the list.

The last cluster consists of countries that appear to be less competitive based on an input-by-input examination of their characteristics. Some of the countries in this cluster are ones such as Brazil, which have relatively low overall efficiencies. Others, such as the Czech

Table 4
Cluster memberships with respect to input-specific efficiencies

Country	Wages	Education	Infrastructure	CDI	Cluster
China	1.000	0.335	0.418	0.335	1
India	1.000	0.179	0.349	0.179	1
Pakistan	1.000	0.012	0.040	0.009	1
Austria	0.289	0.803	0.800	0.261	2
Belgium	0.285	0.747	0.787	0.285	2
Canada	0.283	0.519	0.451	0.251	2
Denmark	0.196	0.667	0.617	0.196	2
France	0.673	0.804	0.673	0.592	2
Germany	0.764	0.803	0.762	0.762	2
Greece	0.274	0.557	0.629	0.178	2
Hong Kong	0.601	0.999	0.930	0.298	2
Ireland	0.354	1.000	1.000	0.354	2
Italy	0.583	0.705	0.722	0.446	2
Japan	0.553	0.580	0.538	0.538	2
Netherlands	0.477	1.000	0.988	0.477	2
South Korea	0.382	0.384	0.597	0.217	2
Spain	0.703	0.893	1.000	0.461	2
Sweden	0.259	0.615	0.603	0.259	2
Switzerland	0.223	0.731	0.581	0.223	2
UK	1.000	1.000	1.000	1.000	2
Australia	0.186	0.291	0.290	1.000	3
Argentina	0.115	0.047	0.091	0.028	4
Brazil	0.240	0.063	0.117	0.063	4
Chile	0.091	0.081	0.158	0.032	4
Colombia	0.044	0.021	0.041	0.012	4
Czech Republic	0.152	0.150	0.185	0.052	4
Finland	0.063	0.177	0.173	0.060	4
Hungary	0.155	0.165	0.327	0.059	4
Indonesia	0.537	0.116	0.327	0.116	4
Israel	0.207	0.285	0.305	0.110	4
Malaysia	0.263	0.195	0.318	0.090	4
Mexico	0.317	0.075	0.202	0.075	4
New Zealand	0.063	0.139	0.143	0.042	4
Norway	0.137	0.476	0.434	0.137	4
Philippines	0.135	0.029	0.112	0.022	4
Poland	0.203	0.125	0.240	0.073	4
Portugal	0.161	0.244	0.322	0.079	4
Romania	0.077	0.043	0.338	0.019	4
Russia	0.311	0.109	0.285	0.109	4
Slovakia	0.052	0.056	1.000	0.018	4
South Africa	0.097	0.076	0.091	0.047	4
Thailand	0.495	0.147	0.481	0.102	4
Turkey	.260	.177	.330	0.129	4
Venezuela	0.020	0.013	0.040	0.005	4

Republic, have moderate to high overall efficiencies but their source is not apparent in the input-specific analyses (Slovakia being the lone exception). For these countries, the source of their efficiencies in the overall analyses may be a function of their smaller size. Recall that the DEA estimated efficiencies under a variable returns to scale approach. This approach estimates the efficiencies via a non-linear hull with respect to the countries' data. As a result, smaller economies may produce less-than-proportionally than do larger economies simply because they have not obtained sufficient economies of scale (i.e., there are increasing returns to scale). However, if Small Economy A is producing more than other small economies (i.e., its data lie on the non-linear hull), it is accordingly the most efficient small economy. Similarly, very large economies may produce less-than-proportionally than do moderate economies because of decreasing returns to scale. Thus, the variable returns to scale DEA accounts for size effects and input/output ratios.

Table 5
Output targets for efficient producers

	Commercial services exports			Comp./Comm. services exports		
	Wage	Education	Infrastructure	Wage	Education	Infrastructure
Argentina	8.73	21.28	10.99	14.13	39.24	20.74
Australia	5.38	3.44	3.45	12.51	9.55	5.07
Austria	3.46	1.24	1.25	3.70	1.67	1.38
Belgium	3.66	1.34	1.27	3.50	1.58	1.27
Brazil	4.18	15.93	8.55	4.18	15.86	8.55
Canada	3.54	1.93	2.22	3.65	2.32	2.22
Chile	10.98	12.35	6.32	20.18	32.86	17.11
China	1.00	2.98	2.39	1.00	3.60	2.64
Colombia	22.58	48.61	24.57	50.55	130.92	72.17
Czech Republic	6.57	6.66	5.40	10.98	16.56	13.63
Denmark	5.10	1.50	1.62	6.31	2.33	2.13
Finland	17.94	5.65	5.77	15.83	6.22	5.77
France	1.48	1.24	1.49	1.85	1.65	1.78
Germany	1.36	1.29	1.37	1.31	1.24	1.31
Greece	3.65	1.79	1.59	15.70	10.08	8.95
Hong Kong	1.66	1.00	1.07	1.66	1.34	1.21
Hungary	6.45	6.06	3.06	6.45	7.34	3.70
India	1.00	8.01	3.67	1.00	5.58	2.86
Indonesia	1.86	10.67	3.06	1.86	8.61	3.06
Ireland	3.55	1.00	1.00	2.82	1.00	1.00
Israel	6.17	3.81	3.55	4.84	3.51	3.28
Italy	1.71	1.42	1.38	2.09	1.92	1.38
Japan	1.89	1.78	1.95	1.81	1.72	1.86
Malaysia	3.81	5.13	3.15	5.05	9.54	6.26
Mexico	3.16	13.28	4.94	20.88	89.96	28.03
Netherlands	2.58	1.00	1.09	2.10	1.00	1.01
New Zealand	15.88	7.19	7.01	45.69	27.09	25.27
Norway	7.30	2.10	2.30	12.16	4.40	4.12
Pakistan	1.00	84.54	24.90	1.00	129.25	45.68
Philippines	7.43	33.96	8.96	18.64	74.30	23.18
Poland	4.94	8.02	4.17	8.17	17.36	9.31
Portugal	6.21	4.11	3.11	10.68	9.66	7.35
Romania	12.94	23.24	2.96	14.29	31.81	3.74
Russia	3.21	9.17	3.51	3.79	12.90	3.96
Slovakia	19.19	17.87	1.00	26.29	36.74	1.00
South Africa	10.31	13.20	10.94	56.59	86.59	44.25
South Korea	2.62	2.61	1.68	4.21	5.00	2.52
Spain	1.42	1.12	1.00	2.32	2.18	1.00
Sweden	4.83	1.64	1.76	3.86	1.63	1.66
Switzerland	4.49	1.37	1.72	6.48	2.47	1.98
Thailand	2.02	6.82	2.08	4.23	14.42	5.14
Turkey	3.85	5.65	3.03	9.44	16.06	6.35
UK	1.00	1.00	1.00	1.00	1.00	1.00
Venezuela	49.76	77.70	25.27	121.14	248.06	81.65

4.4. Country-specific targets for services exports

To be fully competitive, the units of analysis will seek to be ''efficient producers'', i.e., they will seek to obtain 100% relative efficiency in at least one area of specialization. Table 5 contains information about the contains the ratio of the target output to the current output which shows the amount of outputs that each country would need to increase in order to be an efficient producer in terms of wages, education and infrastructure (we do not include cultural factors here as these are long-term societal phenomena that are resistant to change). We can use these results to guide countries as to what must be done to become more efficient and attract more higher-valued services. In addition, we can also see what countries might soon become efficient countries and compete with the existing efficient ones. The second to the fourth columns of Table 5 contains the ratio of the

target output to the current output for commercial services exports with regard to wages, education and infrastructure, respectively. For example, we see that the target-to-current ratio for Ireland in terms of wages is 3.55. This indicates that Ireland would need to raise commercial service exports by a multiplicative factor of 3.55 in order to become 100% efficient compared to China and India. Alternatively, Ireland could also become 100% efficient by keeping wages constant and producing services that have a market value 3.55 times the market value of its current services.[6] On the other hand, Ireland is already efficient in terms of education and infrastructure. In the last three columns of Table 5 contains the country's target output level for the second output, exports of computer and communication services with regard to wages, education and infrastructure. We see Ireland could also become 100% efficient in terms of wages by raising exports of computer and communication services to 2.82 times its current level. With regard to education and infrastructure, again, Ireland is currently at the 100% efficiency level.

We can see that developing countries such as Indonesia, the Philippines, and Poland are more likely to be able to improve their efficiency in terms of wages and infrastructure rather than education due to the relative low target to output ratios in wages. As for general regional trends, South American countries appear to require considerable efforts to reach the export targets that would enable them to become efficient. Brazil, Chile, Colombia, and Venezuela would need to increase services export trade volumes relatively dramatically in order to become efficient (Venezuela's efficiency may be due in part to a scale effect as discussed previously). Many of the developed economies remain rather competitive due to their educated workforces, and hence outputs per educated worker would not have to rise too dramatically before obtaining efficiency. This may partially explain the repatriation of some outsourced activities such as those by Dell and Lehman Brothers described above.

5. Conclusions, limitations, and implications

We extend existing theory regarding location for FDI to show that country-level variables important to offshoring of services are different than those that have been found critical for manufacturing, and that difference combinations of inputs yield different ''mixes'' of attractiveness for offshoring. Moreover, our paper provides what may be the first application of DEA to country-level services offshoring location decisions. We believe one of our contributions is a methodological one: the utility of the DEA methodology to the important phenomenon of FDI generally and offshore location, specifically.

Our overall findings provide support for the hypothesis that countries do differ in their relative efficiency levels for services offshoring. Moreover, countries have different sources of relative efficiencies. As a result, the research suggests that the location decision is an important one for firms and these companies can make better decisions by capitalizing on a better understanding of the countries' relative strengths and weaknesses. Kotabe and Murray (2004, p. 615) note that ''very few empirical studies. . .. have been conducted in examining service firms' competitive strategies in the global arena.'' Our study should add to this relatively circumscribed research base.

5.1. Limitations

Our analyses feature a number of limitations and delimitations. First, as a meta-examination of location decision-making, we selected input variables that, based on our review of the literature and our theoretical development, we believed were among the most important in terms of offshoring location decisions. Nonetheless, it is possible other variables might also be important in contributing to offshoring location efficiencies, especially with regard to a specific location decision. At the country level, these may include host country economic and political risk (some of which may be accounted for as discounts in our efficiency measures), the industry-specific factors that may influence firms in one industry to consider a given destination even though it may not score high on aggregate or input-specific efficiency measures, and the resources and capabilities of the investing firms and the potential match of those resources with features of the host country. In addition, ours is a cross-sectional rather than a longitudinal analysis. As such, it does not capture changes or trends in host country efficiency, which may be relevant to investors. Our method of measuring CDI assumed that all four cultural variables are treated equally. Some variables could have greater influences on the success of MNEs than others (Shenkar, 2001). Tihanyi, Griffith, and Russell (2005) called for better measurements for cultural differences that are relevant

[6] Note that from a realistic public policy perspective, such actions may be unattainable. However, the figures given here can be used to understand the magnitude of the efforts that would be required to obtain efficiency.

to organizational decisions. They found that cultural distance may not always be directly related to entry mode choice, international diversification and MNE performance. We also note that, as pointed out by an anonymous reviewer, there may be limitations associated with the use of DEA at the country-level when, as in the current study, there are countries that are both developed and developing as well as countries with different location advantages. Nonetheless, the variable returns to scale formulation of DEA (utilized here) is designed to address the differences in scale effects that would be associated with size heterogeneity (e.g., developed and developing countries).

5.2. Implications for research and practice

This paper has implications for the following audiences. First, the results in Table 5 provide actionable targets for governmental policy makers seeking to capitalize on the growth of offshore investment to foster economic and social development. Policy makers should carefully consider those factors that can be influenced via government action. We demonstrate that some countries have clearly and unambiguously excelled at creating a climate conducive to offshore investment *relative* to other countries. By having concrete benchmarks and examples of best-practices, as well as data on where their country is not operating at the best-practice level, government officials have relevant information upon which to act through strategic investment and legislative priorities. Second, the findings presented here will be useful for MNEs looking to offshore as we present the strengths and weakness of the various countries in a common scaled format using a common methodology. Doh and Pearce (2004, p. 74) argue that additional research that explores ''practical implications of for government and business are critically important.'' Hence, our research contributes to this call for practical approaches to questions surrounding location decisions for services offshoring.

This research also responds to the paucity of theoretical frameworks and empirical studies on the causes and consequences of offshoring in services (e.g., Graf & Mudambi, 2005; Kotabe & Murray, 2004). First, we have developed a theoretical model that identifies the factors most important for services offshoring and contrast those with the traditional locational determinants in manufacturing. This is an important first step in any empirical assessment of the principal locational determinants important to services offshoring business. Second, our research empirically corroborates country-specific differences in offshoring efficiency and identifies the sources of efficiency at the country level and in so doing, adds to the empirical base upon which future studies could build. Researchers will benefit from the research regarding the strengths and weaknesses of these countries, especially in the areas of education and infrastructure. Lewin (2005) stresses the importance of human capital in offshoring activities, and our observations regarding the countries that are most efficient in the provision of education are examples of the importance of this factor. Third, our research offers directions for future empirical research. Apart from contributing to the literature on the differing offshoring-related characteristics of these major offshoring destinations, future research could build on the present research by following the longitudinal changes in services offshoring efficiency in these nations. Comparative empirical research juxtaposing services offshoring and manufacturing offshoring would also be illuminating, especially once the empirical literature on services offshoring begins to grow. In addition, as Doh and Pearce (2004) note, theories of internationalization (e.g., Johanson & Vahlne, 1990; Vernon, 1966) and FDI (e.g., Dunning, 1988) have not adequately incorporated the unique and potentially idiosyncratic nature of services. Offshoring also challenges the basic diamond framework offered by Porter, 1990), and even suggests an extension of the ''double-diamond'' critique of that framework (see Rugman, van den Broeck, & Verbeke, 1995). Offshoring suggests a complete de-coupling of factors across geographic space. This study provides as basis for further development of both theoretical and empirical contributions that extend and re-specify core IB theories in light of services internationalization.

Finally, our study may provide contributions to broader questions regarding the social and economic dynamics of offshoring. Doh (2005, p. 73) notes, ''. . .offshoring represents a natural continuation of a process that has been underway for centuries. Paradoxically, the apparent acceleration of offshoring reflects both the successes and failures of economic globalization. Labor – not just capital – has now become a mobile factor that can be deployed – and redeployed – at a moment's notice.''. Lewin (2005, p. 491) argues that ''the sheer number of organizational capabilities that could be offshoring candidates is large''. . . and ''offshoring is still in a trial and error learning by doing phase of evolution.'' Our research responds to the challenge of measuring, evaluating, and assessing the factors that contribute to offshoring and sets the stage for further analysis of the social and economic

consequences and implications of this growing phenomenon.

Appendix A

The current study utilizes a measure of cultural distance. There are two commonly used mathematical conceptualizations for measuring distance. The first is ''Manhattan'' or ''city-block'' distance. This measure of distance applies when the distance occurs along orthogonal dimensions such as the North–South and East–West axes on a city grid. Given that Hofstede provides four largely orthogonal constructs, city-block distance is an appropriate distance measure. The second is Euclidean distance. This distance measures the spanning of multiple dimensions simultaneously by the shortest possible straight line. Kogut and Singh (1988) developed a measure of cultural distance using Hofstede's constructs that has gained widespread use, however, alternative operationalizations of their measure have also been used (e.g., Agarwal, 1994) including one attributable to Singh (Morosini, Shane, & Singh, 1998). Here, we note that Kogut and Singh's distance measure is neither city-block nor Euclidean. Further, it is a derived from variably scaled functions of the original constructs. Thus, the distance implied by the quantities computed is somewhat less immediate and potentially less precise than the city-block distance approach used here.

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