For Soc Econ (2010) 39:127–143
DOI 10.1007/s12143-008-9021-x

The Interaction of Foreign Direct Investment with Electronic Commerce in Less Developed Countries

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Published online: 11 June 2008

Abstract This paper argues that the international growth of e-commerce (whether business–business, business–consumer or consumer–business) can increase a critical technology infrastructure gap that disadvantages less-developed countries (LDCs) in their future e-commerce participation. This gap is linked to the type as well as the volume of foreign direct investment (FDI) which economies at different levels of development attract. The macro technical, legal and socio-economic problems that entwine FDI inflow and e-commerce growth in LDCs, reducing e-commerce attractiveness and also making FDI less attractive, are classified. Governments must recognise this interdependence, pin-point the types of macro constraints operating in their particular economy that curb FDI in e-commerce attracting investment and prioritise the desirability and incentives offered to the various types of FDI infrastructure.

Keywords E-commerce · Foreign direct investment · Infrastructure · Information communication technologies · Development · Less-developed-countries

Introduction

There is general agreement that information and communication technology (ICT) has fundamentally reshaped the way businesses and consumers can communicate,

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interact and transact globally, generating a rapid growth of online transactions or electronic commerce (e-commerce). For developed economies, investment in ICT, including the Internet, has a positive effect on foreign direct investment (FDI), but for LDCs, FDI appears to precede an increase in ICT investment (Gholami et al. 2005; Addison and Heshmati 2004; Gani and Sharma 2003). Developed countries have distinctly higher e-commerce participation rates (a proxy for measuring benefits) than most other countries (Fife and Pereira 2002). Because of the connection between ICT and e-commerce, the causal relationship from FDI to ICT in LDCs has consequences for e-commerce participation and effectiveness, restricting the attractiveness of ICT forms of FDI (Kotabe and Helsen 2004) in such economies.

This paper contends that to avoid a potentially growing disparity in e-commerce participation, LDCs need to address a specific range of technical, legal and socio-economic constraints hindering their e-commerce participation on an equal footing with ICT infrastructural issues and their links to FDI. Addressing the growth of e-commerce for an LDC is tied to macro environmental constraints that shape the level and type of FDI in that country. Failure to address these constraints can act as a barrier for inflows of FDI and hence for e-commerce participation. ICT infrastructure can be seen as a necessary but not sufficient condition for e-commerce takeoff. While FDI in ICT can benefit economic growth and may be sought by governments, attracting FDI in e-commerce requires addressing issues in addition to those in the FDI and ICT linkage.

Following elaboration of relevant theories of FDI and its links to ICT infrastructure, macro environmental constraints on e-commerce and e-commerce related FDI are identified and discussed, accounting for technical, legal and regulatory, and socio-economic issues (Aisbett and Pires 2003; Bingi et al. 2000). Interaction between FDI and e-commerce is then discussed leading to the conclusion that LDCs that fail to tackle the constraints hindering their e-commerce growth also restrict their FDI growth and its impacts on ICT, in turn further affecting the prospect of FDI and linked growth to e-commerce.

Foreign Direct Investment (FDI) Links to ICT

The FDI definition used in this study is investment undertaken by an entity resident in one economy in an enterprise resident in another economy, with the objectives of obtaining or sustaining a lasting interest in the enterprise and exercising a significant degree of influence in its management (ABS 1998). Intensive research has been carried out to explain the causes and consequences of FDI and why multinational companies (MNCs) seek to embark on FDI. FDI is part of the different theories of internationalisation of the company, which Melin (1992) describes as an ongoing strategy process that determines the ongoing development and changes in an international firm.

FDI typically occurs in international industries where there are high barriers to entry and deploys itself in markets, especially in those of developing countries, where there are high degrees of concentration (Moran 2000). For these countries FDI may provide rents (in the form of high wages, benefits and profits), intangible assets (technology, marketing, best management practices, skill transfer) and potential spillovers and externalities that are highly beneficial for host-country economic growth (Moran 2000). Here, the issue of technology is crucial. Using Porter's value

chain model, FDI is essentially a decision as to which of the value chain activities will be located in host countries and which remain in the home country (Hollensen 1998).

Vernon (1966) assumes that FDI is a natural stage in the life-cycle of a new product from its inception to its maturity and eventual decline. He argues that most new goods are initially consumed and manufactured in the country where they are first developed, which in most cases is a developed economy. Vernon argues that by standardising their product on a world basis, firms can derive benefits from reducing or avoiding the costs of processing and interpreting the information that bears on the distinctive needs of individual markets; and they can capture the scale economies of production and marketing on a global scale (Vernon 1979). He stresses the degree of standardisation as evidence of maturation of the product. As the product reaches maturity in its home market, competition from similar products reduces profit margins of the producer in the home country. LDCs at this stage may offer competitive advantages for manufacturing in the form of lower unit costs. Vernon assumes that standardized products require a significant amount of input of labour, which is relatively cheaper in LDCs. From this new location the products will be re-exported to the home country.

The Investment Development Path (IDP) is based on the eclectic paradigm of Dunning and Narula (1996), that captures the dynamics of FDI but perhaps in a more contemporary framework than foreseen by Vernon (1979). IDP shows countries proceeding through five main stages of development with interacting FDI flows (Fig. 1). Countries can be classified according to their propensity to be net outward and/or inward direct investors. This propensity rests on:

1. The ownership specific advantages (O) of the indigenous firms of the countries concerned relative to those of firms of other countries;
2. The competitiveness of the country specific (L) resources and capabilities of that country relative to those of other countries; and
3. The extent to which indigenous and foreign firms utilize their (O) specific advantages jointly with the location-bound endowments of home or foreign countries through internalizing the cross-border market for these advantages, which are their perceived internalisation specific advantages (I).

Stage 1

During this stage the L advantages are insufficient to attract inward direct investment. Reasons for this could be limited demand levels because of low per capita income, inappropriate economic systems or government policies, inadequate infrastructure, poorly trained labour force. There is very little outward direct investment either, thus companies will only export to and import from these economies.

Stage 2

Inward direct investment rises while outward investment remains virtually non-existent. Countries' home markets might have grown in purchasing power or size.

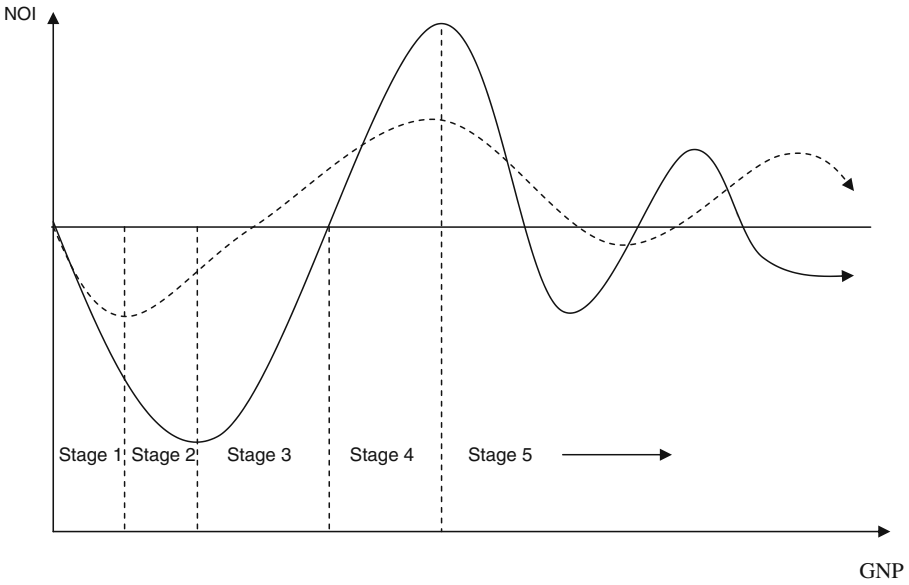

Fig. 1 *NOI*, net outward investment. *Solid line*, traditional line of development; *dashed line*, line of development, 1990's. Source: adapted from Dunning and Narula (1996)

Frequently, inbound FDI is stimulated by host governments imposing tariff and non-tariff barriers. FDI is likely to be restricted to natural resources and primary commodities. The L advantages of the country will have to rise in order to attract further investment. First, outward investment may arise which will be influenced by a home country's government push.

Stage 3

Countries in this stage show a gradual decrease of inward direct investment and an increase in outward direct investment. The technological capabilities of these countries are enhanced to the level of producing standardized goods. Domestic companies acquire their own competitive advantages and begin to compete with foreign firms in the same sectors. Outward direct investment will be directed to other companies which are in stages 1 and 2.

Stage 4

This stage is reached when the country's outward direct investment exceeds the quantity of inward investment from foreign firms. The rate of outward FDI is still growing faster than that of inward FDI. Domestic firms may now have considerable competitive advantages against foreign companies in the same sector, so that they cannot only compete in the home market against them but also have the capability to penetrate foreign markets. Outward FDI will continue to grow as domestic firms try to enhance their competitive advantage by moving operations abroad (e.g. cost advantages, proximity to new markets etc.).

Stage 5

In this stage the NOI of a country falls and then fluctuates around zero which means inward FDI roughly equals outward FDI. However, inward and outward FDI still grow in absolute terms. Countries in this stage are the highest developed with an abundance of multinational enterprise (MNE) activity. Cross-border transactions are internalized within the MNEs and not through the market itself. MNEs in this stage are increasingly globalised, thus not belonging to a specific country. As a result, any investment by these companies cannot be attributed to a specific country. Countries, which were once the lead countries in stage 4 are increasingly joined by other countries and consequently pushed into stage 5 of their IDP. Technological developments in one country directly affect the size as well as the nature of both inward and outward FDI inflows.

Two different net investment paths are depicted in Fig. 1 with the ability to attract FDI in stages 1 and 2 considerably reduced in the 1990s corresponding to the global but differential country growth and participation in ICT and e-commerce. Underlying this macro view of a compressed investment development path is a need to explore the likely environmental constraints that have arguably worsened for LDCs in this period.

The Importance of ICT Infrastructure

The e-commerce development path has been troubled, first by the collapse of the dot.com boom in 2001 and more recently, by an apparent disenchantment by investors with business adoption rates, relatively low trade volumes and arguably, low profitability in the B2B environment, at least prior to 2004 (EMarketer 2004). Expectations for an increased volume of transactions have tended to rest on an expansion of participants at the global level, a corresponding increase in the value of trade exchanges and increased profitability resulting, for example, from transaction costs economies. This contrasts with the fact that the bulk of e-commerce in developed countries continues to be generated by business-to-business (B2B) economic activity. In the US, for example, B2B e-commerce (defined as transactions by manufacturers and merchant wholesalers) accounted for 93% of all online transactions in 2004, (E-Stats 2006).

Reliance on ICT, particularly the Internet, to achieve value creating global linkages of stakeholders means that FDI and e-commerce will be vulnerable to the diversity of different countries with respect to their culture, demography and infrastructure. For example, ICT infrastructure in the form of telecommunications capacity and computing resources includes Web servers, application service providers and computers which support browser-based commercial transactions (OECD 2000a). It also includes the skilled workforce necessary to maintain, develop and support the on-line information systems that underpin e-commerce (ILO 2000). Such infrastructure is essential for attracting FDI and thereby achieving effective e-commerce participation in increasingly competitive world markets[1] (Matambalya

[1] While FDI may be required for financing ICT infrastructure, ICT was also argued not to be critical driver for corporate FDI decision by almost 80% of US businesses in 2001 (GBPC 2001).

and Wolf 2001). While some affluent countries may finance ICT infrastructure domestically, less affluent ones may require FDI for this financing.

The need to attract FDI to develop an ICT infrastructure itself capable of attracting FDI that seeks to take advantage of global e-commerce opportunities, is challenging, particularly when other types of infrastructure, such as housing, education, basic communications and energy, may be lacking. This challenge arises because the benefits (and costs) from infrastructural investment can be measured in terms of efficiency, equity and social welfare (Weisbrod 1997). Efficiency is associated with business costs and productivity gains. Equity refers to a better distribution of employment and income opportunities. Efficiency and equity gains can sustain strategic benefits associated with an improved competitive position in the global market and economic development. Finally, social welfare gains refer to other quality of life factors resulting from economic development. Hence, it is suggested that the digital divide amongst nations may combine with a cultural divide (Aisbett and Pires 2003) to distinguish between 'haves' and 'have-nots'.

Grounded on infrastructure efficiencies, developed countries benefit from higher levels of connectivity and preparedness where ICT usage is concerned, often supported by legal and regulatory frameworks and by government incentives. These countries host substantial FDI that seeks to benefit from the available ICT infrastructure. They have developed e-commerce facilities which allow for high participation rates. In contrast, coupled with poor infrastructure, insufficient availability of ICT services is an inhibiting factor for economic growth in less developed (or developing) countries (Addison and Heshmati 2004). Impeded by inadequate ICT infrastructure (inclusive of appropriately skilled people, technology and underlying processes), a lack of e-commerce facilities implies a lack of opportunity for generating online transactions. This may deter FDI by business in 'have-not' countries for which proximity to suppliers or markets might otherwise be advantageous.

There is little doubt that the distribution of FDI across developing countries is highly unequal (15 countries account for over 80% of FDI to developing countries), with the 49 least developed countries (LDCs) attracting only 0.3% of world FDI inflows in 2000 (UNCTAD 2001, p. xiii). It is possible that a lack of ICT infrastructure and low levels of e-commerce adoption in a country may have a wider transmission effect, making the country less attractive for FDI and helping to perpetuate an unfavourable e-commerce environment (Clarke 2002), with a negative influence on the country's economic growth (Saggi 2002). This particular investment trap may be only one contributor to a suppressed IDP facing developing economies and their development of e-commerce. The paper does not assume it is the most important factor bearing on the growth problems of LDCs but merely seeks to explain the constraints operating in relation to this investment trap.

The focus of attention in the literature is on the environmental forces that sustain the link between ICT and FDI and its influence on economic growth. However, this link may be better understood if the potential for e-commerce and ensuing business case for e-commerce participation are equally taken into account. The next section identifies and briefly discusses some of the main macro related issues that have the potential to inhibit the widespread uptake of e-commerce and hence, to affect FDI.

Macro Issues that Affect E-commerce and Related FDI

While there are several alternative explanations for FDI (Dunning 1977), the advantages of FDI are often expressed the same way as, or in association with, those of e-commerce, involving an increase in value to stakeholders. Borrowing from the classification used by Wood (2004) for e-commerce activities, e-commerce and FDI flows in a country can result from developmental or infrastructural activities, from entrepreneurial activities and from residual activities, as shown in Table 1. Developmental or infrastructural activities are associated with preparing the country for e-commerce up-take and participation by developing the necessary infrastructure. Entrepreneurial activities are associated with e-commerce participation itself. Residual activities are so named because they refer to activities associated with intra-company operations. They involve trade flows that are fast moving to the Internet (Zwass 1998). Hence a crowding-out like effect may occur with divestment in traditional e-commerce transactions being compensated by transactions using the Internet. Any inherent trade flows are commonly identified as 'traditional e-commerce' conducted with the use of electronic data interchange (EDI) over proprietary value-added networks. While they are not directly related to the argument advanced in this paper, they need to be noted because of their common inclusion in e-commerce statistics.

To benefit from e-commerce participation a country needs to establish and develop the necessary infrastructure, both ICT (including the Internet's World Wide Web as the prime driver of contemporary e-commerce) and general trade supporting infrastructure (e.g. roads, ports, energy and telecommunications). Where domestic investment is not available, governments may seek to attract FDI, for example by providing greater entry opportunities for foreign business through deregulation. While liberalization can attract FDI, not all such investment is equally advantageous for the host country. More beneficial FDI activities may require locational advantages and promotional effort by government, as well as national policies, such as the upgrading of technologies and skills (Gergely 2003, p.4). This is the case, for example, of the permission given to the Mexican company Telmex's mobile

Table 1 Activities influencing e-commerce and e-commerce related FDI

	E-commerce	E-commerce related FDI
Infrastructural/ developmental activities	Top-down marketing activities, probably initiated by government associated with infrastructure development, including ICT	Related to the development of an ICT infrastructure and other infrastructure needed for effective e-commerce
Entrepreneurial activities	Top-down marketing activities directed to promoting the country infrastructure and spurring e-commerce participation Bottom-up marketing activities, initiated by business, associated with exploring e-commerce opportunities	Related to deepening effective exploration of e-commerce activities by business
Residual activities	Some intra-company operations may involve trade flows using proprietary software (still considered e-commerce)	Divestment may occur because of traditional trade flows moving to the Internet

subsidiary to partner with the Swedish company Ericsson to introduce a wireless Internet service in Mexico (Kearney 2001, p.12).

Arguably, increased FDI involving infrastructural and developmental activities is needed in developing countries, before entrepreneurial investment can flow in. The World Bank estimated that the growth of telecommunications in developing countries over the period 1997–2002 would require an annual investment of $60 billion (World Bank 2003) due to lack of preparedness caused by a lack of the basic infrastructure in many of those countries.

Initiating the higher order entrepreneurial and infrastructural activities relating to both e-commerce and the attraction of e-commerce related FDI that can break the suppressed investment development path suggested by Fig. 1, requires addressing the constraints listed in Table 1. Based on a review of the relevant literature, Table 2 identifies macro issues influencing e-commerce and e-commerce related FDI that may cause such constraints. They are distributed over three categories based on whether they are essentially technical, legal and regulatory or socio-economic. Each category of issues is briefly discussed below.

Technical Issues

As with any exchange system, e-commerce requires a minimum of two electronically connected parties, as well as a sustainable support infrastructure (including roads, ports and distribution networks, reliable energy supplies, telecommunications, skilled labour supply and finance), for trade to occur. For e-commerce to achieve its potential, however, an effective participation worldwide is necessary. The technical issues concerning e-commerce participation relate mainly to differences in current and future technological capacity within and between countries with the focus of attention on the availability, convergence (including software integration) and sustainability of the technical infrastructure and manpower support needed for e-commerce participation. However, while considerations of a nation's technical potential to engage in e-commerce tend to focus on its ICT infrastructure, this is conditional on the availability and sustainability of an effective trade supporting infrastructure. A requisite trade infrastructure is often linked to a nation's ability to attract developmental or infrastructural FDI with Table 2 showing that many issues relevant to e-commerce are equally relevant for e-commerce related FDI.

In telecommunications, for example, excellent networks are essential for e-commerce to take place, but existing infrastructural limitations in many LDCs pose a real challenge for e-commerce to develop and to benefit from that development. For example, ICT does not exist in many poor and rural areas of developing countries while mobile phones are 29 times more prevalent in high-income countries (UNCTAD 2006). Although mobile telephony grew faster in non-OECD countries, their distance from OECD countries has been widening. Growth in Africa, in particular, has been negligible (OECD 2000b). For parity to be achieved globally less developed countries would need to overcome current infrastructural limitations, often by attracting suitable FDI flows.

For Internet hosts and users, the requirement of affordable access to ICT is as much a matter of making available appropriate technology and information content to potential users within countries as it is to encourage the use of the infrastructure

Table 2 Issues influencing e-commerce and e-commerce related FDI

	E-commerce	FDI (e-commerce related)
Technical issues	Availability and sustainability of support infrastructure	Availability and sustainability of support infrastructure
	Availability and sustainability of ICT infrastructure	Telecommunications (excellence, access cost)
	Telecommunications (excellence, access cost)	Internet hosts and users
	Internet hosts and users	Human capital
	Employment and skills	
	Security, reliability and protocols	
	Software integration	
Legal and regulatory issues	Taxation issues	Rules for entry and operations
	Policing	International trade agreements
	Trade laws and regulations	Investment agreements
	Legal "harmonization" and infrastructural "modernization"	Trade laws and regulations
	Setting standards	Coherence of trade policies and FDI
	Intellectual property, cyber-crime and consumer protection	Privatization policy
	Electronic signatures and potential cultural domination	Regulation of foreign affiliates
	Financing and access to credit	Competition policies
	Industrial relations constraints	Taxation issues
		Democratisation
		Governance
		Bureaucracy and red tape
Socio-economic issues	Internet access	Economic, political and social stability
	Privacy and security	Natural resources
	Trust	Market size, structure and growth
	Intangibility	Distance from and access to major markets
	Skills gaps	Availability and price of labour
	Cost justification	Income level per capita
	Going global	Economic environment
	Standardisation vs adaptation	Cost advantages
	Intercultural communication of information	Exchange rate
	Understanding stakeholders in cultural diversity	Export orientation
		Risk

Source: e-commerce issues extracted from Aisbett and Pires (2003). FDI issues sourced from UNCTAD (2003, p. 85)

and to provide users with the necessary skills to do so (Fife and Pereira 2002). These are areas where infrastructural FDI also has an important role to play. As with telecommunications, the gap between OECD countries and non-OECD countries is widening, since the level of technological achievement and diffusion of instruments of ICT, such as internet hosts and mobile telephony are major pull factors of FDI in high income countries (Gani and Sharma 2003). More recent research has found that secure Internet servers, deemed a rough indicator of e-commerce activity, are over 100 times more common in high income than in low income countries. Accessing the Internet in low income countries is 150 times more expensive than in high-income countries. Not surprisingly it is reported that a person in high-income

countries is over 22 times more likely to use the Internet than in low-income countries (UNCTAD 2006).

Where issues of employment and skills are concerned, governments have realized the role of a skilled labour force in constructing a resilient ICT infrastructure and the need to encourage IT skills development and IT literacy. In some developed countries, such as Australia, Canada and the US, addressing this skills gap includes targeting of IT skilled immigrants, many of whom are sourced from LDCs. Other solutions are found by using internationally dispersed teams of ICT experts, coordinated using the Internet and assisted by specialist project management software (Carmel 1999).

Overall, sourcing of ICT workers from LDCs has the dual effect of depleting the stock of IT skilled labour and of questioning the returns achievable from FDI directed to ICT infrastructure development in those countries. Reportedly, investment in ICT within LDCs appears to provide significantly lower returns than in developed countries (Dewan and Kraemer 2000), due to labour market inflexibility and human capital quality issues (Piatkowski 2002). However, the negative effect on this type of FDI may be counteracted by relocation of firms involved in development and maintenance of e-commerce systems to lower cost suppliers, such as India (Litan 2001).

Legal and Regulatory Issues[2]

Legal and regulatory issues for e-commerce refer to the conduct of commerce across national boundaries. Independent of the technologies involved, legislation for e-commerce involves much the same problems that have always been associated with trade in general, namely the complex and variable nature of the many laws and regulations that relate to commercial transactions within and across countries. But the newness of e-commerce justifies that the framework in which it operates is still somewhat ill-defined, in contrast to FDI which is generally highly regulated.

While trade regulations affect FDI, as indicated in Table 2, the link between legal and regulatory issues affecting e-commerce and FDI is not well established. Some analysts consider the link to be significant (Buch 2001; Lee and Mansfield 1996), while others dispute whether such a link exists (Altomonte 2000). However, no matter how feeble the link might be, long-standing efforts to harmonize international trade laws across countries, including tariffs and other barriers (hence relevant to commerce, FDI and other areas) have gained new impetus with the relatively cheap global reach and pervasiveness of e-commerce (United Nations 1996). For example, the reduction of barriers to trade has promoted the rapid growth of multinational corporations in the European Union (Zekos 2005), supporting the view that the degree of market openness is an essential determinant of FDI (Gani and Sharma 2003; Chakrabarti 2002).

Other important macro issues that influence e-commerce include infrastructural modernization, the setting of standards, regulation of intellectual property,

[2] See Aisbett and Pires (2003) for a more in-depth discussion of legislative and normative issues related to e-commerce.

cybercrime and consumer protection, electronic signatures and the potential for cultural domination (Aisbett and Pires 2003). In terms of e-commerce related FDI, flows are influenced by the rules regarding entry, operations and competition, foreign affiliates and privatization policies, investment agreements, taxation, coherence of trade and FDI policies, democratisation (Addison and Heshmati 2002), bureaucracy, corruption, red tape, law and order and quality of governance (Hossain 2000).

Socio-economic Issues

Economic management and social stability are key socio-economic factors influencing FDI, along with market driven issues. But there are a many *socio-economic* issues associated with e-commerce and e-commerce related FDI, namely the extent to which firms actually do operate globally and the problems that arise when they do. Then there are cultural differences in information needs and how information is best communicated.

Current cross-cultural marketing research has tended to focus on issues such as how information is viewed by different cultures, intercultural communication of public and commercial information and importantly, a firm's decision to focus on cultural diversity or "go global" (Pires and Stanton 2005). From a societal perspective, concern is about the growing "digital divide" and the penetration of foreign cultural norms. Culture affects preferences in information search and presentation, as well as affecting economic factors that ultimately constrain the ability to access the Internet and engage in e-commerce. The tension between standardisation and adaptation is exacerbated when markets are diverse, as is particularly the case with e-commerce.

In addition to culturally related issues, e-commerce participation is also influenced by concerns about privacy and security, by the intangible nature of value propositions when offered online, by the need to trust a 'new' global market void of perceived-risk reducing reassurances and ultimately, by the difficulty in justifying objectively the gains from e-commerce participation (Bingi et al. 2000).

Economic, political and social stability are positive influences on e-commerce related FDI flows (Kokko 2003). Their absence in LDCs may offset attractiveness arising from the availability of low cost skilled and unskilled labour, favourable exchange rates, an export orientation and other time-specific and country-specific effects (Gholami et al. 2005), including the size and rate of growth of the market (Chakrabarti 2002; Hossain 2000) and for some countries, proximity and access to major markets (Addison and Heshmati 2002).

In general, the drivers and impediments of e-commerce and FDI listed in Table 2 mostly consist of top-down activities associated with macro issues, commonly addressed by governments. Given contextual constraints determined by geography, demography, availability of natural resources and the level of development, effective management of those drivers and impediments should contribute to the creation of an environment attractive to developmental and infrastructural FDI and ultimately, to the provision of ICT infrastructure that enables e-commerce participation. Not addressed, is a process to transform potential e-commerce participation into actual participation. This process, as explained in discussing Table 1, may involve attracting entrepreneurial FDI in this case.

FDI and E-commerce: Cause or Effect?

Gholami et al. (2005) findings that, for developed economies, investment in ICT has a positive effect on foreign direct investment (FDI), but for developing economies FDI may cause ICT investment, is consistent with the conclusion that 'poorer countries may find themselves in a "low-ICT equilibrium trap". They cannot attract ICT intensive FDI because they do not have an ICT infrastructure to start with, and they do not have sufficient private or public resources to develop such an ICT infrastructure' (Addison and Heshmati 2002). Hence, it is argued that countries need to achieve a 'threshold level of development' (Blomstrom et al. 1994), a certain level of educational, technological and infrastructure development before they can attract FDI (OECD 2000b, p. 69, cited in Gholami et al. 2005).

Focusing on the indirect links between ICT, FDI and economic growth, it is also possible that growth may ensue from the use of ICT backed FDI for e-commerce. Because the Internet is global and e-commerce can readily cross national boundaries, the growth of e-commerce internationally can positively influence the economic growth of participating countries. Hence, the desire to benefit from e-commerce participation can be a strong motivator for the development of the infrastructure required for e-commerce to take place. This is consistent with countries such as Ireland, Hong Kong, Korea, Malaysia and Taiwan that have sought to develop competitive advantage in ICT related activities by attracting FDI directed at augmenting the stocks of technology and managerial expertise and improving the means of access to export markets (Fife and Pereira 2002; Lehman 2002). But focusing only on the ICT to FDI link can obscure the prior need in LDCs to attract FDI that targets the creation and development of infrastructure required for e-commerce to take place.

ICT infrastructure alone may not be sufficient to trigger e-commerce participation. This may require top-down, government initiated initiatives targeting domestic entrepreneurs by means of tax concessions, industry development funds and other incentives, as well as initiatives targeting entrepreneurial FDI. Following the World Investment Report (UNCTAD 2003), these may include country image building and investment promotion by means of investment-generating activities, investment-facilitation services, investment incentives and after-investment services, as well as measures directed at administrative efficiency, equity (e.g. anti-corruption, equality of treatment with domestic ventures) and expatriate amenities, such as bilingual schools and quality of life (UNCTAD 2003, p. 85).

Initiated by investors, entrepreneurial FDI may target the development of industries that can take advantage of the existing infrastructure, often building on links established through exports as a way of strengthening a market position (Hongxin and Levary 2002). For example, the growth in sales of a product in another country through electronic transactions may require a service system based in that country. Hence, the growth of services that can be supplied electronically to a global market also encourages FDI (Anonymous 2000, p. 37). This has generally been the case of FDI in East Asian economies (Xiaoquin and Dickie 2000).

Summing up, countries need a suitable ICT infrastructure if they are to engage in beneficial e-commerce activities. Hence, countries may seek to attract FDI that contributes to creating a business and technological environment favourable to e-

commerce development. Conversely, countries that can participate in e-commerce because they have the necessary ICT infrastructure are in a better position to attract FDI and to experience the transmission effects of economic development that come with this investment. This sustains claims by international development agencies that commercial applications of ICT have great potential to accelerate economic growth in developing nations (Wood 2004). Lack of an ICT infrastructure and consequent access to e-commerce, therefore prejudices a country's growth prospects (Anonymous 2000, p. 39).

Ultimately, since FDI involves increased foreign ownership likely to foster increased ICT infrastructure and use of the Internet and of e-commerce, the growth of FDI will influence the growth of e-commerce internationally. But the growth of e-commerce also stimulates FDI, as reflected in the fact that, between 1990 and 1999, the decade in which Internet communication and e-commerce matured, FDI trebled as a proportion of global GDP from 1% to 2.9% (Clarke 2002). The conclusion must be that the attractiveness of national markets for e-commerce is intertwined with their attractiveness for FDI.

Conclusion

This paper has sought to identify forces likely to explain the investment development path followed by LDCs, focusing on underlying macro problems that can hinder the attraction of e-commerce related FDI. The macro problems that reduce a country's attractiveness for e-commerce are problems that make it less attractive for FDI. However, the relationship goes further than that. FDI brings know-how and infrastructure that enable e-commerce, but conversely, an established e-commerce capacity in a country makes FDI more attractive. The potential global span of e-commerce means that failure to address the macro challenges might reduce existing levels of FDI as investors move to alternative locations, just as any other adverse socio-economic condition would. In terms of the IDP model, progression to advanced stages is retarded although the volume of FDI flows continues to increase.

The macro environment influences the growth rate of Internet access and the availability of local IT trained personnel, important criteria for those seeking to expand e-commerce markets. The IT requirements of both local and global e-commerce may stimulate FDI and create jobs in developing countries, as foreign companies take advantage of cheaper IT workforces. However, existing jobs in this and other sectors may also be lost or downgraded, as investors have more flexibility in sourcing goods and services.

The scope of e-commerce at the reach of firms in any country is bounded by other countries' limitations in participating in e-commerce. E-retailers seeking to target and offer better service to customers in different countries (Yoon 2002), US-national e-businesses seeking to target Spanish speaking customers outside the US (Disabatino 2000) and e-traders seeking to expand in markets that could be new engines for growth (Yoon 2002), all benefit from the widespread adoption of e-commerce. In this way, e-commerce indirectly encourages FDI that builds e-commerce capacity.

E-commerce has brought renewed attention to the need for legal and regulatory harmonization, which would facilitate FDI. Along with the variability in access rules and in taxation which have encumbered foreign investors, countries and states differ in the extent to which intellectual property is preserved, (cyber) crime pursued, or consumers protected. While progress is being made, the complexity of the existing situation means that change will be slow and that more targeted legislation that closes "loopholes" will not always encourage e-commerce.

E-commerce may have a potential global reach, but the world still remains culturally diverse. The ultimate onus for those pursuing e-commerce, as for any global player, is on cultural sensitivity and responsiveness facilitated by global marketing segmentation practices, because this enables business (as well as governments) to understand and deal with "difference". Some product offerings may be standardised and some may not but, at each step, more value can be afforded to stakeholders. Standardisation and globalisation are bound by a cultural and digital divide. There appears to be no clear indication that these divides will recede significantly in the foreseeable future.

Governments and international agencies seeking to increase investment need to take into account the role of e-commerce and the macro issues which affect its development. The fear of being left behind in the rapidly changing global economy concerns governments in industrialised and developing countries alike, because "countries that do not have an environment conducive to Internet usage and electronic commerce will be marginalized from the globalized production process and global economy, at increasingly great cost to their citizens" (Mann 2000, p.9). However, national capacities to develop e-commerce vary tremendously. The ability to build a successful IT industry in small industrialized countries is related to the extent of government IT promotion, the level of private sector investment in research and development (R&D) and the existence of an education system that produces IT literate graduates (Watson and Myers 2001). Without the R&D base and the skilled workforce, the main stimulus for e-commerce in developing countries is external. Foreign owned firms or firms which supply trading partners in industrialized countries, where there is good ICT infrastructure and payment services, are the most likely adopters. Technology transfer becomes critical for developing local skills (Clarke 2002).

Because the ability of countries to engage in e-commerce is tied both directly and indirectly to their attractiveness for FDI, strategically conceived government intervention is likely to be required to attract infrastructural or developmental FDI and then to attract effective entrepreneurial FDI. Just as e-commerce is a factor attracting FDI, foreign investment may be a prerequisite for e-commerce, particularly in developing countries. Infrastructure issues impeding e-commerce participation need to be considered on an equal footing when dealing with the links between ICT and FDI.

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