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Contents

Overcoming financing constraints to corporate expansion: evidence from a company in an emerging Islamic market

Bruce Hearn, Jenifer Piesse and Roger Strange *

The sourcing of low-cost finance to facilitate corporate expansion on competitive terms is a major challenge to firms from emerging markets. There are additional constraints in Islamic markets as financial instruments must adhere to sharia law. This paper examines the approach taken by the Sudan Telecommunications Company (Sudatel) to obtain cost effective equity financing using secondary listings on multiple Middle East and North Africa (MENA) stock exchanges. We compare the costs of equity for Sudatel stock on the Sudan and Abu Dhabi Exchanges, and compare these figures with those for Sudatel's two main regional competitors. Furthermore, we highlight the risk-return trade-off faced by investors in Sudatel stock on both Exchanges, and provide evidence of the potential benefits to investors from the overseas listing.

Key words: Islamic finance; emerging market finance; Sudan
JEL classification: N25, O16, P45

1. Introduction

The emergence of successful transnational corporations (TNCs) from developing and transition economies is a relatively recent phenomenon (Dunning et al., 1998; Sauvant, 2005; UNCTAD, 2006). However, much of the literature tends to focus on TNCs from Asia (see, for example, Lau, 2003; Buckley et al., 2007, Filatotchev et al., 2007), Latin America (Chudnovsky and López, 2000) and the transition economies of Eastern Europe (Svetlicic, 2004) and little is known about African TNCs. This group typically face many barriers to foreign expansion, for example protectionism in potential overseas markets, a lack of firm-specific technological and managerial skills, and difficulties in raising reliable, low-cost finance. This paper focuses on this last issue, and considers how a TNC can access sufficiently cheap capital to

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facilitate profitable overseas expansion. Financial markets in emerging economies are both small and illiquid, and potential domestic and foreign investors are discouraged by low returns and high volatility, resulting in a high cost of equity. Furthermore, firms based in Islamic economies face the additional constraint that financing must be compliant with sharia principles, which place strict conditions on the nature of financial instruments available to domestic companies. Balance sheet liabilities in the form of debt, including loans, securitized bonds or interest-bearing certificates, as well as certain asset provisions, such as fixed-term deposits or government bonds, are not available. These financing constraints provide additional challenges to TNCs with ambitious expansionist plans.

The paper is structured as follows. In section 2, the principles and key features that characterize Islamic financial markets are briefly reviewed, and the essential differences between Islamic and Western markets are highlighted. Many Islamic markets operate a dualistic approach in trading both Western and Islamic financial products, and Sudan and Iran are the only countries in the Middle East and North Africa (MENA) region to adhere exclusively to sharia directives relating to corporate capital structure. This paper thus focuses on the Sudan market and, in particular, on the case of the Sudanese Telecommunications Company (Sudatel) which has been pursuing a programme of expansion across Africa and the Middle East. Sudatel provides an apposite case to consider the effects of finance constraints because its major competitors – the Kuwaiti firm, Zain, and the Eqyptian firm, Orascom – in the MENA markets have both raised capital through Western financial instruments, and both have much lower costs of capital. The recent history of Sudatel's expansion is outlined in section 3, together with information about the company's sources of finance. Section 4 highlights the important characteristics of the national stock exchange in Khartoum and the other stock exchanges in the MENA region on which Sudatel is listed. The data sources and methods used to measure the cost of equity and the transactions costs are discussed in section 5. The results in section 6 show that there are benefits to raising finance on the Khartoum and Abu Dhabi Stock Exchanges, and that there is the potential for investors to diversify risk by holding a combination of Sudatel stock with others listed on a selection of MENA markets. Such a strategy provides a benefit to the firm, which may be a good model for other TNCs from emerging Islamic economies. The policy implications are discussed in section 7. The final section concludes.

2. Islamic financial markets

The Islamic financial system is founded on a set of principles (sharia) that govern the economic, social, ethical and religious aspects of an Islamic society (Iqbal, 1997). Whereas Western financial systems concentrate primarily on the economic and financial aspects of transactions, the Islamic system embraces wider concerns of social justice and equality. The basic principles of the system are fivefold. The first is the prohibition on the payment of any fixed, pre-determined rate of return on a financial transaction, that is, a return that is guaranteed regardless of the performance of the investment. This effectively rules out the charging of interest (*riba*), and the use of debt-based financial instruments. As Iqbal (1997, 43) notes, "Islam encourages the earning of profits but forbids the charging of interest because profits, determined *ex post*, symbolize successful entrepreneurship and creation of additional wealth whereas interest, determined *ex ante*, is a cost that is accrued irrespective of the outcome of business operations and may not create wealth if there are business losses. Social justice demands that … the process of wealth accumulation and distribution be fair and representative of true productivity". The second is profit-and-loss sharing, which requires that all suppliers of funds share the risks on any business venture in return for a share of the profits from the enterprise (Aggarwal and Yousef, 2000). The third is the prohibition on speculative behaviour *(gharar*) (El-Din and El-Din, 2002; Metwally, 1984). The fourth is the sanctity of contracts, with contracts upheld both in spirit and according to the letter of the law. Partners are expected to share relevant information, and to contribute wholeheartedly to the success of the venture. The final principle is that investment in certain activities, for example, those concerned with gambling or alcohol is prohibited.

These principles have given rise to a range of distinctive Islamic financial instruments, which include partnership (*musharaka*), profit-sharing agreements (*mudarabah*), leasing (*ijara*), and cost-plus financing (*murabaha*). The first two instruments are widely used for long-term financing,[1] whilst the latter two are used more for short-term

[1] *Mudarabah* contracts involve banks providing capital while the entrepreneur contributes effort and retains complete control over the business venture. In the event of a loss, the bank earns no return and correspondingly the entrepreneur receives no compensation for effort. If the project is successful then the gains are equally split between the parties according to a pre-transaction negotiated percentage formula. The principle of *mudarabah* contracts can also be extended to individuals placing deposits with banks and receiving a pre-specified return from the proceeds of these deposits (Kuran, 1986). In *musharaka* contracts, the bank and the entrepreneur jointly supply capital as well as exercise control and supply management expertise to the project. Losses are in proportion to the individual capital contributions of the two parties

financing.[2] The critical difference between these finance instruments and those prevalent in Western markets is that the emphasis in both their design and use is that of partnership and a sharing of the responsibility and risks immediately incurred from the management of industrial projects. As a consequence, the financier is implicitly expected to undertake an equal role alongside the entrepreneur in the management of the company, even if this role is largely relegated to being a sleeping partner. *Musharaka* contracts are also common in Islamic venture capital financing, where longer-term partnerships and the active involvement by the venture capitalist in the management of the firm are considered critical to success (Suwailem, 1998). Two further less common instruments are *mugawla* and *salam* financing.[3] In addition, firms in Islamic markets are subject to *zakat* as well as standard taxation; *zakat* is explicitly mentioned as one the five central pillars of Islam (Kuran, 1986), and is collected to facilitate the equitable redistribution of income and wealth.

Clearly, there are basic differences between Islamic financial markets and those in the West. First, the ban on *riba* not only prohibits debt as a source of capital but also means it is not appropriate to use any of the standard models in finance theory to calculate the cost of capital. For example, the Capital Asset Pricing Model (CAPM) requires

while profits are negotiated freely (Aggarwal and Yousef, 2000). Aggarwal and Yousef (2000) loosely contrast *mudarabah* instruments to a limited partnership and *musharaka* contracts to a traditional equity stake with additional rights of control.

[2] *Murabaha* contracts involve the bank purchasing an asset (e.g. production equipment) on behalf of the entrepreneur. The bank resells the asset to the entrepreneur at a predetermined price that covers the original cost and an added, negotiated profit margin. Payment is made either by a future lump-sum cash redemption, or in instalments, and full ownership over the tangible assets resides with the bank until all outstanding payments have been made. *Ijara* financing is commonly used in more specialist applications such as industrial leasing. Contracts are formed where the bank again purchases the tangible assets and allows the entrepreneur to use it for a fixed charge. Ownership of the asset either remains with the bank or is gradually transferred to the entrepreneur in a rent-to-own contract (Aggarwal and Yousef, 2000). Although the use of such instruments is permitted, there are concerns about whether such instruments, in providing a fixed return to the bank, are similar to debt contracts and are thus inconsistent with sharia principles. See Kamali (2007) for a discussion of *ijara* instruments and their regulation.

[3] *Mugawla* financing involves a contract between the party undertaking a work-related function and the owner of the project providing the capital (including materials). The price of the work under contract and the terms of payment must be specified at the outset, and payment may be made in advance, after completing the work, or in instalments as the work progresses. *Salam* financing is common in the agricultural sector where a contract is made between the supplier of fungible goods and the financial institution acting on behalf of the ultimate buyer. The key objective of this contract is to fix a price for a delivery of goods at a fixed future date (Mannan, 1993).

a risk-free rate of return, which does not exist. Second, the acquisition of superior information that can be used to benefit firms and investors is an acceptable practice in Western markets, provided that the information is not obtained from by insiders. Firms seek to retain confidentiality over certain aspects of their activities, while market analysts seek to elicit this information through in-depth research (Naughton and Naughton, 2000), hoping to use this before other market participants. In contrast, disclosure of information is considered a moral duty in Islamic markets, to mitigate issues of information asymmetry, moral hazard and incomplete contracts (El-Din and El-Din, 2002). On one hand, this lessens the scope for agency conflicts and promotes greater efficiency but, on the other, it may discourage investments by institutional investors who rely on superior information in order to gain an advantage. Thus, Western markets typically exhibit weak-form efficiency, a condition on which the CAPM is based, whereas the degree of information disclosure in Islamic markets suggests indirect strong-form efficiency (Fama, 1970).[4]

A third difference concerns speculative activity (*gharar*). In Western markets, moderate levels of speculative activity are regarded as essential to maintaining market equilibrium and to allow prices to reflect available information, that is, weak-form efficiency (Fama, 1970). The Western model assumes incomplete contracting, and a price discovery process facilitated by appropriate regulations regarding disclosure requirements and supported by arbitrage activity. In contrast, the Islamic model does not favour speculative and arbitrage activity, requiring a single entity to interface with the market (Mannan, 1993). One implication is that small shareholders do not play a significant role in Islamic securities markets, as their interests are likely to be short-term gains rather than lower-return social projects. In consequence, most share exchanges take place between large blockholders. Finally, there is a difference in the nature of the equity contract itself. In the West, it is generally agreed that the contract provides an entitlement to ownership of a firm in a legal environment that enables third party contracting and investment. In contrast, Islamic economists prescribe a system, reinforced by Islamic commercial jurisprudence, based on risk-sharing partnerships on an individual basis (Kuran, 2004). One consequence is that the modern Middle Eastern business environment is dominated by small and family-owned firms, with larger companies

[4] However, Onour (2002) found little evidence of weak, semi-strong, or strong-form efficiency using Khartoum Stock Exchange data.

being either foreign TNCs, foreign joint ventures or privatized state-owned enterprises.

In short, an exclusive reliance on Islamic financial instruments is likely to raise the cost of capital above that of firms which avail themselves of both Western and Islamic financial instruments. The cost of capital will be further raised in small and illiquid markets. These propositions will be examined below in the context of the Sudan Telecommunications Company (Sudatel).

3. The Sudan telecommunications company

The Government of Sudan adopted free trade policies and introduced a denationalization policy to revitalize the moribund national corporations in the early 1990s. One of the first sectors to be reformed was the telecommunications industry and, in October 1997, the shares of the State-owned National Wire and Wireless Corporation were listed on the Khartoum Stock Exchange, and the corporation was renamed the Sudan Telecommunications Company (Sudatel). The Government initially retained a majority controlling shareholding of 66.7%, and there were just 39 shareholders. Sudatel obtained secondary listings on the Bahrain[5] and Abu Dhabi Stock Exchanges in November 2000 and January 2003 respectively. These secondary listings enabled the Government to reduce its shareholding to 26% by 2005, with the remaining 74% distributed between 10,000 private shareholders.

The company initially pursued a vertical integration strategy, taking substantial cross-holdings in Saudi Arabia's Arab Submarine Cables Company to gain access to Arabian and Gulf region markets, and the Electronic Banking Services Company that specialized in payment systems. There were also a number of domestic Sudanese companies involved in satellite and mobile communications technology engineering (Sudatel Financial Statements, 2007). Additional services range from internet provision to remote high schools to the introduction of university distance learning programmes and other outreach activities in the education sector. Major projects such as the completion of an undersea communication cable under the Red Sea between Sudan and Saudi Arabia have been undertaken in combination with technical assistance from overseas partners such as British Telecommunications

[5] Sudatel was the first non-GCC (Gulf Cooperation Council) company to obtain such a listing.

and the French company Alcatel (Sudatel website, 2008). The strategy, combined with implicit government and legislative support, further reinforced the monopoly position of the company, which completely dominated the domestic market.

More recently, Sudatel has begun to expand overseas across the Sahel and Maghreb regions of Africa. Many African countries have recently experienced a phenomenal growth in demand for mobile and telecommunications technology in what were previously immature and unsaturated markets. Between 2007 and 2008, Africa experienced a 40% increase in subscriptions to mobile technology, with the greatest increases in the West (50%), East (48%), Central (45%) and Northern (41%) regions, with the Southern region (18%) rather behind (Africa and Middle East Telecom week, 2008). Furthermore, many of these telecommunications markets had been deregulated and former State-owned enterprises had been privatized. Sudatel expanded into Mauritania through a US$105 million acquisition of the controlling shareholding (60%) and the operating license of Chinguitel Telecom Company, followed by a successful bid in 2007 of US$200 million for a license in Senegal. Further expansion across West Africa has continued in 2008, raising US$1.75 billion in additional equity capital by bonus and rights issues in Abu Dhabi and Bahrain (Al Zawya, 2008) and the establishment of a holding company, Expresso Telecom, which in turn owns Ghana's Kasapa Telecom (Sudatel Management Report, 2008). Additional bids during 2008 have been submitted for a Niger mobile phone company as well as telecommunications operators in Nigeria and the Democratic Republic of Congo (Reuters, 2008).

But Sudatel also faces significant competition in its overseas expansion plans, notably from Zain and Orascom – see table 1. Zain, formerly the Mobile Telecommunications Company of Kuwait, dominates many markets across Africa and the Middle East, and is able to source equity finance through its primary listing on the large and liquid Kuwait Stock Exchange. Similarly, the Orascom Corporation has financed its regional expansion through a combination of a primary equity listing on the Egyptian Stock Exchange, and a secondary listing on the London Stock Exchange. The ability to raise large amounts of equity finance at cheap rates is a critical determinant, both in terms of

implementing expansion strategies and of accessing geographic regions for which operating licences are affordable and sought (Al Zawya, 2008).

Table 1. Foreign affiliates owned by Sudatel, Zain and Orascom, 2007

Market	Sudatel (Sudan)			Zain (Kuwait)			Orascom (Egypt)		
	Firm	Ownership	Mkt. Share	Firm	Ownership	Mkt. Share	Firm	Ownership	Mkt. Share
Panel 1: North African Markets									
Sudan	Sudatel	100	51%	Zain (formerly Sudatel – Mobitel)	100%	49%	-- --	-- --	-- --
Algeria	-- --	-- --	-- --	-- --	-- --	-- --	Djezzy	96.81%	63.2%
Tunisia	-- --	-- --	-- --	-- --	-- --	-- --	Tunisiana	50.00%	49.1%
Egypt	-- --	-- --	-- --	-- --	-- --	-- --	Mobinil	28.75%	47.4%
Panel 2: Sub Saharan African Markets									
Burkina Faso	-- --	-- --	-- --	Zain Burkina Faso	100%	57%	-- --	-- --	-- --
Chad	-- --	-- --	-- --	Zain Chad	100%	60%	-- --	-- --	-- --
Dem. Rep. of the Congo	-- --	-- --	-- --	Zain DRC SARL	98.50%	41%	-- --	-- --	-- --
Congo	-- --	-- --	-- --	Zain Congo	90%	76%	-- --	-- --	-- --
Gabon	-- --	-- --	-- --	Zain Gabon	90%	63%	-- --	-- --	-- --
Kenya	-- --	-- --	-- --	Zain Kenya	80%	33%	-- --	-- --	-- --
Malawi	-- --	-- --	-- --	Zain Malawi	100%	68%	-- --	-- --	-- --
Niger	-- --	-- --	-- --	Zain Niger	80%	74%	-- --	-- --	-- --
Sierra Leone	-- --	-- --	-- --	Zain S.L	100%	45%	-- --	-- --	-- --
Uganda	-- --	-- --	-- --	Zain Uganda	100%	32%	-- --	-- --	-- --
Zambia	-- --	-- --	-- --	Zain Zambia	88.88%	79%	-- --	-- --	-- --
United Rep. of Tanzania	-- --	-- --	-- --	Zain Tanzania	60%	39%	-- --	-- --	-- --
Madagascar	-- --	-- --	-- --	Zain Madagascar	100%	32%	-- --	-- --	-- --
Nigeria	Intercellular	75%	-- --	Zain Nigeria	65%	29%	-- --	-- --	-- --
Ghana	Kasapa Mobile	under negotiation	3.8%	Western Telesystems Ltd.	75%	-- --	-- --	-- --	-- --
Mauritania	Chinguitel	60%	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Senegal	Expresso	100%	33%	-- --	-- --	-- --	-- --	-- --	-- --
Zimbabwe	-- --	-- --	-- --	-- --	-- --	-- --	Telecel Zimbabwe	100%	-- --
Panel 3: Middle East and World Markets									
Kuwait	-- --	-- --	-- --	Zain MTC	100%	57%	-- --	-- --	-- --
Jordan	-- --	-- --	-- --	Zain Jordan	96.52%	43%	-- --	-- --	-- --
Iraq	-- --	-- --	-- --	Zain Iraq	30%	70%	OIH (Iraq)	100%	-- --
Bahrain	-- --	-- --	-- --	Zain	56.25%	44%	-- --	-- --	-- --
Lebanon	-- --	-- --	-- --	MTC Lebanon	-- --	50%	-- --	-- --	-- --
Saudi Arabia	-- --	-- --	-- --	Zain Saudi Arabia	25%	-- --	-- --	-- --	-- --
United ArabEmirates	Expresso Group	100%	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Pakistan	-- --	-- --	-- --	-- --	-- --	-- --	Mobilink	100%	36.4%
Bangladesh	-- --	-- --	-- --	-- --	-- --	-- --	Bangalink	-- --	21.6%
Dem. People's Rep. of Korea	-- --	-- --	-- --	-- --	-- --	-- --	CHEO	75%	-- --

Source: Consolidated Financial Statements (December 2007) Mobile Communications Company KSC, Kuwait. Annual reports for Sudatel obtained from Abu Dhabi stock exchange and Orascom (Egypt) from Thomson.

At the end of 2007, the Sudatel balance sheet was dominated by equity (see Table 2). Total assets were US$2,443m, of which US$1,791m (73%) was financed by equity. Current liabilities were US$298m, and non-current liabilities US$354m. The major part of these liabilities relates to Islamic financial instruments, in particular 98% of the non-current liabilities. Much of this Islamic finance share is tied up in murabaha contracts, which relate to the "property, plant and equipment" in the balance sheet. The extension of murabaha financing for equipment was in the form of collateral deposits. Some of the finance for the recent overseas expansion was obtained through banks. The Sudanese Al Salam bank provided a sharia compliant "loan" repayable in six equal "profit" instalments of US$40 million commencing three years after the Chinguitel acquisition. Similar facilities have been sought to finance the expansion into the other Maghreb and West African markets. But most of the additional financing has come from the secondary listings.

Table 2. Sudatel's consolidated balance sheet, end 2006 & end 2007
(Millions of dollars)

	2007	2006
ASSETS		
Non-current assets	1,662	1,366
Current Assets	781	951
TOTAL ASSETS	**2,443**	**2,317**
EQUITY AND LIABILITIES		
Equity	1,790	1,971
Minority interests	1	2
	1,791	**1,973**
Non-current liabilities	**354**	**106**
of which, non-current portion of Islamic finance	348	103
Current liabilities	**298**	**238**
of which, zakat provision	40	44
current portion of Islamic finance	97	121
	298	**238**
TOTAL LIABILITIES	**652**	**344**
TOTAL EQUITY AND LIABILITIES	**2,443**	**2,317**

Source: Abu Dhabi securities exchange website

The secondary listing in Abu Dhabi allowed Sudatel to raise additional capital and achieve much higher levels of liquidity for its stock – see table 3 – increasing the attractiveness of the firm to foreign investors. The Abu Dhabi securities exchange, in line with most MENA securities markets, supports trading in both contemporary Western financial instruments as well as those that are Islamic sharia compliant. An analysis of the holdings of the stock listed in Abu Dhabi shows that over 70% of the shares are held by Arabs from outside the Gulf Cooperation Council (GCC) region. Furthermore, the free-float market capitalization ratio for this stock is extremely low (under 5%) indicating the presence of major blockholders as opposed to a more diversified ownership base comprising retail and institutional investors. In contrast, the secondary listing in Bahrain exhibits quite different characteristics from that of Abu Dhabi. The market capitalization of this listing is only a fraction of the primary listing in Khartoum and the secondary listing in Abu Dhabi, and the turnover ratio is consistently zero. This lack of trading suggests that the intention behind this listing was fundamentally different from that in Abu Dhabi. It is likely that the strategy behind the Bahrain listing was to attract high net-worth individual Arab investors through the provision of a possible investment exit strategy. The listing would provide investors with high quality information, such as annual reports and interim financial statements, disseminated through the exchange, together with a route through its own marketing and education campaigns that act as a ready source of buyers should longer term investors seek to sell their stock.

Table 3. Listed Sudatel Stock, 2003–2007

	2003	2004	2005	2006	2007
Market Capitalization (millions of dollars)					
Khartoum	589.08	946.48	1,743.01	1,610.87	1,551.18
Bahrain	-- --	-- --	131.25	130.36	130.36
Abu Dhabi	1,123.30	1,640.03	2,653.04	2,283.37	2,388.76
Traded Value (millions of dollars)					
Khartoum	-- --	97.165	-- --	126.16	131.45
Bahrain	-- --	-- --	0.00	0.00	0.00
Abu Dhabi	20.31	165.84	1,106.21	442.99	503.59
Turnover Ratio (%)					
Khartoum	-- --	10.26%	-- --	7.83%	8.47%
Bahrain	-- --	-- --	0.00%	0.00%	0.00%
Abu Dhabi	1.81%	10.11%	41.70%	19.40%	21.08%

Source: Compiled by the authors from the Arab Monetary Fund, Khartoum, Bahrain and Abu Dhabi Stock Exchange websites

4. The MENA securities markets

The MENA securities markets are characterized by their small size relative to GDP and illiquidity, with trading concentrated in a small number of blue-chip stocks, shown in table 4. All are based on the institutional design of contemporary Western financial markets although many have a separate Islamic segment where sharia compliant instruments are traded. The Saudi Arabian Tadawul Stock Exchange is the largest and accounts for over 43% of the region's total market capitalization. The Kuwait Stock Exchange ranks second and accounts for 16% of the region's market capitalization and has the highest ratio of market size to GDP and the highest turnover. In contrast, the four North African markets of Algeria, Egypt, Morocco and Tunisia together only account for 12% of listed capital in the region. Markets with the lowest market capitalization to GDP ratios are Iraq, Tunisia, Sudan, Algeria and Lebanon. In these countries, business finance is dominated by their national banking sector. For instance, the Bourse de Tunis only provided 5% of the funds needed by local businesses in 2007 (Bourse de Tunis, 2008) and the Stock Exchange in Algeria attracted three listings since its establishment in 2003. This exchange is not regarded locally as a significant capital-raising venue.

Table 4. The importance of selected MENA stock exchanges, 2005

Stock Market	Established	Market capitalization (millions of dollars at 2005 prices)	Market capitalization as percentage of GDP	Turnover ratio (%)
Saudi Stock Market	2007	157,306.44	73.35	10.08
Kuwait Stock Exchange	1962	59,528.01	142.58	10.55
Abu Dhabi Securities Market	**2000**	**30,362.51**	37.85	0.46
Egypt (Alexandria/ Cairo)	1888/1903	27,847.48	39.26	1.81
Doha Securities Market	1997	26,702.11	130.73	1.36
Dubai Financial Market	2000	14,284.23	17.81	1.95
Bourse de Casablanca	1929	13,050.18	29.48	4.31
Amman Stock Exchange	1999	10,962.98	110.19	3.55
Bahrain Stock Exchange	**1989**	**9,701.77**	100.99	0.27
Muscat Securities Market	1988	7,246.23	33.56	1.49
Iraq Stock Exchange	2004	2,686.94	3.06	0.48
Bourse de Tunis	1969	2,439.55	9.07	1.03
Khartoum Stock Exchange	**1995**	**746.56**	3.92	1.31
Algeria Stock Exchange	2003	143.64	0.22	0.01
Beirut Stock Exchange	1920	0.99	0.01	0.60
TOTAL MENA		363,009.62		

Source: Compiled by the authors from national stock exchange websites and the Arab Monetary Fund.

Note: (1) Exchanges highlighted in bold are those that act as outlets for dual-listed Sudanese assets.
(2) The data on Iraq are collected direct from the exchange website.
(3) Although the Saudi stock market existed in an informal capacity since early 1990s, the Tadawul stock exchange was only established in 2007

The Sudan Stock Exchange in Khartoum is the primary source of equity finance for domestic Sudanese firms, and it has witnessed a steady growth in both listings and activity since its establishment in October 1994 – see table 5. Listings have risen from 34 in 1995 to 48 in 2004, and increased further to 52 in 2008. Nevertheless, the Exchange has a low market capitalization, both in absolute terms and as a percentage of GDP. A secondary equity market was established in January 1995, but was further split into organized and parallel markets in 1999, with regulation regarding disclosure requirements significantly lighter on the latter in order to attract a wider range of smaller firms. Additional formal market segments also exist for exchange traded funds and Government musharaka and shihama certificates.[6] In addition to the formal exchange-based markets, there is also a smaller over-the-counter market operated outside exchange trading hours between brokerage companies licensed by the Bank of Sudan, where orders are relayed via the local telephone network.

The Khartoum equity market is highly concentrated with Sudatel dominant in terms of market capitalization (63%) and trading activity (74%) in 2004.[7] The 1997 Sudatel listing resulted in an increase in total market capitalization from US$32 million to US$139 million in a month. During 2004, the Sudatel stock was traded on all 244 working days, whilst the next-highest turnover ratio (11.44%) was that of Sudanese Free Zones & Markets, which traded for 44 days. Other stocks, such as Gum Arabic Company and the Sudanese Islamic Investment Bank, were frequently traded at 79 days and 56 days, respectively, but these lacked size and value. Table 5 demonstrates that the value of primary

[6] *Shihama* certificates are a form of equity-based financial instrument, introduced by the Central Bank of Sudan in 1998. They are mainly used to generate finance for central government projects, with the government selling shares in companies that it (partially or completely) owns. *Shihama* certificates are profit-and-loss sharing agreements, but are redeemable on request even though the holders are theoretically permanent partners. The *shihama* certificates are issued both through periodic Bank of Sudan auctions as well as on the Khartoum Stock Exchange, where they collectively accounted for 25% of traded value in 2004. There is also considerably less concentration of trading activity, indicating a higher degree of liquidity than with other market segments.

[7] The local market also has a highly concentrated brokerage industry with one broker. The Financial Investment Bank was established in 1997 through a government initiative to assist domestic stock market investment and accounts for 86% of the capitalisation of the brokerage industry. Brokerage is dominated by government control and lacks sufficient capitalisation for market development. This is a serious concern as local brokers are unable to provide underwriting for the primary market, prevent pricing gaps from dual-listed stocks or offer custodial services, which are essential to attracting foreign investors (Kenny and Moss, 1998).

Table 5. Descriptive statistics - the Sudan Stock Exchange, 1995–2006

DATA	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Primary market: funds raised (millions of dollars)	65.16	5.27	2.06	13.75	23.52	38.29	30.15	157.85	62.97	109.06	-- --	-- --
Secondary market: Listed companies	34	40	41	42	43	44	44	46	47	48	49	51
Secondary market: Shares traded (millions)	115.726	24.909	164.818	11.674	198.569	14.169	8,768.897	4,060.237	9,745.457	2,185.994	142.875	5,032.22
Market capitalization (millions of dollars)	44	32	139	111	237	392	457	593	741.22	2,058.42	3,241.64	3,563.49
Value traded (millions of dollars)	3.50	0.68	3.33	1.00	6.20	23.01	64.02	95.00	93.76	178.04	24.51	51.46
OTC market: Number of shares (millions)	0.485	2.064	2.332	3.386	3.996	3.583	226.955	351.364	167.252	791.922	-- --	-- --
RATIOS												
Market capitalization/ GDP (%)	-- --	-- --	-- --	1.32%	2.22%	3.40%	3.56%	4.02%	4.34%	6.96%	-- --	-- --
Market capitalization/ money + quasi-money (%)	0.00%	0.01%	0.02%	0.08%	0.03%	0.04%	0.47%	0.05%	0.14%	10.28%	-- --	-- --
Traded value / market capitalization (%)	7.98%	2.14%	2.39%	0.90%	2.86%	5.86%	14.01%	15.97%	12.65%	12.13%	0.75%	1.44%
OTC market / formal secondary market (%)	0.42%	8.29%	1.41%	29.00%	2.01%	25.29%	2.59%	8.65%	1.72%	36.23%	-- --	-- --

Source: Compiled by the authors from the Arab Monetary Fund, Bank of Sudan Annual Reports, and the Khartoum Stock Exchange website. Values for 2005, 2006 obtained from Al Zawya.

market issues has, with the exception of the three years between 1996 and 1998, had an annual value over US$23 million. Secondary market capitalization has also risen from an initial US$44 million in 1995 to US$2,058.42 million in 2004 and levels of secondary trading have also increased, although to a lesser extent (US$3.5m in 1995 to US$178.04m in 2004). Activity in the fledgling OTC market is often less than 10% of that on the formal stock exchange. Both the market capitalization to GDP ratio and the market capitalization to money plus quasi-money ratio are critical in evaluating the impact of the market faced by the local business community wishing to raise funds. The market capitalization to GDP ratio is extremely low, less than 7%, which is in line with many small developing African markets (Piesse and Hearn, 2005). Liquidity is also very low on the Khartoum Stock Exchange, although there is a notable increase in the turnover ratio from less than 7% prior to 2000 to over 14% following the introduction of government finance certificates in 2001 that increased domestic awareness of exchange-based investment products (KSE Annual Report, 2004).

The market capitalization to money plus quasi-money ratio confirms that the stock market is very small, and highlights the relative size and dominance of the banking system in the provision of corporate finance. Relationship-based bank finance dramatically increased from US$20 million in 1998 to US$4,860 million in 2006. Murabaha contracts are the most common form of finance, accounting for over 39% of funding, while musharaka contracts often account for between 20% and 30% of funding resources. Mudarabah and salam contractual arrangements are considerably less common, and each generally accounts for up to 6% of banking sector funding. Finally, other more specialized forms of contractual arrangements (including ijara and mugwala contracts) together account for the residual 12-20% of bank-based funding. Financing by murabaha contracts had the biggest increase in absolute terms between 1998 and 2006, although the relative proportions provided by each contract type remained relatively constant.

5. Data and methodology

5.1 Data

All data have been obtained through internet-based sources, including the Arabic and English language areas of the Khartoum Stock Exchange and the Arab Monetary Fund (AMF) websites. Monthly stock prices for Sudatel's Khartoum listing are from Khartoum via the AMF. Monthly stock prices, dividend and corporate action details for

the secondary listings in Bahrain and Abu Dhabi are from the exchange websites and Bloomberg. The total returns indices for the Khartoum and Abu Dhabi listed stocks were generated using the Standard & Poor's (S&P) method. Exchange rates and total returns are from Datastream and include the S&P Saudi Arabia, S&P Bahrain, S&P Egypt, S&P Oman and the MSCI World indices.

5.2 Cost of Equity Measurement

Two different methods are used to estimate the cost of equity for the Sudatel stock listed on the Abu Dhabi and Khartoum Stock Exchanges. The first method is based on the mean-variance framework proposed by Markowitz (1959) and the Capital Asset Pricing Model (CAPM) of Sharpe (1964) and Lintner (1965). This paper follows Collins and Abrahamson (2006) where the beta measure obtained using linear regression is replaced by a ratio of the risk of the stock, or standard deviation, to the market. As in Collins and Abrahamson (2006), the MSCI World index denominated in Saudi Arabian Rials represents the market and a one-month Saudi Arabian yield is used to proxy the risk-free rate. All returns series are in Saudi Rials.

Collins and Abrahamson (2006) assume market equilibrium under conditions of risk (Sharpe, 1964) and take account of both options faced by investors and the optimal valuation of assets (Lintner, 1965). Following Mossin (1969) and Cheng and Grauer (1980), the simple model can be summarized with the cost of equity measure as:

$$CE_i = R_f + RM_i(RP_w) \quad (1)$$

where CE = the cost of equity;

R_f = the international risk-free rate, which in this case is the Saudi Arabian

4-week Treasury yield;

RP_w = the world market risk premium, which is taken to be 4.43% and is calculated over a long period from 1991 to 2008 in line with the estimation by Karolyi and Stulz (2003) for a similar period.

The standard deviation is a measure of risk, and incorporates both systematic (un-diversifiable market-related) and non-systematic risk (diversifiable company or industry-specific risk). Since this is a symmetric measure, equal weight is given to upside and downside risk

and thus a cost of equity measure provides an upper bound measure. Hence, RM_i in equation (1) is equal to σ_i / σ_w, where σ_i is the standard deviation of the total returns of the Khartoum or the Abu Dhabi listing of Sudatel, and σ_w is the standard deviation of the MSCI World index.

As noted above, the use of the CAPM presents a major difficulty in Islamic markets as the risk-free rate of interest cannot be specified. Mean-variance theory assumes risk-free borrowing and lending and the construction of a market portfolio in returns that are in excess of the risk-free rate. However, this problem may be circumvented by using the Saudi Arabian risk-free rate. Saudi Arabia operates a split system, operating in both Islamic and Western financial markets. Given the Saudi market dominates the MENA region and sovereign short-term debt is both available and traded, the Saudi Arabian rate is a good estimate of a regional risk-free rate. A more serious problem is that mean-variance theory rests upon the assumption of weak-form efficiency, which is a critical assumption in the CAPM. Difficulties arise here both in the context of emerging markets, where illiquidity, price-rigidity and poor regulatory and governance standards frequently cause stock returns to suffer from high-order autocorrelation, and in Islamic markets that are characterized by strong-form efficiency, as discussed earlier.

The second method used to estimate the cost of equity is a dividend capitalization model (Gordon and Shapiro, 1956), which is a more appropriate valuation method in an Islamic context as no use is made of interest rates or yields. Here, CE is again the cost of equity, where:

$$CE = \left[\frac{\textit{Dividends per share (for the next year)}}{\textit{Current Market Value of Stock}}\right] + \text{(Expected Dividends Growth Rate)}, \quad (2)$$

The retention ratio in equation (3) and return on equity in equation (4) are calculated using balance sheet data,

$$\textit{Plowback ratio} = 1 - \textit{Payout ratio} = 1 - \left[\frac{\textit{Dividends per share}}{\textit{Earnings per share}}\right], \quad (3)$$

and

$$\textit{Return on equity} = \left[\frac{\textit{Earnings per share}}{\textit{Book equity per share}}\right], \quad (4)$$

and the product used in equation (2).[8] The assumption that the owner of an equity is entitled to a stream of regular cash-flow payments remains

[8] See Brealey, Myers and Allen (2008) for a detailed analysis.

slightly at odds with the profit-and-loss sharing principle but this method represents the closest to sharia compliant finance law.

5.3 Dual listing and the transactions costs faced by potential investors

The transactions costs between the Khartoum and Abu Dhabi listings of Sudatel stock are estimated using the difference in the returns between a minimum-variance optimized portfolio, which has no constraints on the weights given to each asset, and a portfolio with equal asset weights. Where the asset weights are equal, both assets are assumed to be fully integrated and thus have the same mean and variance (Sargan, 1961). If there are no transactions costs, then the expectation is that dual-listed stocks would be held in equal proportions. Any deviation from this suggests that transactions costs between the markets listing these stocks are greater than zero.

Table 6. Bank financing in Sudan, 1998–2006

Mode of financing	1998	1999	2000	2001	2002	2003	2004	2005	2006
Murabaha	54.37%	49.12%	33.74%	39.53%	35.92%	44.64%	38.52%	43.29%	53.37%
Musharaka	21.11%	30.80%	42.88%	30.97%	27.88%	23.22%	31.99%	30.82%	20.38%
Murdaraba	5.97%	4.07%	3.51%	6.25%	4.63%	5.71%	5.74%	4.20%	5.25%
Salam	6.61%	5.02%	3.35%	4.99%	3.32%	4.80%	2.95%	2.09%	1.28%
Others*	11.94%	10.99%	16.52%	18.26%	28.26%	21.63%	20.80%	19.60%	19.72%
Total (%)	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total (millions of dollars)	20.41	285.86	393.74	559.95	787.89	1,082.83	1,706.25	3,014.43	4,861.51

Source: Compiled by the authors from the Bank of Sudan Annual Reports (1999–2006)

Note: (1) The 'others' mode of financing includes the ijara and mugawla modes.

6. Results

6.1 The cost of equity

Table 7 presents estimates of the cost of equity for Sudatel stock on both the Khartoum and Abu Dhabi Stock Exchanges, plus estimates of the cost of equity for the two rival telecommunications companies in the region: Zain and Orascom. The estimates are generated using the two methods outlined above. Both models show a decrease in the cost of equity from the secondary listing of the Sudatel stock on the Abu Dhabi exchange. The decrease in the cost of equity calculated by the Collins and Abrahamson (2006) model is in excess of 5%, with values for Khartoum and Abu Dhabi being 27.89% and 22.76% respectively.

However, owing to the short sample and consequently relatively high volatility the values are less reliable than those from the Gordon and Shapiro (1956) approach, which indicate considerable and persistent differences between the costs of equity for the two listings. The cost of equity in Abu Dhabi is lower by as much as 199.7 basis points in 2004, falling to 174.60 in 2005, and 52.60 in 2006. These results indicate that the listing in Abu Dhabi has enabled Sudatel to obtain a cheaper source of capital with which to finance its expansion into the international telecommunications markets.

Table 7. The cost of equity

Stock	Listing	Gordon and Shapiro (1956) Dividend capitalization method					Collins & Abrahamson (2006)
		2003	**2004**	**2005**	**2006**	**2007**	**2008**
Orascom	Egypt	16.42%	31.18%	36.25%	-- --	33.61%	20.06%
Zain (MTC)	Kuwait	12.23%	10.34%	-- --	13.58%	10.46%	-- --
Sudatel	Khartoum	24.89%	29.15%	26.46%	55.33%	13.07%	27.89%
Sudatel	Abu Dhabi	24.89%	9.18%	9.00%	50.07%	13.36%	22.76%

Note: (1) The costs of equity for 2003–2007 were estimated using the Gordon and Shapiro (1956) method.
(2) The costs of equity for 2008 were estimated at May 2008 using the Collins & Abrahamson (2006) method, based on annualized risk premiums and risk-free rate of return (Saudi 4-week T-Bill yield).
(3) The dividend capitalization method assumes constant (mean) rate of growth rate of dividends of 6%
(4) The Collins & Abrahamson (2006) measure assumes a world market risk premium over the Saudi risk-free rate of 4.43%.

It is particularly instructive to compare the costs of equity of Sudatel with those of its two main regional competitors, Zain and Orascom. Zain has a primary listing on the Kuwait Stock Exchange, the largest MENA bourse, and has a very low cost of equity ranging from 12.23% in 2003 to 10.46% in 2007. The picture is quite different for Orascom, listed on the Egypt exchange, where the cost of equity has actually increased from 16.42% in 2003 to 33.61% in 2007. This significantly higher value explains the recent decision by the company to make a secondary listing of a Global Depository Receipt on the London Stock Exchange. The differential costs of capital may also explain, at least in part, the different expansion strategies followed by the three firms. Zain has the lowest cost of capital and has achieved a dominant position across Africa and the Middle East. In contrast, the expansion of both Orascom, which has focused primarily on North African markets,

and Sudatel has been limited by their ability to raise equity capital at competitive rates (Al Zawya, 2008).

Other differences also impact upon the cost of equity financing. Both Zain and Orascom adhere to internationally accepted corporate governance regimes with two-tier boards (executive and non-executive directors), a split between the roles of the chairman and the chief executive officer (CEO), and the presence of an independent audit committee. Information disclosure is timely and in accordance with OECD corporate governance guidelines. This is not the case with Sudatel, which operates with a single board, and little to differentiate between directors' roles or the positions of chairman and CEO. The board is composed of stakeholders, with the government, the Bank of Sudan and two Sudanese public investment firms accounting for seven of the twelve directors, following the principles implied by profit-and-loss sharing and its influence on governance. A further two directorships are held by Middle Eastern affiliate firms.

6.2 Dual Listing and Transactions Costs

The Sudatel stock returns on both the Khartoum and the Abu Dhabi Exchanges were highly volatile over the period, with the returns showing standard deviations of 16.32% and 13.32% respectively – see table 8. Comparisons are provided with S&P market indices for other regional markets. The mean return for the Khartoum listing (1.82%) is substantially lower than that of the Abu Dhabi listing (2.29%), hence the former listing offers investors a poorer trade-off between risk and return than the latter. Neither asset compares favourably to the mean risk-return characteristics of the regional market indices of Saudi Arabia, Bahrain, Egypt and Oman, and all contrast poorly to the MSCI World index. This provides some indication of the degree of segmentation apparent between the Sudanese market, represented by Sudatel, and the MENA region. The returns series also exhibit high levels of autocorrelation[9] implying that these series are not weak-form efficient which is a significant deviation from the implicit assumption of strong-form efficiency and full informational revelation of prices within a fully sharia compliant market. This is a common feature of emerging markets due to price rigidity caused by illiquidity (Bekaert and Harvey, 1995).

The correlations in Table 8 between both Sudatel listed assets and the other regional markets are very low and often negative. However, the

[9] Autocorrelation results available from authors upon request

Abu Dhabi asset exhibits larger negative correlations than its Khartoum counterpart suggesting substantial opportunities for risk diversification. Consequently, this is a more attractive asset for risk diversification in investor portfolios and increases the likelihood that Sudatel will be able to access additional finance.

Table 8. Risk-return tradeoffs and correlations

Stock (market)	Sudatel (Abu Dhabi)	Sudatel (Khartoum)	S&P Saudi Arabia	S&P Bahrain	S&P Egypt	S&P Oman	MSCI World
Descriptive statistics							
Mean	2.29%	1.82%	2.60%	2.34%	5.12%	3.25%	1.36%
Std. Dev.	13.32%	16.32%	9.53%	4.00%	9.10%	4.99%	2.72%
Correlations							
Sudatel (Abu Dhabi)	100.00%	-- --	-- --	-- --	-- --	-- --	-- --
Sudatel (Khartoum)	34.11%	100.00%	-- --	-- --	-- --	-- --	-- --
S&P Saudi Arabia	- 15.05%	- 2.76%	100.00%	-- --	-- --	-- --	-- --
S&P Bahrain	- 9.02%	3.42%	22.98%	100.00%	-- --	-- --	-- --
S&P Egypt	- 5.47%	7.45%	23.17%	38.74%	100.00%	-- --	-- --
S&P Oman	- 27.68%	- 14.94%	39.99%	27.18%	28.82%	100.00%	-- --
MSCI World	0.65%	1.70%	- 2.09%	- 6.15%	11.28%	4.05%	100.00%

Source: Compiled by the authors fom Datastream. Sudatel (Khartoum) are from the AMF and Sudatel (Abu Dhabi) are from Bloomberg.

Note: (1) All data reported in SAR end of period values
(2) The correlations are between the total returns indices for each respective market.
(3) The S&P Saudi Arabia, Egypt, Oman and Bahrain indices, as well as the MSCI World index, are sourced from Datastream.
(4) The Sudatel Abu Dhabi and Khartoum series are constructed in accordance with S&P index methodology using data obtained from the Arab Monetary Fund.

Estimates of the costs faced by investors from holding the Sudatel Khartoum asset in preference to the Abu Dhabi asset are estimated in table 9. These estimates show that the transactions costs facing investors in Sudatel between the Khartoum and Abu Dhabi exchanges were both high and pervasive. The annualized average premium measured in basis points ranged from 49.51 in 2004, to 42.64 in 2005, to 88.50 in 2006, and to value of 56.19 in 2008. These results are in line with the earlier findings concerning cost of equity between the two listings and reflect the better institutional environment in Abu Dhabi, which reduces informational asymmetries between the firm and its investors, as well as access to a wider and more diversified pool of investors. The considerable premium and then gradual reduction over time is partly the result of the improvement in standards of national accounting and auditing in Sudan,

which had not only been misaligned with world standards but also poorly applied in practice, a common feature of developing economy financial markets. In addition, many investors in the region have gained a greater understanding of the valuation and performance metrics and are able to reflect this information in terms of demand and prices.

Table 9. Sudatel Listings on the Khartoum and Abu Dhabi Stock Exchanges

	2004	2005	2006	2007	2008
Transactions cost premium(basis points): Sudatel Abu Dhabi versus Khartoum	49.51	42.64	88.50	11.14	56.19

Note: All data are in SAR end of period values, and all strategies are evaluated in Saudi Rials

These results indicate that equity investment in Sudatel is unlikely to follow the traditional pattern of portfolio investment elsewhere. While the firm has achieved a lower cost of equity by listing in Abu Dhabi and gained access to international investors from the MENA region the listing in Bahrain suggests that large individual blockholders have a particularly important role to play. Despite the increased levels of market regulation, stricter disclosure requirements and higher standards of auditing and accounting that have contributed to the lower cost of equity for Abu Dhabi listed stock compared to that in Khartoum, the company is more likely to seek investments from large blockholders. Equity investment from large individual blockholders would reduce concerns about lack of regulation, particularly with regard to the protection of minority shareholders, whose presence could be deemed to be speculative and thus contrary to Islamic sharia principles. Further, the presence of large blockholders and controlling groups would satisfy the profit-and-loss sharing principle of Islamic sharia investment where preference is given to those parties involved in the active management and risk-sharing of firms.

7. Policy implications

A critical factor in the expansion of TNCs from emerging markets is the ability to access cost-effective finance to facilitate entry into competitive product markets. Firms that are sufficiently large and well-capitalized are able to diversify their financing strategies through a form of institutional arbitrage between markets. This is especially important for firms originating from emerging countries in which domestic financial markets are often highly segmented from world capital markets,

with associated considerably higher costs of equity. Those firms which are able to afford the additional listing and disclosure costs in markets with stronger regulation and regulatory enforcement are able to mitigate the effects of information asymmetry that discourages investors and achieve a lower cost of equity and capital. However, those firms that seek to fulfil their financing requirements in compliance with Islamic sharia directives are faced with an additional constraint concerning the financing location and products available. The very institutional design of markets that are fully compliant to Islamic sharia directives render them distinct from those markets that offer either a combination of Western and Islamic instruments or offer solely Western financing solutions. This segmentation means firms are only able to access a small pool of investors, with little prospect for diversification and consequently a higher cost of equity and capital. The high costs of equity reduce the profitability of potential development projects and reduces the ability of the firm to compete in international product markets.

Mindful of these issues, there is considerable scope for policy debate amongst MENA market regulators concerning optimal institutional design and the benefits for indigenous firms seeking to raise capital from markets that are either fully sharia compliant or dualistic in their nature. Many MENA markets operate a dualistic approach in trading Western and Islamic financial products. This enables firms to benefit from accessing a wider and more cost effective pool of capital while enabling organizations to retain compliance with Islamic sharia financing principles. Markets that are fully sharia compliant are very reliant on all participants having a high level of Islamic education and social justice in order to comply with prescriptions relating to alleviation of moral hazard and strong-form informational efficiency. This way both borrowers and investors are able to engage in a partnership based on the profit-and-loss sharing principle of Islamic Finance.

8. Conclusions

The rapid overseas expansion of Sudatel into telecommunications markets in the Maghreb region and West Africa is particularly interesting as the company is a prominent example of an TNC that is not only from an emerging market but is also one that adheres to sharia compliant financing principles. The main drivers for this expansion have been the recent deregulation of the telecommunications sector across Africa and the Middle East, the privatization of former State-owned operators, and the liberalization of economies in many countries that has allowed foreign ownership and investment.

The Khartoum Stock Exchange is the primary source of equity finance for domestic Sudanese firms, but the high costs of capital leads to a lack of competitiveness, particularly for firms that can list on foreign markets where there are stronger institutions. In contrast, the Abu Dhabi and Bahrain Exchanges attract a considerably higher proportion of Arab and foreign investors both regionally and globally. The share of foreign traded value in Bahrain increased from 35% in 2003 to 48% in 2007, although this exchange lacks the size and institutional infrastructure of the Abu Dhabi market. The capitalization and turnover ratios clearly reflect the difference, with capitalization on the Abu Dhabi market thirty times that of Bahrain and turnover over ten times in 2007.

A major challenge of Sudatel's regional expansion has been access to low cost capital that is sharia compliant. Since privatization in 1997, the company's ownership has been diversified and it is listed on the Khartoum Stock Exchange. Additional listings in Abu Dhabi and Bahrain have followed, where the former was designed to attract a wider audience of Arab investors and the latter directed towards high net-worth individual investors and/or blockholders. As a result of the cross-listing in Abu Dhabi, Sudatel escaped from the liquidity constraints in the home market and thereby achieved a reduction in the cost of capital that has made profitable expansion overseas a reasonable prospect.

In summary, Sudatel is likely to continue to source finance for international expansion from the regional financial markets in the Middle East as these markets offer sharia compliant products and cheaper sources of capital than are available in Sudan. However, markets that are completely sharia compliant are likely to be more segmented due to the global dominance of Western financial principles. In addition, there are also inefficiencies characteristic of emerging markets, such as institutional infrastructure, particularly regulation, and international standards of corporate governance. Consequently, Sudatel is most likely to fund future growth and expansion by accessing finance Islamic sharia compliant products offered by Western-style institutions, whether they are banking or securities companies in the MENA region markets.

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EU enlargement and foreign direct investment into transition economies revisited *

Ichiro Iwasaki and Keiko Suganuma **

It is highly likely that EU accession negotiation had a large influence on foreign direct investment (FDI) into the Central and Eastern European countries involved therein. We found that as the membership talks progressed, the effect of attracting FDI to candidate states tended to increase gradually. It also became clear that EU member candidate countries experienced an adverse impact on FDI at the very final phase of the negotiation. This might have been due to the substantial revision of conventional FDI incentives, which most likely was the price paid for becoming new EU members. The relationship between the progress in the EU enlargement process and FDI received by the candidate countries was not a simple positive relationship, but followed a reverse J-shaped curve.

JEL classification numbers: F21, F23, F59, O52, P33.

Keywords: EU enlargement, foreign direct investment, transition economies

1. Introduction

In January 2007, Bulgaria and Romania joined the European Union (EU), and the fifth enlargement of the EU was completed. A unified market boasting a total population of 491 million and a GDP of €10.9 trillion was established, surpassing that of the United States. It is considered that this grand political process, which spanned from the end of the Cold War to 2007, achieved its major goal, i.e. the establishment of a new broad European order embracing the former communist bloc with a relatively successful outcome.

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The EU enlargement brought economic benefits to candidate countries at the negotiation stage already prior to accession. The inflows of foreign direct investment (FDI) is a typical example. As shown in table 1, the cumulative FDI inflows into 21 Central and Eastern European countries (CEECs) and former Soviet states for the 17-year period from 1989 to 2005 reached a total of $375 billion, of which, 70.1 per cent ($263 billion) was concentrated in the ten new acceding countries. The total investment volume per capita of these ten new EU countries and 11 other non-EU countries stood at $2,571 and $482, respectively, the disparity being more than five-fold. This difference is statistically significant (*t* test: t=3.931, p=0.001; Wilcoxon rank-sum test: Z=3.380, p=0.001). As many researchers have emphasized, for former socialist countries that are trying to come out of the planned economy system, FDI from developed countries is not only a source of finance but also a powerful driving force in systemic transformation into a modern market economy (Estrin et al., 2000; Marinova and Marinov, 2003; Stephan, 2006; Dallago and Iwasaki, 2007).

Table 1. Regional distribution of FDI in 21 transition economies, 1989-2005

	Cumulative FDI inflow (millions of dollars)	Cumulative FDI inflow per capita (millions of dollars)	c.f. Total population (millions) *
Poland	75'733	1'985	38.2
Russian Federation	65'567	459	142.8
The Czech Republic	56'529	5'514	10.3
Hungary	56'294	5'587	10.1
Romania	23'977	1'110	21.6
Ukraine	16'236	348	46.7
Slovakia	14'248	2'644	5.4
Bulgaria	12'790	1'657	7.7
Croatia	12'538	2'822	4.4
Estonia	7'998	5'948	1.3
Lithuania	5'581	1'640	3.4
Serbia and Montenegro	5'429	662	8.2
Slovenia	5'193	2'592	2.0
Latvia	4'497	1'960	2.3
Georgia	2'383	530	4.5
Belarus	2'258	230	9.8
Bosnia and Herzegovina	2'058	528	3.9
Albania	1'680	536	3.1
Armenia	1'455	455	3.2
The former Yugoslav Republic of Macedonia	1'282	629	2.0
Republic of Moldova	1'145	318	3.6
Total of 21 countries	374'871	1'120	334.6
Ten new EU accession countries	262'840	2'571	102.2
Remaining 11 countries	112'031	482	232.3

Source: Authors' calculation based on public data of UNCTAD, the UN Statistic Division, EUROSTAT, and the Interstate Statistical Committee of the CIS.

Note: * Late 2005 or early 2006.

The close relationship between the fifth EU enlargement and FDI is shown in table 1. However, this is not a rigorous proof. As the traditional theory of international production teaches us, FDI is influenced by a variety of factors, including market proximity and country size. In this connection, some studies that has empirically examined the determinants of FDI into CEECs and former Soviet states conclude that EU accession talks have had a significant impact on FDI into candidate countries even after controlling for other underlying factors. As we will discuss later, however, the existing studies have a problem in the empirical methodology for estimating the FDI-promoting effect of EU Eastern enlargement. The objective of this paper is to re-examine the impact of the EU Eastern enlargement on FDI by studying the accession negotiation involving the EU and transition countries more closely and using an analytical method that can capture historical facts more realistically.

We found that, as the membership talks progressed, the effect of attracting FDI to candidate states tended to increase gradually. The empirical evidence further suggests that EU member candidate countries experienced an adverse impact on FDI at the very final phase of the political negotiation. This might have been due to the substantial revision of conventional FDI incentives, which most likely was the price paid for becoming new EU members. The relationship between the progress in the EU enlargement process and FDI received by the candidate countries was not a simple positive relationship, but followed a reverse J-shaped curve.

The remainder of this article is organized as follows. Section 2 traces the political phases of the EU enlargement process from the collapse of the Communist bloc up to the 2007 accession of Bulgaria and Romania. Section 3 theoretically examines the impact of the EU accession negotiation talks on promoting FDI. Section 4 empirically verifies the theoretical hypothesis, and section 5 concludes the paper.

2. Political journey of EU Eastern enlargement[1]

In empirically re-examining the impact of EU Eastern enlargement on FDI into the CEECs, the following points are specially noted. First, the

[1] The content of this section is based on Ott and Inglis (2002), public information and data released by the EU (http://ec.europa.eu/) and the Foreign Ministry of Japan (http://www.mofa.go.jp/mofaj/area/eu/index.html), and reports from the *Financial Times* (FT), *Népszabadság*, an influential daily in Hungary, and *Nihon Keizai Shimbun* (NKS), a Japanese economic newspaper, unless otherwise noted.

process of EU membership negotiation talks entailed four consecutive steps: (a) conclusion of the Association Agreement; (b) accession application; (c) accession negotiation; and (d) closure of negotiation and accession. Second, the timing involved in reaching these stages and the duration of these stages varied among member candidate countries. It is possible that the degree of impact that affects the decision-making of corporations and investors regarding FDI to EU member candidate countries differed considerably depending on the accession stage the candidates are in. Hence, we examine how these two aspects of EU Eastern enlargement may affect transnational corporations (TNCs) and other potential investors.

2.1 Association agreement conclusion stage

The era of ideological division in Europe ended with the fall of the Berlin Wall in November 1989. Subsequently a momentum for regional integration based on democracy and market principles was generated. The CEECs made clear their expectation for the enlargement of the EU towards the East. The fact that, right after the collapse of the Berlin Wall, the Governments of Hungary and Poland made approaches for acceding to the EFTA as a preparation for joining the EU in the near future was a direct manifestation of their anticipation.

The EU – then EC – side responded promptly to the enthusiasm of Eastern countries. In August 1990, the EC Commission decided to steer towards starting sequential negotiations for the conclusion of the "European Agreement" with countries in which democratization and economic reform were underway. The agreement stipulated periodic political talks between the EU and the countries involved; the creation of a free-trade zone ensuring the free flows of people, goods and capital; various aids to establish a market economy, and an array of financial and technical support. As Mardas (2005) pointed out, this association agreement was the first step toward providing a legal framework for EU Eastern enlargement. The number of candidate countries in the accession negotiation increased as years went by: at the end of 1991, Czechoslovakia, Hungary, and Poland; in the spring of 1993, Bulgaria and Romania; in June 1995, three of the former Soviet Baltic states; and, in June 1996, Slovenia concluded the European Agreement.[2] Since this agreement required the amendment and improvement of domestic

[2] In addition, after the break-up of the federal state, the Czech Republic and Slovakia again signed the European Agreement with the EU in October 1993. However, this was a mere formality.

laws pertaining to trade and humanitarian/human rights, the reaction of CEEC Governments towards legislative ratification and enactment drew domestic and international attention as the first important test for joining an integrated Europe.

2.2 Accession application stage

In 1993, the Maastricht Treaty, which contains the basic tenets of EU governance, came into effect. The same year, the Copenhagen European Council demonstrated diplomatic commitment to the formal EU membership of CEECs and, at the same time, came up with three criteria for membership (the Copenhagen criteria).[3] This political measure constituted a huge step forward for EU Eastern enlargement in the sense that the process rolled into a phase in which the methods and roadmaps were being made more concrete (Tanaka, 2002). Among CEECs, countries that achieved the provisions laid down in the association agreement began to apply one after another in response to the decision made by the Copenhagen European Council. This was the second step towards obtaining EU membership. The first membership applications were made by Hungary and Poland in 1994. One year later, in 1995, Bulgaria, Romania, Slovakia, and the three Baltic states applied, and, in 1996, the Czech Republic and Slovenia applied to the EU presidency holder at that time.

In 1989, Western enterprises and investors were hesitant to invest in the former socialist region, arguing that "though East Germany could be an investment target, the rest of Eastern Europe entailed too much of a risk".[4] However, it is clear from the media reports at the time that this investor sentiment improved throughout the first half of the 1990s, when the European Agreement was concluded and a spate of membership applications ensued. Yet, at this point, it was difficult to accurately predict which CEECs were going to become new EU members and at what date. This fact clouded the decision-making of Western enterprises and investors. Several factors were considered as promising when making an investment decision. First, the fact that Western European public opinion regarding EU enlargement was

[3] These accession criteria are (a) the stability of institutions guaranteeing democracy, the rule of law, human rights, and respect for and protection of minorities; (b) the existence of a functioning market economy, as well as the capacity to cope with competitive pressure and market force within the Union; and (c) the ability to take on the obligations of membership, including adherence to the aims of political, economic, and monetary union.

[4] NKS, December 12, 1989.

relatively favourable at the time.[5] Second, the Russian political leader expressed positive support toward CEECs, including his own country, obtaining EU membership. Third, EU leaders and officials adopted joint declarations and chairperson's summaries committing to CEECs gaining membership at the Essen European Council in December 1994 and at the Cannes European Council in June 1995.

On the other hand, there was a great deal of concern involving negative information. First, differences emerged regarding the EU enlargement among member countries, especially, a serious disagreement between Germany and France; Germany was very enthusiastic about including former Communist states, whereas France put emphasis on deepening EU integration. Second, Cohesion Countries were politically apprehensive because of the prospect that they would suffer a reduction in funding, such as that of Common Agricultural Policy (CAP) as a result of a rise in membership, as well as the reduction of seats at the European Parliament and voting rights at the European Council (Baldwin, 1995). Third, there was uncertainty regarding consensus-building at the Intergovernmental Conference (IGC) held in 1996 to discuss the issues concerning amendments to basic EU law.

2.3 Accession negotiation stage

After four months of the 1996 IGC meetings, this uncertainty regarding Eastern enlargement diminished considerably when the IGC reached a basic agreement on the amendment to the Maastricht Treaty. In July 1997, the European Commission adopted the "Agenda 2000" at a Strasbourg general meeting. They approved a first group of six accession candidate countries: Cyprus, which had already been approved for membership negotiations, the Czech Republic, Hungary, Poland, Estonia and Slovenia. Moreover, they announced a plan whereby official negotiations with these countries were to start by the beginning of 1998 and the accession was to be completed by 2002.

In March 1998, the membership negotiations involving the five CEECs (Luxembourg group) started in concert as planned. In addition, in parallel with this first candidate group, the five other countries proceeded with the preliminary negotiation with the European Commission; they were finally recognized at the Helsinki European Council in December

[5] For example, according to the joint poll conducted by eight major European newspapers in May 1994, 50 per cent of citizens answered "favourably" to the accession of the Czech Republic, Hungary, Poland, and Slovakia, which was far higher than the 30 per cent who answered "unfavourably".

1999 as the second candidate group (Helsinki group) and started official talks in February 2000. At that time, it was considered that accession for the latter group would take place around 2003.

By this time, the Eastern enlargement was practically established as a determinate course of the EU, and, thus, foreign investors came to have considerable confidence in its realization. However, even at this point, a number of problems that could have derailed the early realization of EU Eastern enlargement remained. First of all, there were considerable political difficulties at the IGC held in 2000 to discuss the revision of basic EU law, which was essential for the establishment of the EU-25 system. Furthermore, the ratification of the Nice Treaty encountered difficulties in a number of member countries. When the Irish national referendum held in June 2001 voted against the ratification of the Nice Treaty (with 54 per cent voting "no"), the EU enlargement process stalled. Second, the support for Eastern enlargement among the public in both EU member states and applicant states mostly fell short of majority. Third, there were additional factors exerting a negative impact on EU enlargement. One was a more cautious approach emerging among member states, exemplified by the Berlusconi administration, when clear opposition to the Eastern enlargement was expressed, Another factor was that the former Communist parties were rising in popularity in transition countries.

These political obstacles did not prove to be a final blow for a number of reasons. First, Irish voters, in their second national referendum, supported the ratification of the Nice Treaty. Second, to address the concerns among EU citizens, new policies were introduced, for instance, to limit the migration from new member states for a certain period of time after the enlargement. Third, a consensus was reached in order to prevent the postponement of the Eastern enlargement, which resulted in diplomatic negotiations and political compromises behind closed doors at various levels (i.e., EU leaders, foreign ministers, and the European Commission). Nevertheless, it is possible that the foregoing obstacles did pose a certain negative psychological impact in the minds of enterprises and investors throughout the negotiation process.

For TNCs and other foreign investors considering the expansion of their businesses in EU candidate countries, the issues that were even more serious than those reported above regarding the EU Eastern enlargement in general involved the following two points. First, the accession timetable was being delayed daily due to the harder-than-expected admission process of the *Acqui communautaire*, which

constituted the central project of the accession negotiation. Second, a prospect that the order of accession would have to change emerged as differences in negotiation processes grew considerably among candidate countries. Indeed, even the Luxembourg group of the first accession candidate countries, contrary to the optimistic expectations in 1998, had no hope in concluding negotiations by late 2001, already four years into the process. In addition, according to the mid-term report on accession negotiations released in August 2001, of 31 clauses in the *Acqui communautaire*, Hungary headed the list, having completed 22 clauses with the European Commission, and the Czech Republic, Estonia, Slovakia, and Slovenia had completed 19 to 20 clauses, while Poland was off to a slow start and had completed only 16 clauses. Moreover, Bulgaria and Romania were in a situation in which they could not even negotiate many clauses because the adjustment of its internal system was not moving forward in many important areas, such as the financial system, agriculture and free movement of people.

2.4 Closure of negotiation and accession stage

Given these circumstances, the EU made the decision to reshuffle the membership candidate groups. The Laeken European Council held in December 2001 moved Latvia, Lithuania and Slovakia from the Helsinki group to the first group and indicated the possibility of affiliating all ten countries at once with the EU in 2004. This "Big Bang" style enlargement policy was confirmed when the Copenhagen European Council held in December 2002 agreed to end the accession negotiation of the ten countries. In the meantime, the policy efforts made by the Government of Poland to promote accession talks were remarkable. However, it is also true that the decision by the EU side played a considerable role in the realization of the Big Bang. EU leaders were of the opinion that it was politically inappropriate to postpone the accession of Poland. Clear evidence of this is in the fact that transition measures to allow a grace period in fulfilling EU standards were included in a considerable number of negotiation clauses.

The last political project that was left for the countries that had reached the final negotiation stage was to domestically ratify the accession treaty signed in Athens in April 2003. This hurdle was cleared without problems in all countries as a large majority voted affirmative in the national referendum.[6] In addition, the conclusion of accession

[6] However, voter turnout itself was less than expected: Hungary, 45.6 per cent; Slovakia, 51.7 per cent; the Czech Republic, 54.9 per cent; and Poland, 56.2 per cent. This voting pattern of CEEC citizens probably reflected their ambivalent national

negotiations for Bulgaria and Romania, which had been left behind in the accession race, was approved at the European Council held in Brussels in 2004. The accession treaties that both countries had signed were ratified in the European Parliament in May 2006.

The Eastern enlargement triggered by the collapse of the Communist regimes in 1989 finally accomplished its political process after 19 years. Facts such as increased production by TNCs' affiliates in new member states and an increase in FDI in countries surrounding the new member states indicate that the business sector also welcomed this historical landmark event.

In addition to these ten countries that had become EU member states, Croatia and the former Yugoslav Republic of Macedonia officially applied to join the single market during the fifth enlargement process Croatia started accession negotiations with the European Commission in October 2005. At that time, the Government of Croatia was aiming to become a member in 2007, along with Bulgaria and Romania; however, that turned out not to be the case, and they are still waiting for the next opportunity. The former Yugoslav Republic of Macedonia concluded the Stabilization and Association Agreement in April 2001, prior to Croatia, and applied for membership in March 2004. A year later, in December 2005, the former Yugoslav Republic of Macedonia was given candidate status at the Brussels European Council. However, even by the end of 2009, accession negotiations had not yet started. By June 2007, the Brussels European Council had made a breakthrough in the EU reform process that led to the ratification of the new treaty. Nonetheless, the new EU framework has come into force only from December 2009, and there are many internal issues within the EU to resolve before further Eastern enlargement. Hence, the accession of Croatia and the former Yugoslav Republic of Macedonia may be delayed until 2012. In fact, in a report adopted in October 2009, the European Commission refrained from committing firmly to the further enlargement towards the countries of the Western Balkans and Turkey, stating that "(these countries) have still substantial work ahead in meeting the established criteria and conditions".[7]

In this section, we have reviewed the passage of the fifth EU enlargement at length. The investors make a decision after thorough

sentiment toward EU accession (e.g. see the press report of the *Népszabadság*, 14 April, 2003).

[7] Commission of the European Communities, Enlargement Strategy and Main Challenges 2009-2010: Communication from the Commission to the European Parliament and the Council (COM (2009) 533), Brussels, 14 October 2009.

research and comparison of political and economic situations in the alternative investment target countries. The feasibility and timing of EU accession are crucial reference points for the CEECs. Thus, it is highly likely that a country's political process in the EU Eastern enlargement process closely relates to FDI going to the Central and Eastern region. Here, we hypothesize that official participation in EU accession talks and completion of advanced stages in the accession process had economic significance and constituted a statistically positive and significant impact on FDI to the states in question. From the next section on, we will theoretically and empirically verify this hypothesis.

3. EU accession talks as a factor promoting FDI

Essentially, there are two theoretical premises for EU Eastern enlargement that are considered as promoting factors of FDI into the candidate countries in Central and Eastern Europe. One premise is that trade liberalization with the EU market in anticipation of future accessions would stimulated investment in the candidate countries, including FDI. The other is that accession talks function as a "political anchor" that would discipline and increase the transparency of political decision-making and institution-building, thereby reducing investment risks (Baldwin et al., 1997).

Trade liberalization with the EU market began as soon as the European Agreement was signed, which was the first step of EU accession negotiations. The EU and ten CEECs were mutually bound to remove tariffs and non-tariff barriers on imports gradually in accordance with the schedule designed for each country as laid down in the Agreement.[8] The Copenhagen European Council, in June 1993, decided to renegotiate and conclude an interim agreement with countries that had signed the Agreement in order to accelerate the process. As a result, immediately after the European Agreement or the interim agreement came into effect, EU member states eliminated all custom duties and quotas on industrial imports (except for steel and iron and textiles) from the countries entering the agreement. In addition, the CEECs introduced a relaxation on EU trade regulations ahead of the agreed schedule. In fact, those countries that had signed the agreement gradually reduced their tariffs on almost all industrial goods manufactured in the regional

[8] The grace period for transition to the free trade zone as ruled by the European Agreement was ten years for Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovakia; six years for Lithuania and Slovenia; and four years for Latvia. The only country that was not given such a grace period was Estonia (Koutrakos, 2002).

market down to 0 per cent by 1997. In addition, virtually all import taxes on sensitive products were abolished by 2002 (Koutrakos, 2002).

The foregoing measures, which aimed at establishing an early introduction of the free-trade zone, greatly enhanced trade between the EU and the ten CEECs. Indeed, the share of EEC and EC member states in the total amount of exports (imports) of Hungary, Poland and Bulgaria in 1989 were 24.7(28.5) per cent, 32.1(33.8) per cent and 19.5(35.0) per cent, respectively, but these figures reached 71.2(62.4) per cent, 64.2(63.8) per cent and 44.9(41.9) per cent, respectively, in 1997. The trade volume itself increased sharply as well. For example, the amount of exports (imports) of Hungary during the same period increased in dollar terms by a factor of 1.98(2.41), whereas trade with EU15 grew by a remarkable factor of 5.70 (5.21).[9] This trend can similarly be observed in other accession candidate countries (Sugiura, 2006).

The EU accession talks were effective in reducing the investment risk in candidate countries in various ways. For example, in the legal realm, the domestic legislation, including laws pertaining to ownership, employment practice, business organization and corporate taxes, came closer to the EU standard. As Bevan et al. (2004) contend, institutional development significantly influenced capital inflow into the post-Communist states. With regard to micro-level policy, in addition to the relaxation of regulation on trade-tariff policy, predictability and transparency were enhanced by introducing competition and industrial protection policies. In addition, free access to financial and capital markets was assured, and corruption and graft regulations were strengthened. Regarding macro-level policy, the convertibility of home currency was established, inflation was controlled, and fiscal discipline was strengthened. All these measures, together with policy efforts by the candidate countries in their efforts to meet the Copenhagen criteria and to accept the *Acqui,* facilitated the monitoring activities by the European Commission in a fast and steady manner. This, indeed, made TNCs and investors confident. Furthermore, above all, the political stability in host countries – the issue that foreign investors are most sensitive about – was secured. In this sense, the notion of EU membership as a national goal has worked highly effectively.

The degree of reduction in the perceived investment risk brought on by EU Eastern enlargement can be inferred from a third party's objective evaluation. According to Euromoney, the country risk ranking

[9] Calculation by the authors based on Nishimura (2000) and the Hungarian statistical yearbook (KSH) for each year.

of the ten EU candidate countries was on average 63.37 between 1992 and 2004. This figure is far better that the ranking of other CEECs and former Soviet states, which was, on average, 129.59. This difference is statistically significant (Wilcoxon Z=12.432, p=0.000). Moreover, the ranking improvement during the same period for the latter group stands at an average of 14.5, whereas the former group averaged 36.2; the significant level of this difference is very high as well (t=2.331, p=0.015; Wilcoxon Z=2.253, p=0.024). These facts demonstrate that the low level of country risk and the speed of risk reduction for candidate countries were remarkable achievements vis-à-vis other transition countries.

Trade expansion with the EU market and drop in investment risks in candidate countries affected both domestic and foreign investors. However, when reflecting on the economic situation of the post-communist candidate countries, it is easy to imagine that it was mainly foreign capital that was able to respond to the rising capital demand. A series of problems characteristic to a transition economy, such as an undeveloped banking system and capital market, a fragile management base of former socialist enterprises, deep informational asymmetries between domestic investors and corporate managers, under-developed risk management techniques, and the lack of investment experience based on market principles, made the supply of domestic capital extremely limited. Direct manifestations of the these problems included the following: (a) investment undertaken by companies in CEECs are mainly financed with internal reserves; (b) a very serious credit crunch of the banking system; and (c) a passive attitude of domestic banks and investors toward long-term corporate financing (Berglof and Bolton, 2002; Sugiura, 2007).

As if to exploit the gap while the domestic companies and financial institutions were at a standstill, powerful European, Japanese and United States corporations engaged in active investment. For instance, in Hungary, TNCs accounted for an average of 49.7 per cent of corporate investment and 72.3 per cent of product exports from 1995 to 2003 (Iwasaki, 2007). It would not be an exaggeration to say that the capital shortage in the CEECs was covered by FDI from developed countries.

In addition to the market-inducing investment-promoting effects reported above, it should not be forgotten that there was a policy that was more direct and promotes foreign capital as part of EU accession talks. The financial and technical support that the EU side had pledged in the European Agreement and Agenda 2000 was carried out within

frameworks such as structural and cohesion funds, the Poland and Hungary Assistance for Economic Restructuring Program (PHARE), the Special Accession Program for Agriculture and Rural Development (SAPARD) and the Instrument for Structural Policies for Pre-Accession (ISPA). It has been argued that this support contributed to cost reduction in the establishment and management of TNCs' local affiliates by investing in social capital improvement, including transportation, communication, power transmission, water supply, sewage systems, land improvement and environmental infrastructure (Breuss et al., 2001; Iwasaki and Sato, 2004; Iwasaki, 2007).

It is thus highly probable that the Eastern enlargement of the EU induced indirect and direct effects of promoting FDI to candidate countries. Surprisingly, there have been few studies focusing on this point, although a great deal of empirical literature has taken into consideration the determinants of FDI in CEECs and former Soviet countries. Eight such earlier studies are listed in table 2. The most pioneering work is Brenton et al. (1999). They used a gravity model to assess the impact of being an EU candidate country on cumulative FDI in host countries up to the mid-1990s and confirmed that (a) the first candidate country group enjoyed significantly more FDI than the second group; and (b) EU candidate countries in general received a larger amount of FDI than the CIS states. Bevan and Estrin (2000) is an empirical study that paid even greater attention to the FDI-promoting effect of the EU accession process. They focused on the announcement effect of the "pre-accession strategy" adopted at the Essen European Council in December 1994 and "Agenda 2000" put forward by the European Commission in 1997. Their panel data analysis shows that the impact of Agenda 2000 on FDI has a positive sign and it is significant at the 1 per cent level for countries approved as first accession candidates.

The remaining six studies can be divided into two categories from a methodological point of view. The first group focused on important decisions made by the European Council and European Commission regarding the Eastern enlargement and examined their influence upon FDI. Suzuki and Suganuma (2008) falls under this category. The second category constitutes empirical studies that focused on whether the countries analysed were EU accession candidate countries or not; Assenov (2003) and Suganuma (2006) are included in this category. Bevan and Estrin (2004), Egger and Pfaffermayr (2004b), and Clausing and Dorobantu (2005) developed empirical analysis using the two methodologies noted above.

Table 2. List of studies that examine the impact of EU Eastern enlargement on FDI into transition economies

Study	Analysis period	Target countries		Data type (estimate methods)	Empirical methods and estimation results of the FDI-promoting effect of EU Eastern enlargement		Other statictically significant FDI determinants
		Home countries	Host countries		Empirical methods	Estimation results	
Brenton et al. (1999)	Mid-1990s	12 developed countries (9 European countries, Japan, Rep. of Korea, United States).	50 countries (including 8 CEECs and former Soviet states).	Cross section (OLS).	First-round EU candidate dummy (CEE1st) (1: the Czech republic, Hungary, Poland and Slovenia); second-round EU candidate dummy (CEE2nd) (1: Bulgaria, Romania, and Slovakia).	The sign and statistical significance of the coefficient differ depending on the home country, but, generally, if the coefficient is positive, CEE1st>CEE2nd, and, if it is negative, CEE1st<CEE2nd.	GNP (+); total population (+); distance between capital cities (-); economic freedom index (-); CIS country dummy (-).
Bevan and Estrin (2000)	1994-1998	18 developed countries (15 European countries, Japan, Rep. of Korea, United States).	11 CEECs and former Soviet states.	Panel data (random effects).	The Essen European Council announcement effect dummy (ESSEN) (1: 1995 onward); "Agenda 2000" first-wave candidate country dummy (AGEND1) (1: 1997 onward for corresponding country); second-wave candidate country dummy (AGEND2) (1: 1997 onward for corresponding country).	AGEND1 is positive and significant at the 1% level. Other variables are insignificant.	GDP per capita (+); labor cost (-); distance between capital cities (-); wellness of business environment (+); proximity to EU market (distance from Germany) (+); credit rating of host country (+).
Assenov (2003)	1991-2001	-	22 CEECs and former Soviet states.	Panel data (fixed effects, random effects, dynamic panel).	Ordinal EU membership dummy (EU dummy) (2: 10 countries to become new EU members in 2004, 1: Bulgaria and Romania, 0: others).	Positive and significant. The significance level differs within the range of 1 to the 10% dependeng on the estimation equation.	GDP growth rate of developed countries (+); growth rate of the total FDI to emerging markets (+); GDP per capita (+); fiscal revenue and expenditure (+); GDP ratio to foreign reserves (+); savings/investment ratio (-); progress of systemic transformation in financial sector (+); progress of stractural reform (+); oil endowment (+); liberalization of the currency exchange system (+); 1998 financial crisis (-).
Bevan and Estrin (2004)	1994-2000	18 developed countries (15 European countries, Japan, Rep. of Korea, United States).	11 CEECs and former Soviet states.	Panel data (random effects).	Cologne European Council announcement effect dummy (Cologne) (3: 1998 onward for the Czech republic, Poland, Hungary, Estonia; 2: 1998 onward for Latvia, Lithuania, and Slovakia; 1: 1998 onward for Bulgaria and Romania; 0: others).	Positive and significant at the 1-5% level.	GDP of home country (+); GDP of host country (+); distance between capital cities (-); unit labor cost (-).

Table 2. List of studies that examine the impact of EU Eastern enlargement on FDI into transition economies (concluded)

Study	Analysis period	Target countries		Data type (estimate methods)	Empirical methods and estimation results of FDI promoting effect of EU Eastern enlargement		Other statictically significant FDI determinants
		Home countries	Host countries		Empirical methods	Estimation results	
Egger and	1986-1998	13 developed countries (Australia, Canada, 7 European countries, Japan, Rep. of Korea, New Zealand, United States).	55 countries (including 10 CEECs and Russia).	Panel data (fixed effects).	Comparison of bilateral effects of 15 EU member states and CEECs under the European Agreement obtained from the estimation of the gravity model to the bilateral effects of other countries.	An immediate positive impact of EU Eastern enlargement cannot be confirmed. However, an increase of FDI from EU15 to 7 CEECs, excluding Baltic states in 1995-98, is confirmed.	Total population of host country (-); GDP per capita of home country (+); GDP per capita of host country (+).
Clausing and Dorobantu (2005)	1992-2001	-	28 European countries.	Panel data (pooled OLS, random effects).	Copenhagen European Council announcement effects dummy (copen) (1: 1994 onward for candidate country); "Agenda 2000" first-wave accession candidate group dummy (firstw) (1: 1998 onward for corresponding country) "Agenda 2000" second-wave accession candidate group dummy (secw) (1: 1998 onward for corresponding country).	copen is significant at the 5% level. secw is significant at the 5-10% level.	GDP of host country (+); GDP per capita of host country (+); average compensation rate (-); degree of economic openness (+); corporate income tax ratio (-); degree of economic misery (-).
Suganuma (2006)	1993-2003	-	18 CEECs and former Soviet states.	Panel data (random effects).	2004 new EU member country dummy (1: 10 new EU member countries).	Positive and significant at the 1% level.	Total population (+); GDP growth rate (+); inflation rate (-); interest rate (-); country risk (-); degree of economic freedom (+); degree of progress in enterprise privatization (+); openness of privatization policy (+); proximity to the European market (distance from Germany) (-); endowment of natural resources (+); years of socialist period (-); Russia dummy (-).
Suzuki and Suganuma (2008)	1993-2004	-	32 transitional countries.	Panel data (fixed effects, random effects).	EU accession negotiation dummy (1: year of accession negotiation started and onward for corresponding country).	Positive and significant at the 1% level.	Progress of transition policies (+); GDP per capita (+); potential of natural resources exportation (+); degree of completion of socialism (-).

Source: Compiled by the authors.

As shown in table 2, these prior studies in general strongly suggest a positive relationship between EU accession talks and FDI in countries involved. To this extent, these studies are consistent with our hypothesis. However, on the basis of the facts found in the previous section, we contend that these studies have a number of shortcomings. First of all, although the first stage of the accession negotiation process entailed concluding the association agreement, many of the earlier studies have paid little attention to the fact that differentiation among transition countries from the investor's perspective had already started by this point. Secondly, the fact that the accession process consisted of four political stages and that there were certain differences in the timetable depending on the countries is hardly considered. Thirdly, as a result of the above two points, the earlier studies do not give any consideration to the possibility that the FDI-promoting effect on accession candidate countries may differ at different stages of negotiation, as each has different characteristics. In this sense, it is likely that a dummy variable that captures only a part of the EU Eastern enlargement process and expresses the entire applicable time period as a value of 1 could underestimate or overestimate its impact on FDI. In the following section, we will attempt to estimate a more accurate impacts of EU Eastern enlargement by conducting an empirical analysis that addresses the problems discussed above.

4. Empirical analysis

Empirical research on the location choice for international production has been based for a long time on the so-called OLI approach advocated by Dunning (1958, 1970). This traditional FDI theory argues that several factors, such as the advantages of establishing local affiliates, running costs and market access as opposed to product exports from the home country and the strategic importance of internal retention of intangible assets, including management know-how and proprietary technology, have great influence on decision-making by investment bodies (Ikema, 1992). In contrast to the OLI paradigm, recent FDI theory has incorporated the advantages of ownership and location in the general equilibrium model of international trade and, by endogenously dealing with the emergence of TNCs, given way to a new theoretical angle (Helpman, 1984; Horstmann and Markusen, 1992; Brainard, 1997; Marksen and Venables, 1998, 2000).

FDI into the former Communist states can be approached from either of the above two theoretical viewpoints. From an empirical perspective, both approaches concur that proximity and market size are important determinants of FDI. Therefore, to verify the FDI-promoting

effects of EU Eastern enlargement, proximity and market size are used as control variables in our empirical models along with the progress of systemic transformation to a market economy and the macro-economic dynamism in a host country, both of which are regarded as critical factors affecting FDI into transition economies. It is expected that both elements are positively related to FDI (Brenton et al., 1999; Resmini, 2000).

In this section, we will estimate FDI location-choice models through two different methods. The first method involves a regression analysis that takes the gross FDI inflows into transition economies as a dependent variable. The second entails the estimation of the gravity model by taking the origin-to-destination-specified FDI as its dependent variable. The first method analyzes the gross FDI in 21 CEECs and former Soviet countries featured in table 1 in the period 1990–2005. The latter targets FDI from seven major developed countries (Austria, France, Germany, the Netherlands, Japan, the United Kingdom and the United States) and nine CEECs (Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovakia and Romania), adding up to a total of 63 pairs. For both methods, we will utilize panel data.

For constructing the empirical model, a simple hypothesis relating to the decision-making behaviour of TNCs and other foreign investors is used, assuming that they make an investment decision for a given year by referring to the observable variables of the previous year.[10] This realistic hypothesis is also useful as it avoids possible simultaneous-equation bias in estimation results by adopting predetermined variables as independent variables in our models. With regard to EU accession talks, however, we do not apply this assumption, considering the fact that investors were capable of tracing the progress in the accession negotiations between the EU and candidate countries in real time mainly through information disclosure by the European Commission and the media. EU enlargement is an uncontrollable event for almost all private investors. Hence, we assume that EU accession talks are exogenous for FDI.

In the first phase of the empirical analysis, our actual estimation equation model, where the dependent variable is the total amount of FDI going to the host country *j* in the year *t*, takes the form:

$$\ln FDI_{j,t} = \alpha + \sum \gamma_k EUaccessio\, n_{k,j,t} + \beta_1 \ln GDPSIZ_{j,t-1} + \beta_2 \ln PRISEC_{j,t-1} + \beta_3 GDPGRO_{j,t-1} + \beta_4 INFRAT_{j,t-1} + \beta_5 \ln DISBRA_j + \delta_j + \varepsilon_{j,t} \quad (1)$$

[10] We have estimated a location choice model for FDI to Russia by using the same hypothesis. See Iwasaki and Suganuma (2005).

where *EUaccession* is a set of *k* dummy variables reflecting participation in the EU Eastern enlargement process and the progress of accession negotiations (discussed later); *GDPSIZ* is the market size of the host country measured in terms of the total amount of GDP; *PRISEC* is the ratio of GDP to host country's private sector, which is used as the proxy for the progress of transition to a market economy; *GDPGRO* and *INFRAT* are the real GDP growth rate and the inflation rate of the host country, respectively;[11] *DISBRA* is the direct distance from Brussels to the capital of the host country; δ is the individual (fixed) effect of a host country; and ε is the error term.

Based on the discussions above and the preceding studies listed in table 2, we expect EU accession negotiations, market size, progress of systemic transformation to a market economy, and economic growth to have a positive impact, while high inflation and geographical remoteness from the EU market to have a negative impact on FDI. In order to check the robustness of the estimated results of the above equation, we also estimate an alternative model that replaces the dependent variable with the investment amount per capita (*FDIp*). In this case, the market size of the host country is conditioned by the division of the total population; thus, the independent variable becomes the total value-added per capita (*GDPSIZp*) in lieu of *GDPSIZ*. This variable presents the purchasing power of a host country residents while, at the same time, reflecting the wage level. Therefore, we cannot theoretically predict its effect on FDI at the current stage.

In the second phase of the empirical analysis, we estimate the following equation, which takes the FDI from country *i* to country *j* in the year *t* as the dependent variable:

$$\begin{aligned} \ln FDI_{i,j,t} = \alpha + \sum \gamma_k EUaccession_{k,j,t} + \beta_1 \ln MARSIG_{i,j,t-1} + \beta_2 \ln MARSIM_{i,j,t-1} \\ + \beta_3 \ln PRISEC_{j,t-1} + \beta_4 GDPGRO_{j,t-1} + \beta_5 INFRAT_{j,t-1} \\ + \beta_6 \ln DISCAP_{i,j} + \varphi_{i,j} + \varepsilon_{i,j,t} \end{aligned} \quad (2)$$

where *MAGSIG* is the total amount of GDP of the home and host countries representing the combined market size; *MARSIM* is a measure

[11] The correlation coefficient between *GDPGRO* and *INFRAT* is -0.262. This is far below the threshold level of 0.700, at which the occurrence of multicollinearity should be considered (Lind et al., 2004). The same is applied to other independent variables.

of the similarity in the size of home and host country markets defined by the formula:

$$MARSIM_{i,j,t} = 1 - \left(\frac{GDPSIZ_{i,t}}{MARSIG_{i,j,t}} \right)^2 - \left(\frac{GDPSIZ_{j,t}}{MARSIG_{i,j,t}} \right)^2 \qquad (3)$$

DISCAP is the direct distance between the capital cities of both countries; φ stands for the country-pair effects of the two nations. We predict that *MARSIG* and *MARSIM* have positive signs because both factors promote a horizontal FDI and are neutral in terms of a vertical FDI (Egger and Pfaffermayr, 2004a). Similarly to *DISBRA, DISCAP* is expected to hamper FDI, and it may thus have a negative sign. As in the first phase, we estimate an alternative model with the dependent variable *FDIp*, FDI inflow per capita, instead of *FDI*.

To estimate the FDI-promoting effect of EU Eastern enlargement, we tested three different approaches: the first approach adopts the accession candidate dummy *ACCCAN*, which takes the value of 1 from the year of the conclusion of the association agreement onwards. This variable follows the approach of earlier studies and becomes a benchmark in comparison with the estimated results. Here, it is implicitly assumed that the FDI-promoting effect is constant throughout the negotiation and accession period. We call this the *constant-effect hypothesis*.

The second utilizes the accession negotiation progress dummy *ACCPRO*, which considers that the EU accession talks consist of four different political steps, as we discussed in section 2. This variable gives a value of 1 to the association agreement conclusion stage; 2 to the accession application stage; 3 to the accession negotiation stage; and 4 to the closure of negotiation and accession stage. In other words, *ACCPRO* is based on the assumption that, as accession negotiations move forward a step at a time, the FDI-promoting effect of EU Eastern enlargement increases proportionately. We call this the *increase-effect hypothesis*.

The third is designed to capture the effect of these negotiation steps individually by using four independent variables labelled *ASSSTA*, *APPSTA*, *NEGSTA* and *FINSTA*. It enables different negotiation stages to have different degrees of impact over the decision-making of investment bodies as well as some degree of variation in terms of statistical significance, in case that EU enlargement has a non-linear impact on FDI. We call this the *non-linear-effect hypothesis*. The non-

linear effect may arise when TNCs and other potential investors are not very sensitive to the progress in the accession negotiation and/or when progress in the EU accession talks from a specific stage to the next constrains the use of FDI-friendly policy instruments, such as direct subsidies and corporate tax exemption and, hence, offsets the positive effect of EU enlargement.

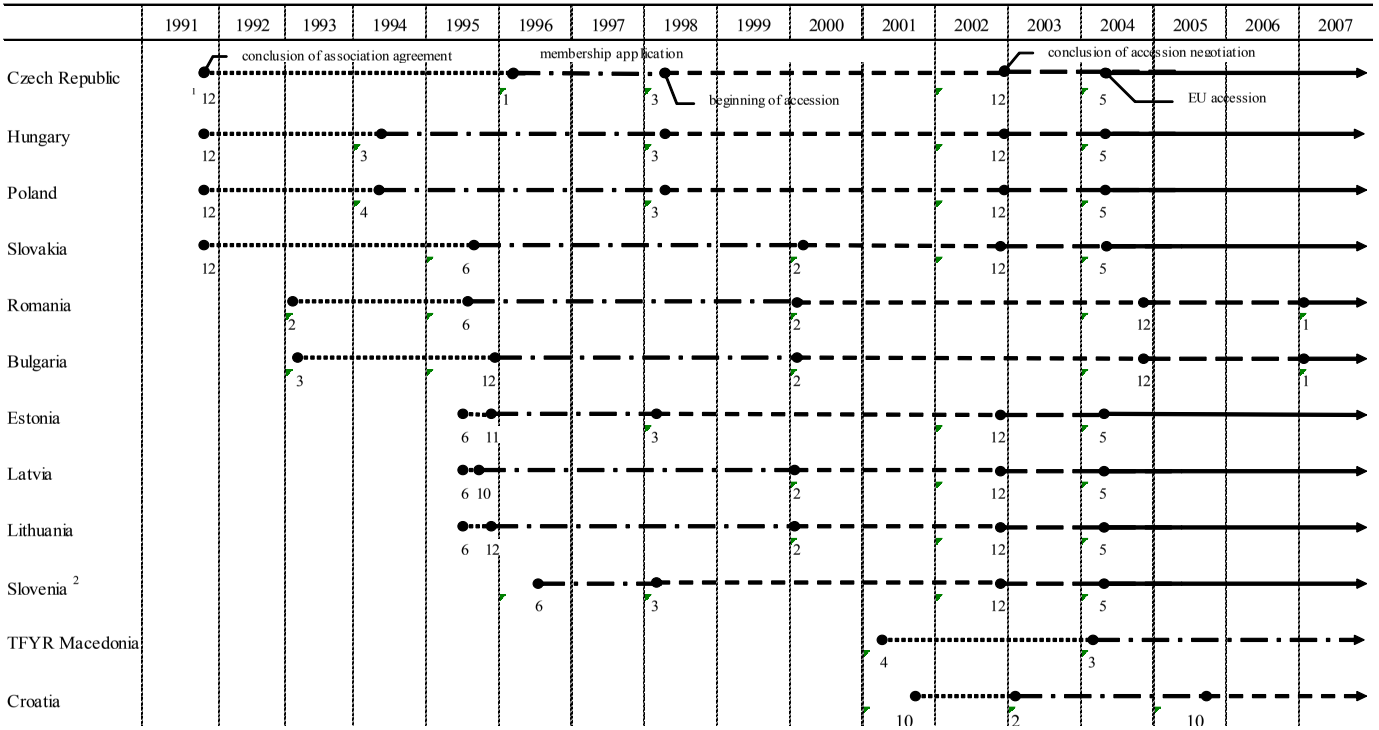
Figure 1 illustrates the accession negotiation process between the EU and 12 acceding CEE countries, including Croatia and Macedonia. As this figure indicates, the timing of political events in each candidate country was very different, and it would not be empirically appropriate to overlook this fact. For instance, according to the Japanese corporations, think-tanks, and governmental agency officials interviewed by the authors, there is at least a six-month lag from the time of the investment decision until investment action is actually taken.[12] Therefore, we set the above-mentioned EU accession variables on the basis of the hypothesis that the FDI-promoting effect will surface in the same year when a political event takes place in the first half of that year, while, when an event occurs in the second half of the year, such an effect is realized in the following year.

Definitions, descriptive statistics and sources of data, including the EU accession variables used in the empirical analysis, are shown in the appendix.

Table 3 represents the result of the first phase of the empirical analysis. Here the Breusch-Pagan and Hausman specification tests support the use of random-effects estimator for all models. This table shows that the control variables have expected signs with statistical significance at the 1 per cent level, except for *DISBRA*. According to the estimation result of models (A), (B), and (C), which take the gross FDI inflow as the dependent variable, the market size, the progress of systemic transformation, and the economic growth of the host country have the effect of inducing FDI. On the other hand, the increase of the price level negatively affects the decision-making of investing bodies. The same inferences can be drawn from models (E), (F) and (G), which take the gross FDI per capita as the dependent variable. In these models, *GDPSIZp* is estimated to be positive and significant at the 1 per cent level. This suggests that TNCs and other foreign investors, on the whole,

12 Based on interviews conducted by Iwasaki with Honda Motor Co., Ltd., Mitsubishi Corporation, the Japan Association for Trade with Russia and NIS, and the Japan External Trade Organization (JETRO). We would like to extend our gratitude to the participants.

Figure 1. Accession negotiation process between the EU and 12 CEECs



Source: Authors' illustration.

[1] This and other figures indicate the month of the event.

[2] In Slovenia, the conclusion of the association agreement and the application for EU membership occurred at the same time.

Table 3. Panel data analysis of gross FDI inflow into 21 CEECs and former Soviet states

Dependent variable [1]	*ln FDI*$_{j,t}$				*ln FDIp*$_{j,t}$			
Model [2]	(A)	(B)	(C) [8]	(D)	(E)	(F)	(G) [9]	(H)
Const.	-4.5161*	-3.6363	-4.3040*	-4.3262*	-1.8979	0.3796	-0.4574	-0.2260
	(-1.81)	(-1.57)	(-1.66)	(-1.80)	(-0.68)	(0.14)	(-0.16)	(-0.08)
EU accession variables [3]								
ACCCAN$_{j,t}$	0.4522**				0.5106***			
	(2.26)				(2.62)			
ACCPRO$_{j,t}$		0.1549***		0.3379**		0.2210***		0.3268**
		(2.60)		(2.12)		(3.81)		(2.15)
ACCPROQUA$_{j,t}$				-0.0468*				-0.0274
				(-1.71)				(-0.93)
ASSSTA$_{j,t}$			0.3331				0.3189	
			(1.43)				(1.40)	
APPSTA$_{j,t}$			0.4206**				0.4915**	
			(1.99)				(2.43)	
NEGSTA$_{j,t}$			0.7020***				0.8242***	
			(2.86)				(3.59)	
FINSTA$_{j,t}$			0.5587**				0.8083***	
			(2.19)				(3.23)	
Control variables [4]								
ln GDPSIZ$_{j,t-1}$	0.7614***	0.7298***	0.7423***	0.7450***				
	(10.30)	(9.45)	(8.97)	(9.69)				
ln GDPSIZp$_{j,t-1}$					0.5910***	0.4692***	0.5020***	0.4891***
					(5.69)	(4.27)	(4.44)	(4.42)
ln PRISEC$_{j,t-1}$	0.7614***	0.7678***	0.7135***	0.7228***	0.7352***	0.7331***	0.6909***	0.7037***
	(4.59)	(4.76)	(4.21)	(4.32)	(5.04)	(5.48)	(4.77)	(4.97)
GDPGRO$_{j,t-1}$	0.0236***	0.0230***	0.0238***	0.0231***	0.0238***	0.0251***	0.0251***	0.0249***
	(3.09)	(2.99)	(3.03)	(3.00)	(3.38)	(3.59)	(3.53)	(3.56)
INFRAT$_{j,t-1}$	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***
	(-3.67)	(-3.58)	(-3.62)	(-3.62)	(-3.18)	(-3.12)	(-3.19)	(-3.14)
ln DISBRA$_{j}$	-0.0040	-0.0768	-0.0190	0.0143	-0.2248	-0.4139	-0.3147	-0.2260
	(-0.01)	(-0.25)	(-0.06)	(0.05)	(-0.65)	(-1.32)	(-0.89)	(-0.08)
N	283	283	283	283	283	283	283	283
Adjusted R^2	0.65	0.65	0.66	0.66	0.65	0.66	0.66	0.66
Wald test (χ^2) / *F* test [5]	460.35***	504.98***	497.45***	509.77***	438.69***	476.18***	467.6***	480.8***
Hausman test (χ^2) [6]	0.22	0.0	0.46	1.70	0.35	0.01	0.33	1.41
Breusch-Pagan test (χ^2) [7]	68.17***	64.84***	67.84***	67.15***	117.29***	109.41***	115.36***	109.78***

Source: Authors' estimation. For details of the definitions, descriptive statistics, and sources of variables, see the Appendix.

[1] *FDI* is gross FDI inflow to 21CEECs and the former Soviet countries. *FDIp* is gross FDI inflow per capita.

[2] All equations are estimated using the random-effects model.

[3] *ACCCAN* is the accession candidate dummy. *ACCPRO* is the accession negotiation progress dummy. *ACCPROQUA* is a quadratic expression of *ACCPRO*. *ASSSTA* is the association agreement conclusion stage dummy. *APPSTA* is the accession application stage dummy. *NEGSTA* is the accession negotiation stage dummy. *FINSTA* is the closure of negotiation and accession stage dummy.

[4] *GDPSIZ* is the total amount of the GDP of the host country. *GDPSIZp* is the GDP per capita of the host country. *PRISEC* is the ratio of the GDP to the host country's private sector. *GDPGRO* is the GDP real growth rate of the host country. *INFRAT* is the inflation rate of the host country. *DISBRA* is the direct distance between Brussels and the capital of the host country.

[5] Test of the null hypothesis that all coefficients are 0.

[6] Spesification test of the random-effects model and the fixed-effects model.

[7] Spesification test of the random-effects model and the pooled OLS model.

[8] *F* test of the null hypothesis that the coefficients of the accession negotiation dummy variables are all the same: F=4.39, p=0.222.

[9] *F* test of the null hypothesis that the coefficients of the accession negotiation dummy variables are all the same: F=9.85, p=0.019.

[10] The *t* statistics are given in parentheses. ***: significant at the 1% level, **: at the 5% level, *: at the 10% level.

invested in the European transition countries because these countries constitute a promising product market and not because the region provides cheap labour for international production.[13]

The EU accession variables hold interesting results. *ACCCAN* is positive and significant in models (A) and (E). This means that the empirical findings of earlier studies are reproduced here in the same way. However, it is highly possible that the use of *ACCCAN* over- or under-estimates the FDI-promoting effect of EU enlargement. This is because, in models (B) and (F), the coefficient of *ACCPRO*, which takes into consideration that the accession negotiation process consists of several political steps, suggests that differences in the progress of negotiation stages may have a distinct impact on FDI inflows in EU accession candidate countries. Nevertheless, the estimation results of models (C) and (G) indicate that it is possible that the hypothesis behind *ACCPRO* (i.e. accession negotiation step-up proportionally encourages FDI) may also have some problems. This is because *FINSTA*, the dummy variable featuring the closure of negotiation and accession stage, is estimated to be below that of *NEGSTA*, the variable capturing the accession negotiation stage. Overall, the estimates of the EU accession variables in these six models suggest that the non-linear-effect hypothesis is more applicable than the alternative hypotheses.

Table 4 shows the result of the second phase of the empirical analysis.[14] The gravity model of bilateral FDI supports the policy implications discussed above. However, *MARSIM* loses its statistical significance in models that take FDI per capita as the dependent variable. The same happens to *PRISEC* and *GDPGRO* when the fixed effects model is chosen.

What we should emphasize more is the estimation results of the EU accession variables. In other words, with the gravity model, *ACCCAN* is insignificant in both models (I) and (M), whereas *ASSSTA* is positive and significant at the 1 per cent level in models (K) and (O). These results suggest that, when the target countries of empirical analysis are limited to the CEECs that have accomplished EU accession, the simple hypothesis that the FDI-promoting effect is constant throughout

[13] The distance from Brussels to the capital of the host country *(DISBRA*) is insignificant. We re-estimated the regression using the direct distance from Munich or Hamburg instead of Brussels and found no improvement in the estimation results.

[14] Our empirical models showed mostly the same estimation results when using a two-way model, which controlled time effects, as well as the individual effects of the host country or the country-pair effects.

Table 4. Panel data analysis of bilateral FDI inflow from 7 developed countries to nine CEECs

Dependent variable [1]	*ln FDI*$_{i,j,t}$				*ln FDIp*$_{i,j,t}$			
Estimation method [2]	RE	RE	FE	RE	RE	RE	FE	RE
Model	(I)	(J)	(K) [8]	(L)	(M)	(N)	(O) [9]	(P)
Const.	-4.6273*** (-3.1)	-1.8117 (-1.1)	-34.4134*** (-2.8)	-0.1652 (-0.1)	-2.2820** (-2.2)	0.7422 (0.6)	-23.6619** (-2.5)	1.3825 (1.2)
EU accession variables [3]								
ACCCAN$_{j,t}$	0.5458 (1.60)				0.0716 (0.33)			
ACCPRO$_{j,t}$		0.2881*** (3.22)		1.2742*** (4.04)		0.3006*** (4.60)		0.6629*** (3.23)
ACCPROQUA$_{j,t}$				-0.1776*** (-3.27)				-0.0651* (-1.78)
ASSSTA$_{j,t}$			1.0721*** (3.27)				0.5873*** (2.72)	
APPSTA$_{j,t}$			1.3761*** (3.02)				0.8260*** (2.90)	
NEGSTA$_{j,t}$			1.7456*** (3.46)				1.1237*** (3.30)	
FINSTA$_{j,t}$			1.3675** (2.33)				0.9087** (2.16)	
Control variables [4]								
ln MARSIG$_{i,j,t-1}$	0.8933*** (5.08)	0.6675*** (3.92)	2.7447*** (2.95)	0.7541*** (4.38)	0.4939*** (4.24)	0.3339*** (2.95)	1.8675*** (2.61)	0.3593*** (3.16)
ln MARSIM$_{i,j,t-1}$	0.4465*** (3.70)	0.3685*** (3.20)	0.0550 (0.15)	0.3967*** (3.46)	0.0105 (0.14)	-0.0610 (-0.84)	0.1114 (0.40)	-0.0524 (-0.73)
ln PRISEC$_{j,t-1}$	1.2747*** (4.75)	0.9707*** (3.28)	-0.0321 (-0.09)	0.1822*** (3.50)	1.1064*** (6.02)	0.5375*** (2.83)	-0.0653 (-0.27)	0.2502** (2.08)
GDPGRO$_{j,t-1}$	0.0335** (2.30)	0.0417*** (2.89)	0.0200 (1.52)	0.0459*** (3.28)	0.0138 (1.35)	0.0214** (2.18)	0.0096 (1.05)	0.0233** (2.40)
INFRAT$_{j,t-1}$	-0.0019*** (-3.00)	-0.0018*** (-2.92)	-0.0012** (-2.29)	-0.0015*** (-2.70)	-0.0012*** (-3.59)	-0.0009*** (-3.21)	-0.0004* (-1.67)	-0.0008*** (-3.01)
ln DISCAP$_{i,j}$	-1.1278*** (-4.49)	-0.9774*** (-4.14)	(dropped)	-1.0658*** (-4.44)	-0.9839*** (-5.90)	-0.9006*** (-5.59)	(dropped)	-0.9277*** (-5.77)
N	520	520	520	520	520	520	520	520
Adjusted R^2	0.33	0.34	0.38	0.36	0.27	0.30	0.33	0.31
Wald test (χ^2) / *F* test [5]	149.60***	174.87***	25.69***	194.98***	164.14***	204.41***	25.15***	218.55***
Hausman test (χ^2) [6]	8.28	0.18	55.55***	0.23	2.36	7.50	33.18***	9.89
Breusch-Pagan test (χ^2) [7]	420.19***	431.15***	444.64***	453.03***	368.62***	416.57***	384.72***	406.70***

Source: Authors' estimation. For details of the definitions, descriptive statistics, and sources of variables, see the Appendix.

1 *FDI* is the bilateral gross FDI inflow from 7 major developed countries t 9 CEECs. *FDIp* is bilateral gross FDI inflow per capita.

2 RE: random-effects model, FE: fixed-effects model.

3 *ACCCAN* is the accession candidate dummy. *ACCPRO* is the accession negotiation progress dummy. *ACCPROQUA* is a quadratic expression of *ACCPRO*. *ASSSTA* is the association agreement conclusion stage dummy. *APPSTA* is the accession application stage dummy. *NEGSTA* is the accession negotiation stage dummy. *FINSTA* is the closure of negotiation and accession stage dummy.

4 *MARSIG* is the total amount of the GDP of the home and host countries. *MARSIM* is the similarity in the bilateral market size of the home and host countries. *PRISEC* is the ratio of the GDP to the host country's private sector. *GDPGRO* is the GDP real growth rate of the host country. *INFRAT* is the inflation rate of the host country. *DISCAP* is the direct distance between the capitals of the home and host countries.

5 Test of the null hypothesis that all coefficients are 0.

6 Spesification test of the random-effects model and the fixed-effects model.

7 Specification test of the random-effects model and the pooled OLS model.

8 *F* test of the null hypothesis that the coefficients of the accession negotiation dummy variables are all the same: F=4.10, p=0.007.

9 *F* test of the null hypothesis that the coefficients of the accession negotiation dummy variables are all the same: F=3.61, p=0.013.

10 The *t* statistics are given in parentheses. ***: significant at the 1% level, **: at the 5% level, *: at the 10% level.

the accession negotiation period is inadequate in order to validate the EU enlargement effect. Moreover, the positive and highly significant estimation results of *ASSSTA*, as those of the other EU accession variables in models (K) and (O), strongly suggest that TNCs in seven major developed countries responded to the new opportunities, even at the very beginning of the EU enlargement process, by undertaking FDI into the European post-communist countries. In this sense, our empirical evidence supports the view that TNCs with high risk-management capability tend to courageously enter newly emerging markets.

Most importantly, the estimates of the EU accession variables in the above six gravity models, as well as those in the regression models taking the gross FDI inflow as the dependent variable, strongly support the non-linear-effect hypothesis. In other words, the EU accession negotiation process and the inflows of FDI in candidate states are not a simple monotonic relationship, but resembles a reverse J-shaped relationship. To verify the presence of this curvilinear effect of EU Eastern enlargement on FDI, we re-estimated models (B), (F), (J) and (N) with a quadratic expression of the five-point accession negotiation progress dummy (*ACCPROQUA*) along with the linear term. Models (D), (H), (L) and (P), respectively, present the results. *ACCPRO* is estimated to be positive with statistical significance at the 5 per cent level or less in all four models, and *ACCPROQUA* is negative and significant at the 10 per cent level or less in models (D), (L), and (P). Hence, we surmise that the positive effect of advance toward EU membership eventually diminished and was smaller at the closure of negotiation and accession stage than at the accession negotiation stage.

One of the possible interpretations of these empirical results is that, when the EU accession became almost certain, the accession candidate government was forced into a sharp reduction or total abolition of favourable investment treatments available to foreign companies until then and had to give way to political pressure from the European Commission. These policy changes had a negative effect on attracting large-scale investments in particular. The drastic overhaul of favourable FDI incentives is one example. The cases occurring in Hungary and Poland alone affected more than European, Japanese and the United States enterprises and drew great opposition from them.[15] Although the

[15] For instance, *Nihon Keizai Shimbun* reported the following: "On June 19 [2002], the Polish government held a closed meeting at the Ministry of Finance to explain the current situation involving EU accession negotiations to Japanese, United States, and European companies, which may incur passive damages from the tax relief removal. At the meeting, numerous representatives of foreign corporations expressed their

Government of Poland promised compensation to these corporations for the damage resulting from the early termination of favourable incentives and the Government of Hungary launched the "Smart Hungary" programme, which is the most generous investment support plan to the maximum extent of the EU uniform criteria, these measures were not at all attractive in comparison to the abolished FDI incentives, such as ten-year corporate tax exemption and customs-free zones. It is possible that this event threw cold water over new investment plan of Western corporations and investors for the candidate countries in the final stage of the EU enlargement process.

5. Concluding remarks

In this paper, we studied the FDI-promoting effect of the EU's eastward expansion. It is highly possible that accession negotiations with the EU have greatly encouraged western investors in their FDI into candidate countries through the expansion of trade with the European integrated market and the reduction in country risk. However, our empirical evidence strongly suggests that the effects were not at all constant throughout the negotiation period, contrary to what earlier studies have implicitly assumed. This is because each of the negotiation stages may have a different impact on the decision-making of investors.

We found a general trend, i.e., as EU accession negotiations progressed and moved to higher political stages, the FDI-promoting effect progressively increased. However, we also found that a complete revision of the existing investment incentives carried out as compensation for obtaining the confirmation of EU accession might have had an adverse influence on FDI at the very end of political negotiations with the EU. Therefore, we conclude that the causal relation of EU Eastern enlargement and FDI enjoyed by accession candidate countries can be characterized as having a positive correlation. However, this is not a monotonic relationship; rather, it is of a reverse J-shaped nonlinearity. The finding suggests that certain policy coordination in the FDI incentive strategy was needed between the EU and acceding countries.

When adopting the non-linear-effect hypothesis, the FDI-promoting effect of EU enlargement, even when taking into consideration the adverse effect discussed above, is higher than the expected effect

dissatisfaction with harsh words. Government officials left in the midst of a storm in a cloud of insults and angry roars" (NKS, 9 July 2002).

when presupposing the constant-effect hypothesis. According to our simulation based on the estimation results shown in table 3, the periodical cumulative impact of the EU Eastern enlargement variables on FDI received between 1990 and 2005 by 12 CEECs is higher in the non-linear-effect hypothesis than that in the constant-effect hypothesis (69.861 versus 60.593 respectively). The difference is remarkable when considering investment per capita (84.087 versus 68.419 respectively). In other words, if the non-linear-effect hypothesis reflects the reality more appropriately than the constant-effect hypothesis, it can be concluded that the policy efforts made by the former Communist states, focusing on integration to the European unified market, brought much more economic benefits than what has been generally believed.

Appendix. Definitions, descriptive statistics, and sources of variables used in empirical analysis

Variable name	Definition	Descriptive statistics					Source
		Mean	S.D.	Median	Max.	Min.	
FDI (in Table 3)	Gross FDI inflow to 21CEECs and the former Soviet countries (million US dollars)	1248.9	2257.9	301.5	15444	1	UNCTAD public data.
FDI (in Table 4)	Bilateral gross FDI inflow from 7 major developed countries to 9 CEECs (million US dollars)	236.8	504.8	57.9	4263.3	1.2	OECD public data.
ACCCAN	Accession candidate dummy	0.4	0.5	0	1	0	Set up by authors.
ACCPRO	Accession negotiation progress dummy (5-point scale)	1.0	1.4	0	4	0	As above.
ASSSTA	Association agreement conclusion stage dummy	0.1	0.2	0	1	0	As above.
ACCSTA	Accession application stage dummy	0.1	0.3	0	1	0	As above.
NEGSTA	Accession negotiation stage dummy	0.1	0.3	0	1	0	As above.
FINSTA	Closure of negotiation and accession stage dummy	0.1	0.3	0	1	0	As above.
GDPSIZ	Total amount of GDP of host country (million US dollars)	34408.1	69698.5	12583	578017	168	World Bank (1996), EBRD, *Transition Report*.
PRISEC	Ratio of GDP to host country's private sector (%)	49.6	23.4	55	80	5	Authors' estimation based on EBRD, *Transition Report*, and other materials.
GDPGRO	GDP real growth rate of host country (%)	0.7	10.5	3.3	86.0	-52.6	World Bank (1996), EBRD, *Transition Report*.
INFRAT	Inflation rate of host country (%)	214.6	1045.0	11.9	15606.5	-1.2	As above.
MARSIG	Total amount of GDP of home and host countries (million UD dollars)	2185976.9	2754260.6	1305877	11928389	136447	Authors' calculation based on EBRD, *Transition Report, and* OECD public data.
MARSIM	Similarity in the bilateral market size of home and host countries	0.1	0.1	0.0	0.5	0.0	As above.
DISBRA	Direct distance between Brussels and the capital of host country (km)	1615.6	656.8	1582.7	3295.4	704.3	Authors' calculation.
DISCAP	Direct distance between the capitals of the home and host countries (km)	2723.9	2739.7	1431.7	9173.6	142.7	As above.

Source: Compiled by the authors.

Note: For a more precise definition of the EU accession variables, see Section 4.

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RESEARCH NOTES SPECIAL: MEASURES AND INDICATORS OF INTERNATIONALIZATION

Conceptual issues behind the assessment of the degree of internationalization *

Grazia Ietto-Gillies **

This article first discusses four major research contexts on internationalization, namely the level of aggregation, internationalization modes, activities configuration and other specific elements at the firm level. This is followed by the identification of three measures of geographical distribution: intensity, extensity and geographical concentration. Discussions of issues concerning the construction and choice of indices are followed by a brief analysis of the effects of internationalization and how they and the underlying theories of the motivations behind international activities should drive the search for appropriate indices. Four examples on the linkages between theoretical approaches to the effects and the development of appropriate indices are discussed, namely, innovation, trade, TNCs' bargaining power and performance. The article concludes that: (a) the degree of internationalization is a multifaceted concept and therefore there is no unique, "correct" index; and (b) the theoretical and conceptual frameworks behind the effects of internationalization are key to the development of appropriate indices.

Key words: internationalization; transnational corporations; indices of internationalization; internationalization and innovation; transnationals and bargaining power; trade; performance and internationalization.

JEL classification: F20**,** F21, F23.

1. Introduction

The last 25 years have seen a growing number of studies on the assessment of the degree of internationalization (Dunning and Pearce, 1981;

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Sullivan, 1994; Dunning, 1996; Ietto-Gillies, 1998; UNCTAD, 1995 and following years[1]). These studies present the development of new indices or the computation of existing indices. They differ in many respects, including the terminology used; some authors use the generic term internationalization while others refer to the degree of multinationality, the degree of transnationality or even the degree of globalization. I shall here use the term internationalization in a general and inclusive way.

A variety of variables are used in the literature to capture the concept of internationalization, ranging from macro variables, such as foreign direct investment (FDI) and trade, to firm-level ones, such as the number of foreign affiliates and the value of foreign sales. I consider all such variables to be "indicators" of internationalization. The terms variable and indicator will be used interchangeably in this article.

From various indicators, a variety of indices with differing degrees of sophistication have been developed: an index is arrived at by applying mathematical and statistical techniques to one or more indicators. The techniques can be as simple as percentage ratios or more sophisticated such as Herfindhal indices.

The aim of this article is not to develop specific indices or to do a full review of the indices already in the literature.[2] Indeed, I feel that there is a need to pause, reflect and ask ourselves: is internationalization a unique concept that can be identified by a unique construct? Is it possible to identify a unique index or a unique approach to the construction of indices of internationalization which can be used in all circumstances? What is the meaning we can attach to various measures of internationalization? Why do we want to develop indices of internationalization? These questions cannot easily be answered by referring to existing research. They therefore constitute a gap, which the present paper aims to fill. The gap relates to the need for clarification of the conceptual underpinning to the degree of internationalization.

The paper proceeds as follows. The next section considers various research contexts within which internationalization can be analysed. Section 3 considers three main measures of international activities: intensity, extensity and geographic concentration. Section 4 discusses construction issues, and section 5 the choices deriving from different perspectives and measures. Section 6 briefly analyses the effects of

[1] More specific and recent references in section two.

[2] A very useful review and critical discussion of indices is in Dorrenbacher (2000). See also UNCTAD (2007).

international business activities that are relevant for the choice of indices. Section 7 gives four examples of linkages between underlying theories and the choice of indicators and indices. The last section summarizes and concludes.

2. Indices of internationalization in different research contexts

Internationalization can be considered in a variety of research contexts each giving scope for the development of a variety of indicators and indices. "Research context" here refers to the specific area of interest to the project and the researcher; whether, for example, the researcher is interested in looking at internationalization in terms of trade or FDI or at the macro or micro level. The following are the main contexts within which indices of internationalization have been developed in the literature.

2.1 Level of aggregation

Internationalization can be assessed by applying different levels of aggregation. The United Nations Conference on Trade and Development (UNCTAD) has been publishing several ratios related to FDI by country in its annual *World Investment Report*, such as FDI flows as percentage of the country's GDP or gross domestic fixed capital formation (GDFCF). Heshmati (2006) develops a composite index of a country's globalization using a variety of indicators for the following components of globalization: economic integration, personal contact[3], internet technology and political engagement.

The majority of indicators and indices in the international business literature are at the firm level and, for reasons of data availability, most studies examine the largest transnational corporations (TNCs) rather than smaller firms (UNCTAD, 2001, 2007). Some authors use a combination of macro and firm level indicators (Fisch and Oesterle, 2003). In an attempt to develop measures of globalization, OECD (2005a, 2005b) suggests a detailed list of indicators (and some indices) related to FDI, activities of TNCs, international dissemination of technology and trade.

In principle, it should be possible to consider indices at the industry level: some industries are more internationalized than others

[3] "Personal contact is charted by looking at international travel and tourism, international telephone traffic, and across-borders money transfers" (Heshmati, 2006: 4).

either for reasons linked to resources access or for reasons linked to markets. However, in practice, there are not many indices specifically developed and applied at the industry level. What we tend to see are indices developed and estimated at the level of firms and the results grouped and analysed by industry (Ietto-Gillies, 2002: chapter 5; UNCTAD, various issues of the *World Investment Report*).

2.2 Internationalization mode

Indices can be developed for various modalities of internationalization from trade (imports or exports or both) to FDI to licensing to collaborative agreements. It is also possible to develop indices related to financial flows both at the macro and micro levels (Hassel et al., 2001). Petri (1994) estimates and juxtaposes gravitation indices of trade and FDI.

Two aspects tend to be overlooked in the literature. The first concerns the mode of entry in the case of FDI, i.e. the extent to which the degree of internationalization is linked to greenfield investment or to mergers and acquisitions. This is an issue of relevance at both macro and micro levels. The second is the use of outsourcing, which tends to be neglected for both conceptual and data availability reasons. The choice between internalization and outsourcing has become a very important strategic issue in the last 25 years. Yet, it has attracted very little interest from researchers working on the measures of internationalization either at the level of development of indices – which is understandable given the paucity of data – or at the level of interpretation of results. Regarding the paucity of data (OECD, 2005b: 205–208), the situation is improving; some data are now becoming available (Lewin and Peeters, 2006) and this may allow the development of specific indices in the future.

2.3 Activities configuration

The issue of internalization versus outsourcing of production activities, in fact, applies both at the domestic and international levels. A related organizational aspect is the configuration of activities (Porter, 1986), i.e. the extent to which different segments of the value chain are located within the same country or across frontiers and indeed whether – in either case – they are internalized or sub-contracted. Asmussen et al. (2007) develop an index that measures the extent to which different segments of the value chain are located internationally. In the construction of the index, the authors use matrix analysis and apply primary data from a specific survey of Danish TNCs. Van den Berghe (2003) also takes account of such configuration of production.

2.4 Different elements within the firm

In assessing the degree of internationalization of firms, some indices focus on indicators of performance, such as profits, sales or financial indicators (Hassel et al., 2001); others make use of a variety of indicators including structural and/or organizational ones. Examples of the latter can be found in UNCTAD (2007) which considers a "stakeholders' perspective", including the nationality of managers, as well as the spatial organization of management. Sullivan (1994) includes "Top managers' International Experience" among its variables.

The variety of research contexts and of possible variables within each is an indication that there is not a single unique concept of internationalization. The obvious conclusion from this is that no single index can capture all the aspects of internationalization. The choice of context and of variables/indicators within them depends on the specificity of the research project, which includes elements such as the choice of countries, firms, industries or the time-scale. However, the research context is not the only element of choice in the development of indices. Another important element is discussed in the next section.

3. Three measures of geographical distribution

Whatever the research context and boundaries, and therefore, whatever the level of aggregation, internationalization mode, activities configuration or other factors within the firm we wish to concentrate on, we need to consider the conceptual approach to the geography of internationalization. Conceptually, internationalization can be seen in terms of "activities"[4] away from the home country. In this case, the stress is on the dichotomy between foreign and domestic. This measure of internationalization is referred to as intensity.

A different way of looking at internationalization is to put more emphasis on the geographic spread or concentration of international activities. In this case, the relevant measures of internationalization are the number of countries in which activities take place (the geographic extensity) or the degree to which activities are concentrated among foreign countries (the geographic concentration).

[4] As mentioned above, internationalization can be – and has been - expressed by a variety of variables not all of them related strictly to production/ business activities. The word activity(ies) will be used throughout in a very general sense which encompasses all possible business-related variables.

3.1 Intensity

A measure of the intensity of international activities focuses on the dichotomy between foreign and domestic activities of the firm. It measures the degree of internationalization by comparing the size of foreign activities in relation to the size of domestic activities or in relation to total activities (domestic and foreign). For most intensity indices, "foreign" activities are considered all together, irrespective of the number of foreign countries in which they take place.

The variables/indicators chosen to express "foreignness" vary according to the research contexts, for example, the level of aggregation (e.g. firm level, country level etc.) or the internationalization mode under analysis (e.g. trade, foreign investment, alliances etc.). For instance, a measure of intensity at the firm level is foreign sales as a proportion of domestic sales or as a proportion of the total sales. At the industry level, we could assess the value of activities abroad in relation to the activity in the domestic economy or the total. As regards the macroeconomy we can, for example, develop indices of a country's foreign investment or trade in relation to the size of the domestic economy measured by its GDP.

3.2 Geographic extensity and concentration

The intensity measure is based on the analysis of the dichotomy between home and abroad. However, "abroad" could be one country or 50 countries. Furthermore, the distribution of activities may be concentrated in a few countries among many or evenly spread over all countries. There are effects for which the number of countries in which activities take place or resources are located is of relevance. In other cases, the geographic concentration of resources or activities may be of interest. Thus, authors have tried to develop indices that capture this aspect of internationalization:

1. *Geographic extensity* measures capture the overall geographic scope of operations in terms of the number of countries which the activities are spread over. The indices can be expressed in absolute terms (1a) or in relative terms (1b) (as discussed in section 4).

2. *Geographic concentration* measures capture the degree of spatial (usually by nation-state) concentration of activities within a specific region independently of the size of activities and/or the number of countries involved.

An index of geographic extensity highlights the relevance of operating in many or few countries while an index of geographic concentration stresses the distribution of operation over countries/regions independently of the number of countries/regions involved.

Similar to the intensity indices, those related to the geographic scope can be considered at various levels of aggregation and for different internationalization modes (such as trade or FDI).

4. The construction of indices

For any specific research context (section 2) and for any of the three measures (section 3), it is possible to derive a specific index. At the most basic level, an intensity index is just a percentage: e.g. sales abroad as a percentage of the company's total sales at the micro level and export or imports as percentage of GDP at the macro level. It is also possible to develop intensity indices using non-value indicators, such as the number of the foreign affiliates in relation to the total number of affiliates (Ietto-Gillies, 1998, 2002).

For measuring the geographic scope, the basic idea is to construct indices that take account of the distribution of activities in various countries. For geographic extensity, given the paucity of data on firms' activities in different countries, authors have used the number of foreign countries as the indicator without normalization (1a) (Anastassopoulos and Rama, 2004) or with normalization (1b) (Ietto-Gillies, 1998 and 2002; Sanders and Carpenter, 1998). The normalizer in Ietto-Gillies's works is the total number of countries in receipt of inward FDI minus one. The countries in receipt of inward FDI is taken to be an indication of potential for foreign investment in that country; the subtraction of one eliminates the home country from the total. In this case the index – called Network Spread Index (NSI) – can vary between 0 and 1. Sanders and Carpenter (1998) use the number of countries in which a firm has activities as a percentage of the largest number of countries a single firm in their sample has a presence. The index is equal to one for the firm with a presence in the largest number of countries. Whatever the index and the variables chosen, the normalizer is selected according to what type of index one wishes to construct.

In the concentration measures, the relevant geographic element is captured in terms of concentration of activities in certain countries or regions. Several indices have been used, such as the Herfindhal index (Davies and Lyons, 1996: chapters 7 and 11; Ietto-Gillies, 2002:

chapter 4), Lorenz curves (Fisch and Oesterle, 2003), and the degree of "gravitation" of foreign activities towards specific regions or areas (Petri, 1994).

In addition to the research context and geographical measure, three further issues are relevant in the construction of indices. The first is the number of variables to be used. Some indices are simple, uni-variable while others are composite, multi-variables. The former are constructed by using a single variable such as sales, employment or profits (Dunning and Pearce, 1981). UNCTAD's *World Investment Report* publishes three uni-variable intensity indices for the world's 100 largest TNCs. They are calculated as the ratio of foreign sales to total sales; of foreign assets to total assets; and of foreign employment to total employment. These three indices are then combined into a single composite one – the simples average of the three – called the Transnationality Index (TNI). Similarly, Dunning (1996) uses three uni-variable indices based on assets, employment and R&D to arrive at a final transnationality index. Sullivan (1994) constructs a composite five-variables index based on firms' "sales", "profits", "assets", "top managers' international experience" and "psychic dispersion of international operations".

The second issue is whether or not to develop complex indices in which intensity and extensity measures are combined. Gomes and Ramaswamy (1999) combine two intensity and one extensity indices. Similarly, van den Berghe (2003) develops an index that combines intensity and extensity as well as activities configuration. Ietto-Gillies (1998) combines the UNCTAD TNI with her extensity index, the NSI. Lastly, there is the issue of data, in particular, whether to use cross-section data or time series data; primary or secondary data.

In many cases, the drive towards multi-variables or complex indices is the desire to arrive at the "ultimate measure of internationalization" by taking account of several indicators, sub-indices or by taking account of more than one measure. However, sophistication and complexity can generate their own problems. The pitfalls of constructing multi-variables indices are highlighted in Ramaswamy et al. (1996). Moreover, multi-variables and multi-dimensions indices tend be difficult to interpret.

5. Spoilt for choice

Figure 1 summarizes the various elements of indices discussed in the previous sections regarding different research contexts, geographic measures and construction issues. Each element as well as combinations

of various elements can lead to a specific index. There are indeed many, many possible indicators and indices of internationalization: we are spoilt for choice. The many choices we face include the following:

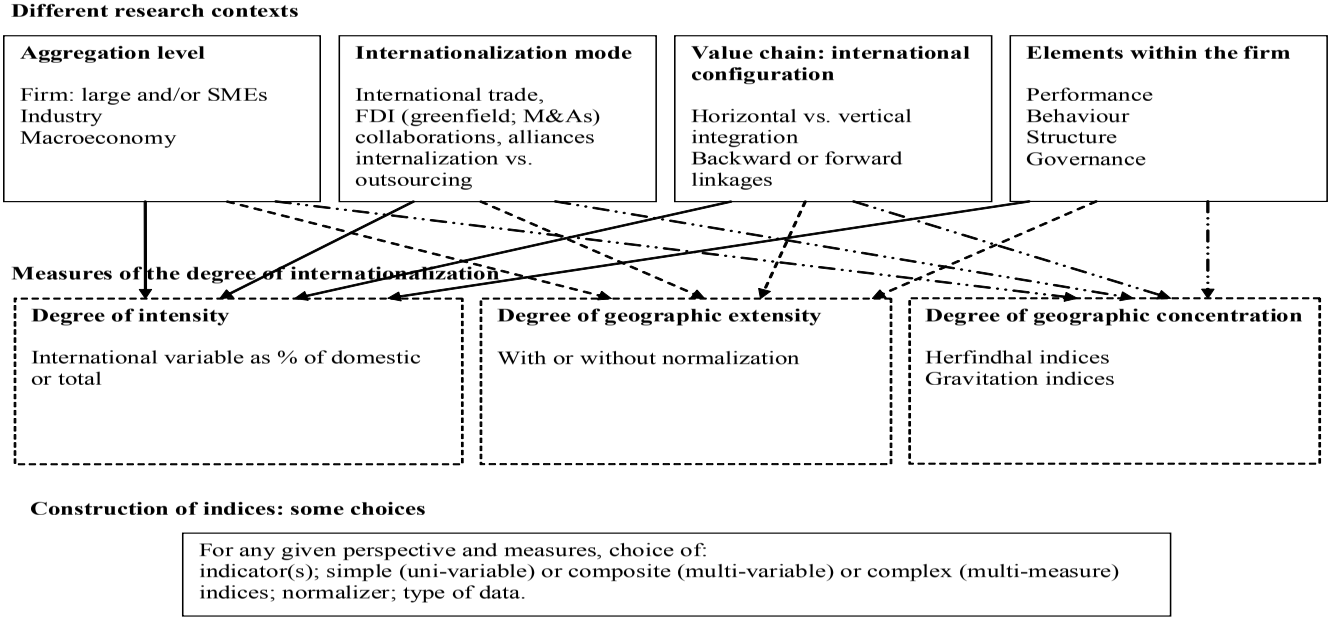
- choice of research context within which internationalization is to be analysed;
- choice of geographic measure (intensity, extensity or concentration);
- choice of indicator(s)/variables within each research context and geographic measure;
- choice between single and multi-variable(s) indices or single and combined geographic measures;
- choice of normalizer; and
- choice of mathematical/statistical structure of the index as well as choice of type of data.

The choice implicit in the first three research contexts – as in figure 1 – and the many elements within them is often not a problem because the decision is usually determined by the research agenda. We would know at the outset whether we wish to study at the firm, industry or macro economy level, and which internationalization mode we are interested in.

Nonetheless, we are still left with many choices and, most relevant, with the choice among extensity, intensity and concentration measures. Different measures mirror different conceptual approaches to internationalization. How do we decide? Let us look at the task(s) we wish our indices to perform or to assist us in. The actual operationalization of our measures should be guided by the task(s) we assign to our indices.

At the more practical level, once we focus on a specific approach to the development and construction of indices, we have to confront the problem of availability of data. This is likely to have an impact on our choice of variable(s) and/or the period of analysis. It should not, however, affect our choice of measures (extensity, intensity or concentration) because the constraints on the availability of data should not be a reason to compromise on our conceptual framework on internationalization. To do that might constrain our ability to derive conclusions regarding effects of internationalization. This issue is the subject of the next two sections.

Figure 1. Elements in the development of indices of the degree of internationalization



6. Effects of international activities

At one level, indices are usually used to make comparisons between firms, between industries or between countries/regions at a particular point in time or across several years. At a deeper level, indices are always, directly or indirectly, used to draw comparative inference about some effects of international activities, be they related to the performance of firms, industries or economies and with regard to a variety of performance indicators. The ultimate aim may be to use this inference to assist firms and other business actors, such as labour organizations, involved in and/or affected by the international activities of TNCs to develop appropriate strategies. It can also assist governments to develop relevant policies.

There is a large literature on the effects of international activities of TNCs (OECD, 1994; UNCTAD, 1994 and 2002; Barba Navaretti and Venables, 2004; Ietto-Gillies, 2005) and indeed there are many aspects to the assessment of effects. The assessment of the effects – of whatever type and at whatever level of aggregation – requires a strong theoretical basis. There are two reasons for this.

The first stems from the fact that in order to say something meaningful about effects, we must begin the analysis by understanding the motivations behind the drivers of internationalization: why internationalization takes place and why it takes a specific form/mode; why firms engage in FDI and/or licensing; why some industries appear to be more projected towards production and/or markets in foreign countries compared to others; why some countries are relatively more open to trade or FDI than others; and whether or how trade is related to their FDI record. For these questions, we do not have ready-made answers; all we have are theories (Buckley and Ghauri, 1999; Cantwell, 2000; Ietto-Gillies, 2005).

The second reason is that even when we agree on the motivation behind internationalization, we still have to understand and work out the specific effects that arise from international activities. Here again, we do not have ready-made answers but theories and hypotheses to be subjected to tests. Therefore, there are implicit or explicit theories behind the effects as well as the reasons for the foreign activities that produce those effects. This means that any index of internationalization that aims to shed light on the effects must take account of the theories on the motivations for internationalization and on the relationship between such motivations and the effects of internationalization. The ultimate choice of variables and indices depends on: (a) what effects of internationalization we are

interested in; (b) what theoretical explanations we have regarding the motivations behind international activities and the relationships between those explanations and effects; and (c) how we link those theoretical aspects to the indices.

7. Linkages between theory and geographic measures of indices: four examples

The linkage between the theoretical basis of the effects and the measurement of the degree of internationalization is particularly relevant to the choice among intensity, extensity and concentration indices. They are all relevant for making comparisons; however, the preference for one measure over others very much depends on which effects we are interested in and what theory lies behind them.

This section presents four examples to illustrate the linkages between the development of indices and the theoretical underpinning behind the assessment of the effects. Specifically, we shall consider the effects on:

- knowledge acquisition and innovation;
- volume and structure of trade;
- TNCs' bargaining power; and
- performance indicators.

7.1 Innovation

The contribution of internationalization to innovation can be linked to the different internationalization modes (trade, FDI via greenfield or M&As, licensing or joint ventures). Whether we concentrate on a specific mode or not depends on the theory we have about the impact of TNCs on development and diffusion of innovation. We may, for example, work on the theoretical assumption that direct production has a strong impact on the diffusion of innovation, or on the assumption that such effects can be achieved via alliances and/or via trade. Moreover, it is possible to work at various levels of aggregation in assessing the impact of internationalization on innovation. It is also possible to draw inference about the comparative impact of the international location of horizontal and vertical activities on innovation and knowledge diffusion.

There are, however, deeper theoretical linkages between internationalization and knowledge development and diffusion that are

related to the different measures of internationalization discussed in section 3.

The link between transnationalization and the development and diffusion of innovation and technology was, for a long time, dominated by the international product life cycle (IPLC) model (Vernon, 1966). This model is product-centred, and puts forward a hierarchical view of innovation. The diffusion of innovation and technology is seen – in the original paper by Vernon – as moving linearly from the most developed country (the United States) to others, first European countries and later to developing countries. Indeed, we talk, in the context of the IPLC, of technology transfer rather than technology diffusion.

Building on the evolutionary theory of the firm and of the TNC (Nelson and Winter, 1982; Kogut and Zander, 1993), more recent literature has challenged this view on the development and diffusion of innovation and technology (Cantwell, 1989 and 1995) in favour of a more dialectical and interactive relationship. In the latter approach, various units of the TNC spread knowledge and innovation within the company itself through their operation in various countries and therefore through the TNC's internal linkages.

Units of the corporation – be they affiliates or headquarters – learn also from the environments in which they operate and their knowledge is transferred internally to other parts of the company within the same country or abroad. They learn from the local environments via their linkages with customers, suppliers and distributors as well as, in many cases, via innovation-specific collaborative agreements with other firms. For the company as a whole, two types of networks are of particular relevance for innovation acquisition: the internal networks of TNCs' affiliates and the external networks of collaborative ventures with other companies (Tether, 2002; Laursen and Salter, 2004; Hagedoorn, 1993, 1996; Frenz and Ietto-Gillies, 2009). The latter work finds that companies' internal networks are more likely to contribute to innovation performance than their external ones.

At the same time, the acquired knowledge and innovation in each affiliate produces spillover effects to the local environment[5] via their external linkages. The double network (Hedlund, 1986; Hedlund and Rolander, 1990; Castellani and Zanfei, 2006: chapter 2) in which units of the TNC are involved – the internal network and the network of linkages

[5] Jaffe et al. (1993) in a study based on patent citations find that spillover effects are localized and fairly long-lasting.

with the local environments – has a positive impact on knowledge and innovation diffusion and acquisition at both the company and country levels.

Behind all this, there is the assumption that knowledge and innovation are more diversified between different countries than between regions of the same country.[6] This means that companies that operate in several countries have an advantage in terms of knowledge and innovation acquisition. Several theoretical and empirical studies seem to corroborate this perspective (Cantwell, 1989; Zanfei, 2000; Zahra et al., 2000; Castellani and Zanfei, 2006; Frenz and Ietto-Gillies, 2007, 2009).

Different theoretical approaches to the effects of internationalization on the spread of innovation are linked to different approaches to the determinants of international production. The theoretical explanations given by Vernon (1966) and by the evolutionary theory for why firms invest abroad are indeed different.[7]

What are the implications of this discussion for the dimensionality of our indices? If we base the analysis on the theory that TNCs learn from various environments and contribute to the development and diffusion of knowledge and innovations in such environments, then the geographic extensity becomes very relevant. Companies that locate in several countries would appear to have an advantage – in terms of knowledge acquisition and innovative potential – over companies confined to few countries.[8] Within the geographic scope, is the concentration dimension relevant? It could be. For example, it could be argued that concentration of activities – be they FDI or trade – in innovation-intense countries may facilitate learning and spread of innovation within the TNC across countries.

Nonetheless, some specific intensity indicators may also be considered relevant in the assessment of the impact of innovation: e.g. the ratios of imports of innovative products to GDP or of inward FDI in innovative industries to total FDI. It may be that we need indices

[6] Page (2007) argues that diversity of human resources has a positive impact on performance. The diversity of different geographic contexts is more inclusive and complex than the human resources one. Nonetheless, some of the arguments may apply.

[7] For a summary and critical analysis of the two theories see Ietto-Gillies (2005: chs. 5 and 12) and Forsgren (2008).

[8] However, there are also bound to be specific costs attached to multinationality (Hymer 1960; Zaheer 1997) and to operating in many countries.

of various geographic measures in order to capture the full impact of internationalization on innovation. In any case, we can conclude that our theories behind the effects on innovation have an impact on the choice of indicators for our indices.

7.2 Trade volume and structure

Trade is a specific internationalization mode and therefore researchers are often interested in the development and assessment of indices which measure the degree of internationalization related specifically to trade. These can be intensity indices in which trade variables are considered in relation to the size of the domestic economy (in the macro context) or in relation to the domestic sales or total sales of the company (in the micro context). It is also possible to develop *extensity indices* in which the number of countries/regions involved in trade becomes the main focus. Most often, it is the regional or countries' concentration of trade that is the focus of attention. In this case various measures of spatial distribution are used. Behind all these analyses are standard theories about the determinants of trade at the macro level or about the distribution of international markets and sales at the firm level.

However, trade effects can also come about via international production and therefore trade can be seen not only as a modality of internationalization in itself but also as a by-product of other internationalization activities, such as FDI or alliances. It is well known that international production and trade are closely related. TNCs contribute to trade directly and also indirectly via the impact of their direct production abroad through FDI (Cantwell, 1994; Ietto-Gillies, 2005: chapter 19). Over three quarters of world trade is initiated by TNCs and over a third of it takes place on an intra-firm basis (UNCTAD, 1996, 2002).

The volume of trade as well as the trade structure is affected by the scale and structure of international production. By trade structure, I refer to a variety of structural elements ranging from the type of transactions to the commodity composition and to the geographical composition of trade. The location strategies of TNCs' production affect the geographical structure of trade for countries and for the world as a whole. For example, the volume and the structure of FDI in China – particularly with regard to the type of activity and products in which inward FDI takes place – is having a major impact on the volume and structure of Chinese trade with the rest of the world. The volume and structure of FDI from non-EU countries – such as Japan or the United

States – in the United Kingdom affects the structure and volume of trade between the United Kingdom and the rest of Europe. This means that an analysis of the impact of international production and FDI on the geographical structure of trade may have to take account of intensity, extensity and concentration of both trade and FDI.

Moreover, in relation to the impact of FDI on trade, it has been argued that both domestic TNCs and foreign TNCs operating in a particular country may affect its trade volume and structure via their international production. This has led to the development of an intensity index of overall transnational activity which takes account of both inward and outward FDI as a ratio of the size of the domestic economy (Ietto-Gillies, 1989). This is a further example of how a specific theoretical approach to the impact of TNCs on trade influences the development of specific indices.

7.3 TNCs' bargaining power

The strategic behaviour of TNCs has been viewed from many angles. There is a large literature on the analysis of global versus multi-domestic strategies (Hout et al., 1982; Hamel and Prahalal, 1985; Ghoshal, 1987; Yip, 1989; Kogut, 1989). Moreover, the notion of strategic behaviour raises, among others, the question of "strategies towards whom?" Most literature on theories of the TNC and its activities, which takes a strategic rather than an "efficientist" approach,[9] focus on strategies towards rival companies (Vernon, 1966; Knickerbocker, 1973; Graham, 1978; Cowling and Sugden, 1987). However, TNCs also develop strategies towards other players with which they are involved, such as labour, governments and suppliers. In such strategies, their general aim is to cut costs and/or increase financial benefits.

With regard to labour, several strategies are open to the firm: e.g. the choice of technology; the location of production in low-cost countries; the adoption of a specific managerial and organizational system; seeking agreement with unions on the type of industrial relations acceptable prior to entry into a host country. A strategy that weakens the bargaining power of labour is outsourcing which can take place at the national or international level (Germidis, 1980; Ietto-Gillies, 2002: chapter 3). Some of the strategies are, in fact, open to any firm; others are specific to TNCs. The above strategies are not mutually exclusive.

[9] For a discussion of this issue and of the relevant literature see Ietto-Gillies (2005: chapters 9, 13 and 15).

Whatever the adopted strategy(ies) in dealing with labour, the level of the TNC's bargaining power is key to its success.

It has been argued (Ietto-Gillies, 2005: chapter 15) that TNCs are, ceteris paribus, in a better position than uni-national corporations when it comes to bargaining power towards other players and specifically towards labour and government. Having production activities spread over many countries is likely to give the TNC a greater bargaining power compared to uninational companies or to TNCs with activities in only one or two countries. This is essentially for two reasons. First, dispersing its activities over many countries fragments the labour force employed and makes it more difficult for them to organize and resist the demands of management compared with a situation in which all or most of the company's workforce is located in one or a few countries. This is all the more so as labour has been – so far – unable to organize itself across nation-states. The second reason is that a threat of relocation is more credible if the company already has facilities in several countries. Its management can then claim that it is easy to increase production in some of them and decrease it in the country where the unions are becoming too demanding.

The threat of relocation to other countries is often used not just towards trade unions but also towards regional or national governments with the aim of obtaining more favourable financial incentives, such as tax breaks. Yip (1989) argues that bargaining power towards labour, suppliers and governments can be increased by adopting global rather than multi-domestic strategies. Once again, the existence of a network of affiliates over many countries – or the ease of entry into new countries – may make the threats more credible. There are caveats to this approach. First the fact that geographical fragmentation in not the only strategy open to TNCs as mentioned above. Geographical diversification may, indeed, emerge not so much – or only – as a strategy specifically devised to increase bargaining power towards other actors but as an overall strategy designed to deal with a variety of objectives such as: market penetration; risk management; enhancement of competitiveness. Second, as regards labour, there are several specific strategies that corporations, including TNCs, can adopt as mentioned above.

Regarding strategies towards governments, diversification may enhance the power of TNCs in some cases. However, TNCs' bargaining power towards a government may also be enhanced by the ability to show evidence of a high degree of embeddedness in its country. The concentration of production in the country may be a starting point towards claiming embeddedness.

What is the relevance of this discussion for our choice of indices? If labour and/or governments in a country compete with their counterparts in other countries to attract FDI, then the TNC is likely be in a stronger bargaining position, the more it is geographically diversified and connected to other potential investment locations. Thus, whenever the geographic size of the network – in terms of number of countries of operations – is strategically important, extensity indices may become appropriate rather than intensity indices. On the other hand, evidence of embeddedness may be provided more by intensity or concentration indices.

There are also implications for the choice of indicators; employment data – as well as output data – may be more relevant whenever the researcher is interested in issues related to bargaining power with labour. The level of FDI may be considered more relevant in the case of bargaining power with governments.

7.4 Performance indicators

Performance can be considered at the macro, micro or meso level. At the firm level, the ultimate and simplest indicator of performance may be profits. However, even this simple indicator is not without problems and ambiguities. For example, over what period of time, do we measure profitability? The strategies and the elements leading to growth in profitability over different time periods are not the same.

There are several means of enhancing profits. At the company level, this can be done by reducing costs or by increasing revenues. Innovation and trade considered above can be viewed as performance indicators at both the micro and macro levels: they affect costs, competitiveness and markets. Bargaining power towards labour and/or governments is a means of reducing certain costs, such as labour costs or tax liabilities.

Geographical diversification[10] may be part and parcel of a strategy of production flexibility (Kogut and Kulatikola, 1994) aiming to achieve lower costs or to access wider markets. It may also be part of a risk management strategy (Ghoshal, 1987; Yip, 1989) which decreases the probability of higher costs in the long run. The risks can be in relation to a variety of events that affect costs, ranging from natural disasters to currency fluctuations to disruption of productions flows. Whenever

[10] Diversification by countries seems to be also a strategy attractive to shareholders. Agmon and Lessard (1977) find that investors recognize - and react positively to – international diversification when acquiring equities.

geographical diversification is relevant for performance effects, then the use of extensity indices may be the correct approach to work with.

The degree of embeddedness of companies in the home country may be relevant both in the case of countries' performance and in the case of performance of a single TNC. In this case, the use of intensity indices may be appropriate.[11]

8. Summary and conclusions

The paper identifies four main research contexts on internationalization related to: the level of aggregation, internationalization modes, activities configuration and other elements of internationalization at the firm level. This is followed by the identification of three geographic measures of internationalization: intensity, extensity and concentration. A section on issues related to the construction of indices considers uni- versus multi-variables indices; simple versus composite (average of several uni-variable indices) and complex indices. The latter combine two or three geographic measures together. A consideration of choice of indices open to researchers is followed by a discussion of the effects and how they and the underlying theories should drive the search for appropriate indices. Four examples of the links between theoretical approaches to analyse the effects and the development of indices are considered.

The following conclusions can be drawn from the overall discussion. First, the degree of internationalization is not a unique concept because internationalization has many facets and can be looked at from many perspectives and in many research contexts. Therefore, there is no "correct" index; the appropriateness of indices depends on the tasks we assign to them. Second, the main use of indices is as guide to assessing the effects of internationalization with a view to developing strategies and policies at the firm or macro levels. Third, it follows that the theoretical and conceptual framework behind the effects we wish to analyse should be the main driver in the search for appropriate indices. Fourth, the appropriateness is determined by the choice of measures (intensity, extensity or concentration), the choice of context and of specific variable(s) within them and to the choice of construction techniques.

[11] Dunning (1996), in a survey of 144 of the largest industrial firms, finds that their degree of transnationality – measured by an intensity index – impacts positively on their competitive advantages.

Some authors (e.g. Rugman and Oh, 2008) have strongly come out in favour of a specific type of indices – intensity indices – as the only possible dimension for indices of internationalization. This is because, as they put it, "The scope measure adds little value to our understanding of the extent of multinationality" (Rugman and Oh, 2008: 10).[12] The implication is that there is a unique concept of internationalization, contrary to the arguments of the present article. I acknowledge that the availability of data required for measures of extensity is very unsatisfactory. However, this is a reason for pressing for better data, and not for dismissing the whole concept. We must distinguish between the appropriateness of concepts and the availability and quality of data related to those concepts.

The conclusion to be drawn from discussions in the present paper is that, for some tasks, intensity indices are better than extensity ones; for others, the reverse is true. In many cases, both or a combination of them may turn out to be useful. Whenever geographical diversity is conceptually important, then extensity indices are appropriate. Whenever a specific country is the focus of attention – such as the home country – then intensity indices may be called for. Concentration indices seem appropriate when the distribution of activities within a region is relevant for assessing effects.

Similarly, with regard to the choice between complex and simple indices, in general, I would favour simplicity over complexity. However, in some cases composite or complex indices may be appropriate provided that the underlying theoretical assumptions are clear and consistent with the way the index is developed and constructed.

The analysis and interpretation of empirical results from indices also requires considerable caution. In particular, it should take account of the following. First, the explicit or implicit assumptions made in the development and construction of the index. An example on this issue is given by Fisch and Oesterle (2003). In the construction of their interesting and sophisticated indices, they use GDP as a measure of market size and seem to assume that the only motive for foreign investment is the search for markets. Yet, we know that a large amount of FDI is undertaken for supply/production reasons, i.e. reasons linked to availability of cheap labour, skills or materials.

Second, any additional qualitative information available should be considered when interpreting the results. For instance, in many intensity

[12] In the quotation the word "scope" refers to geographic extensity.

indices that use employment data at the firm level, one may find that the index may not increase or even decline over time. It would be unwise to interpret this as a sign that the firms' foreign activities are declining. A look at the organization of production may give a different picture; the company may have increased its international outsourcing. This may equally apply to the establishment of foreign affiliates which may have been substituted by the establishment of new firms as subcontractors while the TNC retains strategic power (Cowling and Sugden, 1987, 1998) over the whole value chain.

Third, though each index can give useful comparisons across firms or countries and/or time, different indices may not be fully comparable because of different scales and different normalizers.

Fourth, composite or complex indices that combine different sub-indices or dimensions of internationalization may be more difficult to interpret than simple, uni-variable and uni-measure indices.

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A proposal to improve UNCTAD's inward FDI potential index

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In the literature of foreign direct investment (FDI) and international business, an increasing attention is being paid to the comparative study of countries' attractiveness for FDI. The United Nations Conference on Trade and Development has developed several indices to evaluate and compare the location advantages of the countries and their relative success in attracting FDI. However, these indices suffer from several limitations. We have constructed an improved inward FDI potential index that can solve some of those limitations, making use of 70 variables for 49 countries and data reduction techniques. The correlation analysis shows that it fits better with the Inward FDI Performance Index, and thus this new index explains more precisely countries' FDI inflows. Moreover, the larger number of variables included allows us to rank the countries for different kinds of FDI and to assess countries' strengths and weaknesses for policy purposes.

Keywords: transnational corporations, location determinants, synthetic indices

JEL: C43, F21, F23

1. Introduction

In recent editions of the *World Investment Report* (*WIR*), the United Nations Conference on Trade and Development (UNCTAD), like other think tanks, have been undertaking international benchmarking in their analysis and policy recommendations.[1] The UNCTAD has constructed two indices: the Inward FDI Potential Index and the Inward FDI Performance Index to evaluate and compare the location advantages of countries and their relative success in attracting FDI.[2]

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[1] UNCTAD is not the only institution that evaluates world FDI using indices. Some examples are the "FDI Sustainability Index" elaborated by the Economist Intelligence Unit, or the "FDI Confidence Index" elaborated by A.T. Kearney (2003). In Christiansen (2004), there is information about the variety of international benchmarking indices regarding business climate in general.

[2] In *WIR 2004*, UNCTAD has included the Outward FDI Performance Index. This index tries to capture two aspects: the "ownership advantages" of the firms in the investor country and the "location advantages" of the host country (UNCTAD, 2004).

Despite the obvious relevance of these indices and its contribution to the analysis of FDI, UNCTAD recognizes the limitations of its indices. In *WIR 2002*, UNCTAD accepted that "It is not possible, with the available data, to capture the host of factors that can affect FDI" (UNCTAD, 2002, p. 23) and that "This analysis can offer many interesting insights for FDI analysis and policy. However, the indices are still at a formative stage. There is much that can be done to improve, broaden and deepen them, in particular the Inward FDI Potential Index. It does not include a number of factors that are known to affect international investment flows, and there may be more appropriate variables that could replace some of those now used; the problem is, of course, to obtain satisfactory quantitative data for a large number of countries. It is hoped that this constraint will, at least in part, be relieved over time" (UNCTAD, 2002, p. 32). However, since then, UNCTAD is using these indices, although with minor changes, making no mention of their limitations.[3]

The purpose of this paper is to make a modest progress to address the problems acknowledged by UNCTAD, by constructing what we call Improved Inward FDI Potential Index (IIFPOI), which we believe approximates more closely what is required in terms of both explaining the distribution of worldwide FDI flows and helping to design policies to attract not only overall FDI inflows but also specific kinds of FDI. The paper is structured as follows. Section 2 sets out the criteria used to choose variables for this IIFPOI. Next, we explain the construction of the proposed index (variables, sources and methodology). In section 4, a number of results using this new potential index are presented with possible ways for future improvements. Final section concludes.

2. Criteria for constructing an improved index

The choice of the variables included in IIFPOI is justified by the following criteria: the theoretical analysis of the determinants of FDI; the empirical studies testing the validity of the theoretical analysis; the availability of quantitative data on the potential determinant factors and their geographic scope; and finally, the correlation between these criteria and IIFPI.

[3] *WIR 2003* (UNCTAD, 2003) includes four new variables into the potential index: shares of world exports of natural resources, share of world imports of parts and components of electronic and automobile products, share of world exports of services, and the share of the world stock of Inward FDI. However, the *Report* does not mention their inclusion, and the justification for their inclusion only appears in the methodological section on the UNCTAD website.

Since the aim of this index is to be a useful tool for analysing the relative advantages of countries for FDI inflows, we adopt Dunning's eclectic paradigm as theoretical framework. This paradigm encompasses, as location advantages, a wide range of factors, including those related to policies regulating FDI (and policies that affect FDI indirectly), those of an economic nature, and those related to the "climate" in which foreign investors operate in host countries. Dunning (1993) provides a long list of factors that may be considered as determinats. In *WIRs* (UNCTAD, 1998a and 2001), these same factors are included, ordered according to the main objectives that transnational corporations (TNCs) seek when they invest abroad. In these works, mainly in *WIR 1998,* an extensive review of empirical studies on the determinants of FDI inflows is undertaken.[4] The synthesis of all the literature is that the most significant variables are those related to market-seeking and resources-seeking FDI (in the case of the less developed countries) such as GDP, income per capita, labour costs, etc.

These are "traditional" determinants, but the current globalization process is likely to induce important changes to location determinants (UNCTAD, 1996). The theoretical argument for explaining these changes is that technological advances, increasing openness to trade, FDI and technology inflows, and the subsequent competitive pressure on firms, would result in a reconfiguration of the strategies pursued by TNCs to achieve their objectives (resources-, markets- and efficiency-seeking FDI). The two possible consequences on the location determinants are: first, host countries would be assessed by TNCs on the basis of a wider set of variables than before; and, second, the relative importance of FDI determinants would be rebalanced.[5] Although the "traditional" economic determinants and the type of FDI associated with these would not disappear, their relevance is likely to decrease, giving a greater weight to the determinants related to efficiency-seeking and created assets-seeking FDI.

[4] Most of these studies do not include variables that represent determinants of a political-institutional nature.

[5] The globalization and liberalization of the world economy would have extended the policy framework of FDI to other policies that in the past were not considered as FDI determinants (macroeconomic, regional, technological and labour policies, and even those that can affect the human capital such as education and health policies). Nevertheless, this framework, although wider than before, will continue to work as a set of location determinants subordinated to those of an economic nature. Policies designed to generate an investment friendly environment and pro-active measures to facilitate business activity for foreign investors (promoting FDI, financial/fiscal incentives, less "hassle costs", etc.) are not new, but they are increasingly more common and will thus be taken more into account by TNCs.

With those arguments in mind, Dunning (2002) reviews the new (1990/2000) and the old (1970/1980) determinants of FDI arguing the following:

- In the case of FDI flows between developed countries, the traditional determinants are those related to market-seeking FDI. More recent emerging determinants are concerned with created assets-seeking FDI (to acquire or modernize the competitive advantages) and the factors related to "business facilitation" (mainly the business framework and the public regulation related to competition, innovations and international M&A policies). Other important economic determinants arising from the liberalization of markets and the regional integration are those related to horizontal efficiency-seeking FDI.

- In the case of FDI flows from developed countries to developing countries (and, to a lesser extent, between developing countries), there are two main kinds of FDI. One is the traditional market-seeking and resource-seeking FDI, which together account for about 70% of FDI inflows in developing economies, with Brazil, China, Hong Kong (China) and India being the main destinations. The other type of FDI is classified as "efficiency-seeking FDI". For this type of investment, the objective of the TNC is to produce intermediate or final goods in locations with the lowest costs for their subsequent export to third markets. Here, TNCs pay more attention to variables related to efficiency-seeking FDI and to the FDI policy framework. Currently, such investment is mainly concentrated in South Asia, South-East Asia and Mexico.

As a result of this theoretical development and the greater availability of data, a series of studies testing these changes emerged. These studies include old and new determinants, but they have not reached a consensus about these shifts.[6] One of the initiators of these new studies is UNCTAD, who provides an econometric annexes for the (partial) verification of its theoretical postulates (UNCTAD, 1998a). Results show, first, that the capacity of traditional determinants to explain the worldwide distribution of FDI inflows declined over the period under analysis (1990–1995) and, second, that the incorporation of the "political stability" variable into the regression model improves the capacity to explain FDI flows, mainly for developing countries. This

[6] These studies use econometric methods based on multiple regression analysis for cross-section data or discriminating analysis using corporate surveys.

is interpreted by UNCTAD as a sign that institutional characteristics of the countries have a positive influence on FDI inflows.[7]

Recent studies concur with the findings of UNCTAD. Stein and Daude (2001) find that the "quality of institutions", as defined by the Governance Indicators of the World Bank, has positive effects on FDI. Globerman and Shapiro (2002) conclude that, for the period 1995–1997, the attractiveness of a country (for both developed and developing countries) is strongly conditioned by "National Political Infrastructure"[8]. Moreover, although the Human Development Indicator is not a significant indicator, the level of education is important. Busse and Hefeker (2005) find that the 12 indicators used to proxy political risk have a significant negative impact on FDI inflows. Regarding the institutional framework, Bengoa and Sánchez-Robles (2003) find, using panel data for 18 Latin American countries over the period 1970–1999, that economic freedom (as defined by the Fraser Institute Index) in host countries is a positive determinant of FDI inflows. Addison and Heshmati (2003) conclude that the wave of democratization[9] and, mainly, the spread of technologies of information and communication[10] positively affect FDI inflows in developing countries. Asiedu and Lien (2004), in a study of 96 developing, transition and emerging economies, that almost all the indicators for capital control have a significant negative effect in a fixed panel specification.

However, Nunnenkamp (2002) questions whether a change in the relevance of determinants amongst developing countries has really taken place. Using data from a survey of companies[11] including 33 questions on a set of economic and political factors related to FDI in 28 developing countries, he concludes that between 1987 and 1999, no important changes took place regarding location determinants. The traditional determinants related to host markets (population and GDP per

[7] UNCTAD does not explain two related questions. First, the choice of variable used as a proxy for the political stability of the countries. Second, the reason to include in its potential index (UNCTAD, 2003) a risk-country variable as a proxy for the political-institutional framework, because these variables measures not so much the political risk as the economic-financial risk.

[8] This measure is proxied by the first main component of the six Governance Indicators of the World Bank.

[9] As calculated by the democratization index: average of degree of political competition (representation of minorities in the parliament) and participation of the population in elections.

[10] Proxied by total expenditure on information and communication technologies, equipment and services as percentage of GDP.

[11] This is a annual survey on companies forming part of the European Round Table of Industrialists (2000 edition).

capita) are still dominant, and the only new determinant with a higher relevance is the skill level of the labour force. Noorbakhsh et al. (2001) also conclude that human capital is a statistically significant determinant of FDI inflows, having a growing relevance, and that other traditional variables (the growth of the domestic market, a stable macroeconomic situation, liberalization policies, a sustaining business framework, etc.) are also significant. Chakrabarti (2001) also reject the hypothesis of a change in the determinants, and argues that the market size and the degree of openness of the host country are more stable than other determinants (wages, net exports, rate of growth, taxes, trade tariffs and exchange rates).

Other studies have analysed whether bilateral investment treaties (BITs) and double taxation treaties (DTTs) are a significant determinant of the attractiveness of a country for foreign investors. UNCTAD (1998b) analysed the impact of 200 BITs on bilateral FDI with cross-section data for 133 countries in 1995, concluding that they do not play a very important positive role. Hallward-Driemeier (2003), making an econometric study of bilateral flows in the OCDE countries over a 20 year period, concludes that there is no solid evidence that BITs stimulate additional FDI flows, although they would act as complement to the institutional framework of the target country by offering sufficient guarantees on property rights to foreign investors. However, Banga (2003), analysing 15 Asian countries using a panel data analysis, concludes that BITs play a significant positive role.[12] Although there are a large number of studies on the effects of taxation on FDI, this is not the case of DTTs. Blonigen and Davies (2001) conclude, by making a regression analysis of bilateral inflows of FDI between the United States and 65 countries, that these treaties do have a positive impact on FDI in the medium and long term.[13]

In table 1, we summarize other studies on the determinants of FDI. It shows that research is finding a diverse set of determinants as new developments in the global economy take place and data availability and econometric techniques evolve. In sum, the findings in the vast empirical literature regarding location determinants justify our approach to include the largest possible number of variables related to the location determinants in constructing our improved index, IIFPOI. All in all, and despite some mixed results regarding some variables, empirical studies

[12] He found a negative effect for tariffs and restrictions on foreign capital ventures.

[13] The positive effects are on inflows and outflows, sales and employment both in host and home countries.

Table 1. Some Other Cross-Country Studies about FDI Determinants

Authors	Y	Method	Control Variable	Xi	Period/Countries
Newmayer & Spess, 2005	Log FDI flows in constant terms	Panel Fixed and Random Effects	LogGDP per capita (+) Log Population (+) GDP Growth (+) Inflation (-) Income Natural Resources/GDP (+) Political Constrain Index (0) Composite Political Risk (-) Sub-indices (mainly -)	Number of BITs (+)	1970-2001 and sub-periods 120 countries
Moosa & Cardak, 2005	Unctad FDI perf. Index	Extreme Bond Analyses	13 from UNCTAD Potential Index	Only robust: GDPPC (+) X/GDP (+) Phones (+)	1998-2000 140 countries
Egger & Winner, 2005	Log FDI stock	Panel Fixed Effects/ Hausmann Taylor	Log GDP (+) LogSchool (0)	Corruption:3 Kauf. Subin.(+)	1995-1999 73 DC&LDCs
Alsan, Bloom & Canning, 2004	Log FDI flows	OLS	LogPop (+) LogGDPPC (+) Openess (+) Burocracy Qual. (+) Corruption (- for LDCs) Phones (0) Dsitance (0) Landlocked(0)	Health: Life Expectancy (+)	74 miscellaneous; 1980-1990 1990-2000
Hasnat, 2003	Log FDI flows	OLS	LogGDP (+) GDPGrowth (+) LogOpeness (+)	Labour Standards: Nº of ratified conventions (0)	1995-1999 142 countries
Asiedu, 2002	FDI/GDP	OLS & Panel	Openess (+) Phones (+) 1/GDPPC (proxy Capital return) (+) Public Exp/GDP (0) Infla (0) M2/GDP (0)	SubSaharian Africa Dummy (-)	1988-1997 71 LDCs
Morisset, 2000	FDI inflows	OLS & Fixed Eff.	GDP (+) Nat. Resources (+) Openess (+ in panel) Illiteracy (0) Phones (0) Urban Pop (0)	Pol. Risk-ICRG (0) Financial Risk –Insti. Investors (0)	1990-1997 29 SubSaharian
Fernández-Arias & Hausmann, 2000	Log(FDI/ GDP+1)	OLS	LogGDPPC (+ alone) LogGDP (0) LogX/GDP (+)	One by one GDP volat. (0) Suboil Resou (0) Distance (+) Credit/GDP (0) 5 Kaufman Indices (+ majority)	1997 All Countries
Gastanaga, Nugent & Pashamova, 1998	FDI/GDP	OLS & Fixed Effects	GDP Growth (+) Oil Price	Mainly Sig in Panel Data Ex rate distor (Black Market Premium) (0) Openess Capital Flows in General (+) Openess to FDI (+) Corp. Tax Rates (-) Tariffs (+ in OLS, - panel) National. Risk (-) Contract Enforcement (+) Buroc. Delay (-) Corruption (-)	1970-1995 23 LDCs

Source: Authors' own compilation.
(+), (-), (0) means positive, negative or insignificant effect

confirm the need to adopt an inclusive approach to search for a synthetic FDI potential index.

At this point, however, we must stress that the number of variables included in an index of this nature is constrained by the availability of data. We must stress that the UNCTAD's decision to include only 13 variables in her potential index is not guided by this restriction, although it is proposed as such.[14] Furthermore, the difficulty in quantifying some qualitative determinants related to the political and institutional framework, which UNCTAD cites as the reasons for their omission in its index, is a problem which can be solved, as most of the above mentioned studies do, with indicators produced by a number of bodies. However, this solution involves that, with the data available at the time of writing, we cannot include all countries in the world, and, therefore, there is a trade-off between geographical scope and the depth of analysis. For this paper, we opted to improve the quality of the index, leaving aside the issue of limited geographic scope. This option allows our index to fulfil better than the current UNCTAD's potential index the objectives of being a tool, first, to evaluate the countries' competitiveness to attract certain kinds of FDI inflows, and, second, to design policies to improve, or change, the location advantages of host countries.

An additional question which we must mention is, that for the inclusion of the variables making up the index that we have constructed, we have not considered (in a way similar to UNCTAD, 2002: table II.4) the correlation between those variables and the Inward FDI Performance Index (IFPEI). However, as the previous literature review shows, the variables selected are grounded in the theory and in some cases in empirical findings.

3. Variables, sources and methodology

We have included a total of 70 variables in our index, IIFPOI, for a set of 49 countries (those included in the World Competitiveness Yearbook 2003) with different levels of economic development and belonging to different geographical zones. Sources used to obtain the data were UNCTAD (2003), the governance indicators by Kaufmann et al. (2003), the International Institute of Management Development (2003), the World Economic Forum (2002/2003) and the Fraser Institute (2003).

[14] In *WIR 2002* (UNCTAD, 2002, table II.4: 35) many other variables are taken on board (commercial policy, regulation of FDI, numbers of BITs and DTTs, etc.) for which, indeed, there does seem to be data on the 140 countries in question.

Table 2. Variables included in the Improved Inward FDI Potential Index

			Host country determinants		
			I. Policy framework for FDI		
	• economic, political and social stability				
Factor 1	2	Country Risk	Composite risk	UNCTAD	December 2001
	3	Macroeconomic environment index		GCR	2001
	4	Political Stability		Kaufman	2000
	5	Risk of Political Instability	very high very low (SURVEY)	IMD	
Factor 1	6	Exchange Rate Stability	Parity change from national currency to SDR, 2002/2000	IMD	2000
	• rules regarding entry and operations				
Factor 2	7	Access to Foreign Capital		EC FREEDOM (GCR)	2001
	8	Restrictions on Foreign Capital Transactions		EC FREEDOM (IMF)	2001
	9	Public Sector Contracts	are not sufficiently open to foreign bidders or yes (SURVEY)	IMD	
	• standards of treatment of foreign affiliates				
	10	CROSS-BORDER VENTURES	cannot be freely negotiated with foreign partners or yes (SURVEY)	IMD	
	11	FOREIGN INVESTORS	are not free to acquire control in domestic companies or yes (SURVEY)	IMD	
	12	FOREIGN FINANCIAL INSTITUTIONS	do not have access to the domestic market or yes (SURVEY)	IMD	
	13	ACCESS TO LOCAL CAPITAL MARKETS	is restricted for foreign companies or not (SURVEY)	IMD	
	14	FOREIGN COMPANIES	are discriminated against by legislation or not (SURVEY)	IMD	
Factor 2	16	Investment protection schemes (against nationalization, expropriations, etc.)	are not available for most foreign partners or yes (SURVEY)	IMD	
	• structure of markets specially competition and M&A policies				
Factor 3	15	Competition legislation in your economy	is not efficient in preventing unfair competition or yes (SURVEY)	IMD	
	52	Patent and copyright protection	is not adequately enforced is adequately enforced (SURVEY)	IMD	
	• privatization policy				
	• trade policy (tariffs and NTBs) and coherence of FDI and trade policies				
	18	Taxes as Percentage of Exports & Imports		EC FREEDOM (IMF)	2001
	19	Mean Tariff Rate		EC FREEDOM (WDI)	2001
	20	Variability of Tariff Rates		EC FREEDOM (WDI)	2001
	21	Hidden Import Barriers		EC FREEDOM (GCR)	2001
Factor 3	22	Costs of Importing		EC FREEDOM (GCR)	2001
	• tax policy/international agreements on FDI				
	17	BITs & DTTs signed		UNCTAD	2001
	23	Average Corporate Tax Rate on Profits	Percentage of profit before taxes %	IMD	2001

Table 2. Variables included in the Improved Inward FDI Potential Index (continued)

			III. Business facilitation		
	• investment promotion				
	• investment incentives				
	24	Investment Incentives	are not attractive to foreign investors or yes (SURVEY)	IMD	
	25	GOVERNMENT SUBSIDIES	To private and public companies as a percentage of GDP	IMD	
	• hassle costs (related to corruption, administrative efficiency, etc.)				
Factor 4	26	Control of Corruption		KAUFMAN	2001
	27	BRIBING AND CORRUPTION	exist in the economy do not exist (SURVEY)	IMD	
	31	Irregular Payments to Government Officials		EC FREEDOM (GCR)	2001
	28	Administrative Obstacles for New Businesses		EC FREEDOM (GCR)	2001
	29	Time Spent with Government Bureaucracy		EC FREEDOM (GCR)	2001
	30	Ease of Starting a New Business		EC FREEDOM (GCR)	2001
	33	EASE OF DOING BUSINESS	is not a competitive advantage for your economy, is it (SURVEY)	IMD	
Factor 4	32	BUREAUCRACY	hinders business activity does not hinder business activity (SURVEY)	IMD	
	• social amenities (bilingual schools, quality of life, etc.)				
	73	QUALITY OF LIFE	Quality of life in your economy/society is low/high (SURVEY)	IMD	
	• after-investment services				
			II. Economic determinants		
			Type of FDI classified by motives of TNCs (Principal economic determinants in host countries)		
A. Market-seeking					
	• market size and per capita income, market growth				
		34 GDP growth %		UNCTAD	Average 1999-2001
		35 GDP per capita		UNCTAD	
		74 % world FDI stock		UNCTAD	Average 1999-2001
	• access to regional and global markets				
	36	Integration into regional trade blocks	does not provide enough access to foreign markets, or does it (SURVEY)	IMD	
	37	Total exports	As % of GDP	UNCTAD	Average 1999-2001

Table 2. Variables included in the Improved Inward FDI Potential Index (continued)

	• country-specific consumer preferences				
	• structure of markets				
B. Resource seeking					
	• raw materials				
	38	Exports Natural resources	% world total	UNCTAD	Average 1999-2001
	• low-cost unskilled labour				
	39	Total hourly compens. for manuf. workers	(wages + supplementary benefits), US$	IMD	2002
Factor 5	40	LABOR REGULATIONS	are not flexible enough are flexible enough (SURVEY)	IMD	
	42	Flexibility in Hiring & Firing		EC.FREEDOM (GCR)	2001
Factor 5	43	Collective Bargaining		EC.FREEDOM (GCR)	2001
C. Asset-seeking					
	• skilled labour				
Factor 6.1.	44	SKILLED LABOR	is not readily available is readily available (survey)	IMD	
	45	FOREIGN HIGH-SKILLED PEOPLE	are not attracted by the business environment of your country or yes (SURVEY)	IMD	
Factor 6.1.	50	INFORMATION TECHNOLOGY SKILLS	are not readily available are readily available (SURVEY)	IMD	
	• tech. Innovatory and other crated assets (brand names), including as ...				
Factor 6.2.	47	SECONDARY SCHOOL ENROLLMENT	Percentage of relevant age group receiving full-time education	IMD	
	46	Students in tertiary level	As % of total population	UNCTAD	
	49	R&D	expenditures as % of GDP	UNCTAD	
	51	PATENTS GRANTED TO RESIDENTS	Number of patents granted to residents (average 1998-2000)	IMD	
	53	NUMBER OF PATENTS IN FORCE	Per 100,000 inhabitants	IMD	
Factor 6.2.	54	Technology index		GCR	
	•physical infrastructure				
Factor 7.2.	55	ROADS	Density of the network (km per square km)	IMD	
Factor 7.2.	56	RAILROADS 2001	Density of the network (km per square km)	IMD	
Factor 7.1.	57	QUALITY OF AIR TRANSPORTATION	Deters business development in your economy or not (SURVEY)	IMD	
	58	WATER TRANSPORTATION	does not meet business requirements or yes (SURVEY)	IMD	
	59	DISTRIBUTION INFRASTRUCTURE	The distribution infrastructure (roads, trains, planes, etc.) of goods and services is in general good or bad (SURVEY)	IMD	
	64	Telephone mainlines	Per 100,000 inhabitants	UNCTAD	Average 1999-2001

Table 2. Variables included in the Improved Inward FDI Potential Index (concluded)

Factor 7.1.		65 Mobile	Per 100,000 inhabitants	UNCTAD	Average 1999-2001
D. Efficiency-seeking					
	• cost of resources and assets listed under B, adjusted for productivity for labour resources				
	6234	Average of working hours*hourly compensation for manufacturing/GDP per person in industry (US$)			
	• other input costs, e.g. transport and communication costs to/from and within host economy and costs of other intermediate products				
Factor 8.2.	60	INTERNATIONAL FIXED TELEPHONE COSTS	US$ per 3 minutes in peak hours to USA (for USA to Europe)	IMD	
	61	ELECTRICITY COSTS FOR INDUSTRIAL CLIENTS	US$ per kwh	IMD	2002
	72	Adequacy of communications (availability, reliability, cost) is generally	low in your economy high in your economy (SURVEY)	IMD	2003
Factor 8.2.	66	Commercial	energy use per capita	UNCTAD	Average 1999-2001
Factor 8.1.	67	COST-OF-LIVING INDEX (New-York City=100)	Index of basket of goods & services in major cities, excluding housing	IMD	
	68	APARTMENT RENT	3-room apartment monthly rent in major cities, US$	IMD	
Factor 8.1.	69	OFFICE RENT	Total occupation cost (US$/Sq.M per year)	IMD	
Factor 8.3.	70	Imports of parts/accessories of electronics and automobile	% world total	UNCTAD	Average 1999-2001
Factor 8.3.	71	Exports in services	% world total	UNCTAD	Average 1999-2001
	• membership of a regional integration agreement conducive to the establishment of regional corporate headquarters				

Source: Authors.

To construct the index, we have selected from these sources (besides those of the UNCTAD index itself) those variables that might serve as best proxies for the location determinants. These variables have been ranked according to the typology shown in table 2. The 70 variables have been grouped by categories: FDI policy framework (23 variables), business facilitation (11) and economic determinants (five for market-seeking FDI, five for resource-seeking FDI, 16 for created assets-seeking FDI and ten for efficiency-seeking FDI). The variables can be divided into "hard data" and "soft data" group. The first group, published by conventional international bodies, mainly refer to quantitative economic variables, while "soft data" are qualitative data based on surveys. The use of "soft data" was reduced to a minimum because their methodology is considered less rigorous. Nevertheless, they are irreplaceable if one wishes carry out analysis of location determinants of a qualitative nature, like many of those related to political-institutional framework.

Since many of the variables showed high correlation among them, mainly those belonging to the same type of determinants, a Principal Component Analysis was applied in an iterative manner and in a different order, depending on the economic sense of the extracted factors. The purpose of this analysis was to simplify the construction of the index, reducing the number of variables as much as possible with the least loss of information.[15]

[15] The rotation method employed to extract the factors was Varimax Normalization with Kaiser and the statistical criteria used were auto-values higher than 1, rejection of factors if Meyer-Oklin test is lower then 0,6 and/or Kaiser and Bartlett test significance higher than 0,05. We substituted missing values by the mean because this is the suggested criteria when there are few missing cases. We used the Comrey criteria for factor adjustments. When a variable does not show a clear belonging to a factor we face complex variables. They do not contribute to identifying the nature (interpretation) of the factors in which they have their principal weights. The best option is to withdraw them (so the explained variance improves and is easier to interpret). Besides, when a factor is highly correlated with only one variable, it is considered that it is insufficiently defined. It is than convenient to make a new analysis with one factor less. Another criterion to construct factors has been the economic sense of the variables grouped by principal components. If the aggregation of variables does not have a meaning it has been also rejected. With the 70 variables (hard and soft) considered we tried to perform a factor analysis by principal components with all of them together. The factors extracted were rejected because of some of the above criteria were not meet. We then performed factor analysis by broad groups (I, II and III of Table 2) and it was also rejected. We then performed the analysis by subgroups (in II "economic determinants" by A,B,C and D) and we rejected the factor extraction. Finally, we obtained 12 factors and 13 variables.

The application of this technique resulted in the selection of 12 factors and 13 variables. Nine factors and variables are related to the institutional framework for FDI (five to FDI policy framework and four to business facilitation) and 16 to economic determinants (five to market-seeking, three to resource-seeking, four to efficiency-seeking and four to asset-seeking FDI). We believe this is a rather balanced structure, giving more weight to the economic determinants, consistent with the greater importance that they should have. With these 25 determinants, after normalizing the values, the new potential index was constructed as a simple average (see table A.1 in the appendix for the scores of the different factors and variables). The normalization was carried out applying the formula (Vi-Vmin)/(Vmax-Vmin), or (Vi-Vmax)/(Vmin-Vmax) in the case that the variable is a location disadvantage.[16]

This procedure is similar to that used by UNCTAD. Nevertheless, we wish to make two observations. The first is about the use of the simple average. A weighted index could be justified depending on the importance that can be attributed *a priori* to those groups. A lower weight (the same for all countries, developed or not) might be assigned to political-institutional determinants than to economic ones. Moreover, according to Dunning (2002), the determinants related to market-seeking FDI, etc., could be weighted according to the level of development of the countries assigning, for example, a higher weight to the created asset variables in developed countries than in developing countries.

The second observation is concerned with the normalization of the variables. Neither maximum nor minimum ad hoc values have been fixed for any of the variables. This procedure may have a perverse statistical effect if a country strongly deviates from the average in some variable. In this case, the values of other countries, even if they are significantly different, show a normalized value very similar to one another, as a result of which the relative advantage of country with respect to the rest becomes blurred for this variable. Another problem of a normalization without maximums or minimums is that the index cannot increase or worsen in all countries with the passage of time and, therefore, the interpretation of changes only makes sense in relative terms to the evolution of the maximum and minimum value.

[16] The variables considered as location disadvantages are: exchange rate instability, average corporate tax, total hourly compensation for manufacturing workers, unit labor costs in manufacturing, telephone costs, electricity costs, cost of living, apartment rent and office rent.

4. Results and comparison with UNCTAD's model

The following indices are used for comparison:

- Improved Inward FDI Potential Index (IIFPOI);
- Inward FDI Potential Index of UNCTAD for 140 countries (IFPOIUN140);
- Inward FDI Potential Index of UNCTAD, re-caluclated for the 49 countries in our sample (IFPOIUN49);
- Reverse ranking of the Competitiveness Index of Global Competitiveness Report (GCR);
- World Competitiveness Yearbook (WCY) Index; and
- Economic Freedom Index (ECFREE).

The rankings of the 49 countries in the different indices are quite similar (table A.2 in the appendix).[17] Our index, as shown in table 3, has a high correlation with all indices, since we have used data from all of them.[18]

Table 3. Spearman's correlation coefficients

	IIFPOI	IFPOIUN49	IFPOIUN140	GCR	WCY	ECFREE
IIFPOI	1	0,866	0,849	-0,88	0,88	0,855
IFPOIUN49	0,866	1	0,992	-0,915	0,792	0,808
IFPOIUN140	0,849	0,992	1	-0,901	0,786	0,792
GCR	-0,88	-0,915	-0,901	1	-0,88	-0,89
WCY	0,88	0,792	0,786	-0,88	1	0,828
ECFREE	0,855	0,808	0,792	-0,89	0,828	1

Source: Authors.
* All the correlations are significant at 1% level

The indices that present a ranking more similar to each other – apart from IFPOIUN49 and IFPOIUN140 – are the GCR index and IFPOIUN49 (0.915). However, our index has a lower correlation with the GCR index (0.880). This can be interpreted as validating our index, since there is not another index that produces the same ordering of potential FDI attractiveness. It could be argued that the index by

[17] This is not surprising since the GCR and the WCY are 'competitiveness' indices, a vague concept which involves the attractiveness of the socio-economic conditions of a country for business (investment) in general, both national and foreign.

[18] In both indices the countries included in the top-10 are the same ones. This coincidence is lower in the case of the bottom-10, where 4 countries do not appear in the UNCTAD index.

UNCTAD is more dispensable since it produces an ordering much more similar to that of the GCR index, which has been regularly published for some time now.

Table 4. Dependant variable: Inward FDI Performance Index, IFPEI (1999-2001)

model	1	2	3	4	5
constant	-2,547**	-0,21	-1,862	-0,288	-4,079**
IIFPOI	9,241*				
IFPOIUN49		4,816**			
GCR			0,747***		
WCY				0,033*	
ECFREE					0,823*
R^2	0,268	0,128	0,064	0,189	0,165
F	17,17	6,912	3,213	10,982	9,32
N	49	49	49	49	49

Source: Authors.
Heteroskedasticity test passed.
* significant at 1%, ** significant at 5%, *** significant at 10%

Table 5. Dependant variable: Ln FDI stock 2001

Model	Control V.	1	2	3	4	5
Constant	-6,847*	-6,227*	-3,470	-5,358*	-6,966*	-7,538*
LnGDPpc (2000-2002)	0,912*	0,485*	0,453**	0,637*	0,782*	0,680*
Lnpop	0,567*	0,592*	0,534*	0,564*	0,563*	0,571*
IIFPOI		6,299*				
IFPOIUN49			3,990**			
WCY				0,018**		
GCR					0,295	
ECFREE						0,395**
R^2	0,727	0,812	0,755	0,780	0,734	0,757
F	61,233	64,784	46,142	53,207	41,343	46,791
N	49	49	49	49	49	49

Source: Authors.
Heteroskedasticity test passed.
* significant at 0%, ** significant at 5%, *** significant at 10%

Another important property of our index is how it fits Inward FDI Performance Index data (table 6). Although an index alone cannot explain FDI distribution entirely, our potential index explains the inward FDI distribution more than any other indices considered. R^2 is almost double

that of UNCTAD and the coefficient is statistically significant.[19] And this is also true even if we use the stock of FDI as the dependent variable, like in most cross countries studies (table 5).

Control variables (GDP per capita and population) behave as expected.[20] The market-seeking hypothesis is clearly satisfied: the signs of GDP per capita and population are positive and significant. Regarding the set of indices, it is worth mentioning that our index contributes to explaining geographical FDI distribution. R^2 coefficient improves considerably and is very high for cross country regressions. The second best is the specification with the WCY index (this is not surprisingly because our index draws heavily on it). Curiously, the GCR index, although with the right sign, is not significant in contrast to the finding of Christiansen (2004). One explanation for this finding is that this index encompasses many other variables of a country's competitiveness that have only a marginal role as FDI determinants. The economic freedom index turns out to have only a modest explanatory power and – though better than the UNCTAD index – improves the model very little. In sum, our index is clearly the best one to explain FDI distribution among these 49 countries.

In table 6, we have tested the relevance of the different sub-indices. Since market-seeking sub-index includes explicitly GDP per capita, we have dropped GDP per capita from the set of explanatory variables. As column 1 shows, the political framework for FDI and market-seeking sub-indices are significant and with the correct sign (besides population). This finding is in line with many other studies

[19] The model behaves better if Benelux is omitted and if FDI flows are reduced by the effect of "passing through" FDI inflows, that is, those whose final target country is another country, generally the EU, but which pass through Benelux because they have certain tax advantages. This happens also in Spain with Foreign Securities Holding Companies or in the Netherlands (Fernández-Otheo, 2004). However, since we do not have information for all the countries about the exact extent of this head office effect, removing exclusively the Benelux case would not be justified. Moreover, the correlation of the Inward FDI Potential Index of UNCTAD and the Inward FDI Performance Index is much lower for the periods previous to that analysed here. Finally, although the aim of the paper has not been this, we have regressed the Inward FDI Performance Index by means of the successive stages method with our 70 variables and the result was that the best econometric model would be characterized by the 'Rules and Standard of Treatment' factor (variables 7 to 14 and 16), the 'number of BITs and DITs' variable (17) and the 'X/PIB' (37).

[20] All the indices include GDP per capita implicitly, but this is only a variable in many, therefore it is necessary to include explicitly as explanatory variables GDP per capita and population to capture market size.

that have stressed these institutional variables as key determinants for FDI. If we include sub-indices one by one in order to avoid co-linearity problems and use population and the market-seeking index as control variables, the efficiency of sub-indices is also significant. Therefore, in the model presented in column 4, we included all the significant sub-indices, and again the whole set of explanatory variables are significant. This turned out to be the best specification, implying that the size of the market, inputs costs corrected for productivity (and all the other variables included in this sub-index) and the political framework for FDI are the determinants of FDI.[21]

Table 6. Dependant variable: Ln FDI stock 2001

Model	1	2	3	4
constant	-2,239	-0,832	-2,088	-2,456**
Lnpop	0,520*	0,507*	0,525*	0,539*
pframework	3,157**	3,003**		2,356**
busfacilitation	-1,186			
marketseeking	5,400*	4,852*	6,993*	4,820*
resourceseeking	0,367			
assetseeking	0,099			
efficiencyseeking	2,317		3,405**	2,704**
R^2	0,794	0,771	0,772	0,790
F	22,643	50,639	50,929	41,292
N	49	49	49	49

Source: Authors.
*significant at 0%, **significant at 5%, ***significant at 10%

Replicating UNCTAD's matrix analysis, if we take the average point for the Inward FDI Potential Index and the value one for Inward FDI Performance Index (lower than the average index) as lines of demarcation in order to establish a classification, we obtain a typology of four groups of countries. Table 7 shows the relationship between the Inward FDI Performance Index and the IIFPOI and table 8 shows the relationship between the Inward FDI Performance Index and the IFPOIUN49.

The leading group, the most numerous, is made up of 18 economies and comprise mainly European countries but also Chile, Hong Kong (China), New Zealand and Singapore. This group is very similar to that

[21] Nevertheless, the result that business facilitation, resource-seeking and assets-seeking sub-indices are not significant may lead to reconsider the way we have constructed the improved FDI index, for instance, by giving different weights to the sub-indices.

of UNCTAD. Exceptions are Chile, the Czech Republic and Hungary, which in the UNCTAD model belong to the group of countries with an Inward FDI Performance Index "above its potential". In our model, the potential of these countries is higher than those of UNCTAD's index, with an Inward FDI Performance Index that corresponds, *grosso modo*, with its potential for two reason. First, these economies have a institutional framework conducive to FDI. Second, they have a relative advantage for the attraction of efficiency- and resources-seeking investment, e.g. low labour costs, a high level of education and good transport and telecommunications infrastructure (see table A.3 in the Appendix).

Table 7. Typology of countries according to the Improved Inward FDI Potential Index and the Inward FDI Performance Index

	High FDI performance	Low FDI performance
	Front-runners	**Below-potential**
High FDI Potential	Benelux, Canada, Chile, Czech Republic, Denmark, Finland, France, Germany, Hong Kong-China, Hungary, Ireland Netherlands, New Zealand, Singapore, Spain, Sweden, Switzerland, United Kingdom	Australia, Austria, Iceland, Malaysia, Norway, Taiwan Province of China, USA
	Above-potential	**Under-performers**
Low FDI Potential	Argentina, Brazil, China, Israel, Jordan, Poland, Portugal, Slovakia, Thailand,	Colombia, Greece, India, Indonesia, Italy, Japan, México, Philippines, Republic of Korea, Romania, Russian Federation, Slovenia, South Africa, Turkey, Bolivarian Republic of Venezuela

Source: Authors.

Table 8. Typology of countries according to the United Nations FDI Potential Index and the Inward FDI Performance Index

	High FDI performance	Low FDI performance
	Front-runners	**Below-potential**
High FDI Potential	Benelux, Canada, Denmark, Finland, France, Germany, Hong Kong-China, Ireland, Israel, Netherlands, New Zealand, Singapore, Spain, Sweden, Switzerland, United Kingdom,	Australia, Austria, Iceland, Italy, Japan, Norway, Republic of Korea, Taiwan Province of China, USA,
	Above-potential	**Under-performers**
Low FDI Potential	Argentina, Brazil, Chile, China, Czech Republic, Hungary, Jordan, Poland, Portugal, Slovakia, Thailand	Colombia, Greece, India, Indonesia, Malaysia, México, Philippines, Romania, Russian Federation, Slovenia, South Africa, Turkey, Bolivarian Republic of Venezuela

Source: Authors.

In the tail group, the difference between the indices is much greater. This group includes, according to IIFPOI, developed countries like Greece, Italy, Japan and some emerging economies like India, Mexico and the Republic of Korea. Italy, Japan and the Republic of Korea are three cases that deserve more attention because of their level of development and because, in the UNCTAD model, they are included in the quadrant "below their potential". The potentials of the Republic of Korea and Japan are above the average only in the determinants related to created assets-seeking FDI, while Italy only stands out in the determinants of efficiency-seeking FDI. In the rest of factors, the indices are fairly poor, e.g. those related to policy framework determinants. Some conclusions can be reached from this analysis. First, institutional characters that inhibit the entry of foreign capital should be eliminated; second, the labour costs should be more adjusted to productivity levels; and third, a higher price competitiveness of infrastructures is required.

Regarding other countries in this tail group, like India, Turkey and the Bolivarian Republic of Venezuela (at least for the period analysed), their situation is clearly below the average in all indicators except in those related to resource- and efficiency-seeking investment and, thus their situation is not surprising.

Other countries belong to the atypical group (those whose Improved Inward FDI Performance Index does not correspond to its potential, such as Australia, Austria, Norway and the United States) which receive too low FDI flows in relation to the size of their markets and other factors. With regard to these countries, there appear to be factors that inhibit FDI inflows that are not included in the Inward FDI Potential Index.

The group of countries receiving a volume of FDI over and above their potential as implied by IIFPOI is also quite heterogeneous and includes countries like Argentina, Brazil, China, Poland and Portugal. China, for instance, receives FDI inflows in line with the size of its market, but has an attraction potential lower than the average.

5. Conclusions

We have constructed a new potential index that incorporates 70 variables, all of which belong to a long list of political, institutional and economic factors that the theoretical and empirical literature identifies as location determinants of FDI. The new Improved Inward FDI Potential Index that we have drawn up is, thus, more complete and, provides a

better adjustment to the Inward FDI Performance Index than that of UNCTAD although the number of countries analysed is smaller because of the limited availability of data.

The enhanced properties of our index enables the formulation of policy recommendations with a greater degree of confidence. Moreover, due to the possibility of splitting the overall index in several sub-indices according to the type of FDI, it is possible to better target policy responses to improve countries' attractiveness to FDI. We believe that this is one of the main contributions of our analysis. The UNCTAD's inward FDI potential index is an index that measures a country's attractiveness for FDI inflows in general, but it has the problem that it does not take into account the existence of different kinds of inward FDI. Our index thus allows making a more precise analysis of the strengths and weaknesses of an economy, and, consequently is a more useful policy tool. However, since the adjustment made in IIFPOI is still limited, policy recommendations based on this benchmarking, should be interpreted with caution.

Table A.1 Scores of the factors and variables included in the Improved FDI Potential Index

	2 a 6	7 to 14, 16	15,52, 18 to 22	17	23	24	25	26 to 33	73	34	35	74	36	37	38
Argentina	0,128	0,432	0,222	0,135	0,237	0,075	0,010	0,058	0,089	0,460	0,197	0,060	0,053	0,002	0,083
Australia	0,887	0,618	0,827	0,270	0,407	0,540	0,080	0,769	1,000	0,556	0,541	0,096	0,383	0,063	0,434
Austria	0,829	0,883	0,885	0,429	0,271	0,732	0,277	0,596	0,991	0,405	0,664	0,025	0,880	0,240	0,039
BENELUX	0,798	0,844	0,860	0,871	0,228	0,781	0,162	0,460	0,931	0,429	0,651	0,165	0,832	0,473	0,223
Brazil	0,454	0,414	0,281	0,184	0,576	0,653	0,229	0,307	0,272	0,460	0,076	0,166	0,306	0,007	0,112
Canada	0,864	0,559	0,793	0,571	0,133	0,663	0,052	0,744	0,964	0,508	0,611	0,168	0,658	0,208	0,778
Chile	0,762	0,879	0,749	0,031	0,237	0,702	0,020	0,598	0,585	0,698	0,115	0,039	0,883	0,137	0,137
China	0,660	0,000	0,455	0,429	0,305	0,589	0,156	0,398	0,264	1,000	0,011	0,301	0,504	0,086	0,205
Colombia	0,326	0,487	0,374	0,000	0,237	0,494	-	0,265	0,261	0,429	0,042	0,011	0,472	0,054	0,088
Czech Republic	0,618	0,810	0,582	0,399	0,373	0,956	1,000	0,305	0,588	0,381	0,134	0,018	0,673	0,351	0,021
Denmark	0,850	0,884	0,927	0,681	0,407	0,584	0,242	0,787	0,894	0,437	0,856	0,049	0,815	0,195	0,054
Finland	0,918	1,000	1,000	0,497	0,441	0,633	0,299	1,000	0,911	0,524	0,652	0,019	1,000	0,184	0,043
France	0,773	0,654	0,805	0,798	0,223	0,563	0,172	0,427	0,812	0,389	0,622	0,227	0,821	0,106	0,238
Germany	0,789	0,861	0,893	0,644	0,014	0,321	0,278	0,481	0,870	0,349	0,646	0,339	0,831	0,138	0,382
Greece	0,672	0,780	0,721	0,227	0,237	0,390	0,218	0,266	0,547	0,429	0,298	0,011	0,692	0,076	0,033
Hong Kong, China	0,854	0,914	0,874	0,018	0,881	0,761	0,000	0,910	0,555	0,516	0,647	0,366	0,636	0,799	0,004
Hungary	0,659	0,789	0,620	0,350	0,746	0,642	0,308	0,473	0,389	0,452	0,124	0,017	0,606	0,294	0,013
Iceland	0,793	0,590	0,754	0,117	0,542	0,604	0,218	0,969	0,965	0,500	0,806	0,000	0,589	0,162	0,001
India	0,520	0,167	0,000	0,485	0,214	0,530	0,207	0,175	0,296	0,714	0,000	0,016	0,122	0,016	0,029
Indonesia	0,196	0,225	0,304	0,294	0,407	0,142	0,659	0,102	0,101	0,484	0,006	0,052	0,161	0,179	0,300
Ireland	0,908	0,939	0,836	0,301	1,000	1,000	0,173	0,641	0,730	0,889	0,700	0,094	0,798	0,521	0,009
Israel	0,399	0,721	0,739	0,209	0,203	0,612	0,098	0,507	0,512	0,587	0,488	0,020	0,344	0,167	0,004
Italy	0,707	0,641	0,711	0,558	0,203	0,322	0,165	0,341	0,664	0,365	0,526	0,094	0,508	0,105	0,130
Japan	0,749	0,427	0,637	0,393	0,000	0,277	0,101	0,464	0,578	0,325	0,965	0,039	0,358	0,000	0,128
Jordan	0,522	0,675	0,179	0,049	0,576	0,610	0,030	0,381	0,385	0,587	0,035	0,001	0,532	0,200	0,000
Korea, Republic of	0,651	0,175	0,552	0,331	0,508	0,342	0,012	0,352	0,403	0,659	0,243	0,030	0,282	0,203	0,174
Malaysia	0,686	0,352	0,510	0,307	0,475	0,823	0,196	0,609	0,754	0,714	0,095	0,044	0,668	0,680	0,157
Mexico	0,569	0,489	0,380	0,178	0,271	0,416	0,032	0,174	0,243	0,476	0,144	0,090	0,663	0,119	0,267
Netherlands	0,826	0,859	0,867	0,736	0,254	0,660	0,173	0,653	0,857	0,468	0,661	0,207	0,719	0,332	0,328
New Zealand	0,818	0,768	0,887	0,184	0,305	0,239	0,021	0,770	0,913	0,484	0,372	0,022	0,458	0,150	0,011
Norway	0,931	0,697	0,736	0,669	0,475	0,298	0,324	0,664	0,924	0,500	1,000	0,026	0,230	0,211	0,656
Philippines	0,477	0,286	0,331	0,245	0,339	0,529	0,037	0,123	0,270	0,508	0,015	0,008	0,400	0,256	0,011
Poland	0,542	0,127	0,395	0,417	0,475	0,349	0,185	0,181	0,112	0,627	0,105	0,029	0,260	0,111	0,052
Portugal	0,750	0,718	0,745	0,282	0,305	0,607	0,172	0,385	0,498	0,460	0,295	0,024	0,776	0,125	0,011
Romania	0,457	0,409	0,233	0,417	0,576	0,164	0,157	0,101	0,097	0,246	0,033	0,005	0,235	0,131	0,017
Russian Federation	0,454	0,003	0,070	0,337	0,610	0,180	0,029	0,081	0,010	0,000	0,035	0,015	0,063	0,196	1,000
Singapore	1,000	0,703	0,934	0,288	0,593	0,944	0,000	0,971	0,804	0,802	0,593	0,095	0,674	1,000	0,216
Slovakia	0,548	0,690	0,602	0,258	0,576	0,745	0,269	0,240	0,368	0,492	0,090	0,004	0,550	0,364	0,015
Slovenia	0,663	0,292	0,612	0,080	0,576	0,115	0,199	0,424	0,498	0,524	0,253	0,002	0,424	0,288	0,002
South Africa	0,563	0,303	0,617	0,307	0,407	0,327	0,077	0,411	0,411	0,421	0,067	0,041	0,343	0,111	0,074
Spain	0,800	0,663	0,752	0,301	0,237	0,607	0,109	0,563	0,839	0,460	0,393	0,122	0,724	0,115	0,104
Sweden	0,810	0,833	0,880	0,742	0,475	0,511	0,216	0,706	0,809	0,421	0,723	0,074	0,720	0,214	0,068
Switzerland	0,968	0,751	0,861	0,718	0,593	0,566	0,142	0,774	0,955	0,317	0,950	0,072	0,464	0,199	0,068
Taiwan Province of China	0,681	0,388	0,640	0,074	0,576	0,426	0,091	0,594	0,472	0,690	0,353	0,023	0,371	0,251	0,052
Thailand	0,679	0,341	0,430	0,301	0,407	0,741	0,065	0,402	0,502	0,484	0,040	0,022	0,535	0,330	0,038
Turkey	0,000	0,596	0,404	0,245	0,407	0,450	0,054	0,181	0,280	0,484	0,061	0,015	0,465	0,102	0,015
United Kingdom	0,823	0,754	0,854	0,926	0,407	0,614	0,070	0,737	0,670	0,460	0,661	0,393	0,574	0,103	0,479
United States	0,863	0,696	0,804	1,000	0,237	0,768	0,212	0,746	0,819	0,516	0,940	1,000	0,631	0,002	0,455
Venezuela (Bolivarian Republic of)	0,137	0,285	0,267	0,117	0,271	0,000	0,000	0,000	0,000	0,317	0,121	0,023	0,000	0,085	0,402

	39	40 to 43 - 41	50,44, 45	49,54, 51,46, 53	57,58, 59,64, 65	55,56	6234	61,67, 68,69	70,71	60, 72, 66	IMPOT
Argentina	0,946	0,264	0,395	0,283	0,139	0,209	0,814	0,689	0,056	0,570	0,264
Australia	0,476	0,510	0,875	0,333	0,823	0,017	0,556	0,730	0,125	0,903	0,513
Austria	0,219	0,413	0,861	0,232	0,688	0,583	0,455	0,742	0,191	0,721	0,530
BENELUX	0,227	0,281	0,703	0,552	0,577	0,872	0,577	0,711	0,220	0,923	0,574
Brazil	0,919	0,425	0,440	0,153	0,283	0,141	0,259	0,685	0,101	0,621	0,341
Canada	0,412	0,712	0,799	0,367	0,835	0,000	0,499	0,832	0,325	0,955	0,560
Chile	0,934	0,456	0,737	0,136	0,657	0,013	0,750	0,781	0,072	0,681	0,472
China	0,991	0,570	0,099	0,143	0,297	0,119	0,383	0,676	0,379	0,103	0,365
Colombia	0,928	0,460	0,434	0,081	0,214	0,137	0,047	0,751	0,073	0,445	0,284
Czech Republic	0,902	0,670	0,747	0,201	0,412	0,706	0,756	0,716	0,112	0,734	0,527
Denmark	0,110	0,672	0,715	0,371	0,916	0,355	0,493	0,623	0,082	0,856	0,554
Finland	0,197	0,372	0,923	0,537	1,000	0,061	0,450	0,740	0,147	0,860	0,576
France	0,364	0,229	0,654	0,375	0,739	0,401	0,709	0,641	0,332	0,876	0,518
Germany	0,077	0,000	0,643	0,410	0,787	0,560	0,270	0,756	0,369	0,844	0,502
Greece	0,742	0,311	0,311	0,314	0,551	0,272	0,811	0,750	0,127	0,685	0,419
Hong Kong, China	0,811	1,000	0,827	0,054	0,825	0,737	1,000	0,161	0,197	0,703	0,602
Hungary	0,931	0,702	0,623	0,222	0,272	0,477	0,959	0,685	0,099	0,636	0,484
Iceland	0,468	0,751	0,944	0,276	0,866	0,186	0,684	0,867	0,205	1,000	0,554
India	0,997	0,203	0,748	0,000	0,000	0,329	0,235	0,659	0,061	0,504	0,289
Indonesia	1,000	0,286	0,000	0,118	0,100	0,166	0,691	0,647	0,235	0,000	0,274
Ireland	0,470	0,417	0,840	0,260	0,376	0,412	0,808	0,559	0,109	0,751	0,582
Israel	0,546	0,602	0,844	0,458	0,658	0,284	0,595	0,556	0,000	0,862	0,441
Italy	0,450	0,222	0,229	0,324	0,209	0,613	0,694	0,573	0,159	0,637	0,406
Japan	0,274	0,501	0,210	1,000	0,506	0,657	0,566	0,000	0,172	0,727	0,402
Jordan	0,960	0,581	0,432	0,232	0,357	0,309	0,781	0,633	0,125	0,450	0,385
Korea, Republic of	0,689	0,418	0,353	0,719	0,428	0,355	0,251	0,502	0,240	0,573	0,378
Malaysia	0,905	0,655	0,773	0,096	0,712	0,008	0,487	0,735	0,163	0,698	0,492
Mexico	0,925	0,368	0,348	0,139	0,170	0,210	0,873	0,674	0,283	0,202	0,348
Netherlands	0,223	0,283	0,647	0,366	0,681	0,761	0,454	0,655	0,218	0,925	0,553
New Zealand	0,683	0,574	0,480	0,361	0,695	0,208	0,607	0,868	0,140	0,808	0,473
Norway	0,000	0,344	0,707	0,373	0,872	0,109	0,601	0,704	0,154	0,856	0,522
Philippines	0,981	0,394	0,776	0,044	0,052	0,239	0,339	0,609	0,046	0,691	0,320
Poland	0,915	0,377	0,347	0,296	0,125	0,526	0,829	0,679	0,219	0,237	0,341
Portugal	0,825	0,294	0,156	0,408	0,539	0,307	0,835	0,712	0,070	0,664	0,439
Romania	0,993	0,535	0,277	0,126	0,179	0,404	0,991	0,727	0,103	0,459	0,323
Russian Federation	0,988	0,653	0,378	0,315	0,073	0,199	0,996	0,646	0,218	0,385	0,317
Singapore	0,711	0,923	1,000	0,222	0,739	1,000	0,827	0,435	0,212	0,871	0,662
Slovakia	0,938	0,495	0,509	0,180	0,198	0,506	0,811	0,857	0,087	0,643	0,441
Slovenia	0,814	0,290	0,177	0,424	0,346	0,474	0,684	0,826	0,086	0,645	0,389
South Africa	0,809	0,205	0,172	0,213	0,443	0,145	0,000	1,000	0,180	0,564	0,328
Spain	0,568	0,277	0,479	0,352	0,546	0,340	0,657	0,769	0,272	0,627	0,467
Sweden	0,254	0,210	0,678	0,619	0,873	0,178	0,456	0,745	0,168	0,913	0,532
Switzerland	0,092	0,778	0,901	0,339	0,762	0,522	0,406	0,496	0,069	0,938	0,548
Taiwan Province of China	0,775	0,743	0,567	0,639	0,679	0,316	0,715	0,558	0,189	0,638	0,460
Thailand	0,978	0,678	0,472	0,147	0,401	0,084	0,630	0,775	0,156	0,476	0,405
Turkey	0,879	0,591	0,560	0,056	0,429	0,175	0,267	0,522	0,044	0,578	0,314
United Kingdom	0,360	0,714	0,539	0,397	0,472	0,563	0,564	0,473	0,507	0,628	0,550
United States	0,223	0,858	0,765	0,838	0,847	0,146	0,644	0,719	1,000	0,818	0,662
Venezuela (Bolivarian Republic of)	0,916	0,313	0,245	0,215	0,136	0,173	0,844	0,649	0,168	0,545	0,249

Source: Authors.

Table A.2 Ranking for 49 countries according to their scores in the Improved Potential Index

	IIFPOI (1999-2001)	IFPEI (1999-2001)	IFPOIUN 140 countries (1999-2001)	IFPOIUN 49 countries (1999-2001)
Singapore	0,662	3,978	0,49	0,517
United States	0,662	0,719	0,689	0,704
Hong Kong, China	0,602	6,387	0,424	0,446
Ireland	0,582	5,861	0,436	0,459
Finland	0,576	1,246	0,445	0,482
BENELUX	0,574	10,955	0,454	0,489
Canada	0,56	1,642	0,481	0,51
Denmark	0,554	3,485	0,411	0,441
Iceland	0,554	0,417	0,41	0,471
Netherlands	0,553	3,74	0,454	0,48
United Kingdom	0,55	1,806	0,489	0,51
Switzerland	0,548	1,511	0,416	0,443
Sweden	0,532	3,857	0,455	0,492
Austria	0,53	0,855	0,377	0,396
Czech Republic	0,527	2,929	0,271	0,276
Norway	0,522	0,918	0,489	0,531
France	0,518	1,01	0,422	0,437
Australia	0,513	0,495	0,392	0,415
Germany	0,502	1,419	0,457	0,472
Malaysia	0,492	0,904	0,295	0,277
Hungary	0,484	1,168	0,257	0,255
New Zealand	0,473	1,279	0,318	0,336
Chile	0,472	2,273	0,245	0,232
Spain	0,467	1,314	0,354	0,363
Taiwan Province of China	0,46	0,385	0,405	0,44
Israel	0,441	1,001	0,376	0,392
Slovakia	0,441	1,836	0,238	0,231
Portugal	0,439	1,184	0,29	0,305
Greece	0,419	0,258	0,285	0,301
Italy	0,406	0,297	0,35	0,367
Thailand	0,405	1,04	0,214	0,181
Japan	0,402	0,058	0,428	0,442
Slovenia	0,389	0,36	0,315	0,327
Jordan	0,385	1,163	0,19	0,159
Korea, Republic of	0,378	0,483	0,408	0,427
China	0,365	1,107	0,259	0,23
México	0,348	0,9	0,233	0,204
Brazil	0,341	1,443	0,183	0,154
Poland	0,341	1,256	0,255	0,243
South Africa	0,328	0,696	0,183	0,16
Romania	0,323	0,81	0,149	0,12
Philippines	0,32	0,514	0,195	0,157
Russian Federation	0,317	0,314	0,288	0,264
Turkey	0,314	0,268	0,159	0,138
India	0,289	0,159	0,16	0,119
Colombia	0,284	0,7	0,147	0,113
Indonesia	0,274	-0,68	0,148	0,105
Argentina	0,264	1,311	0,22	0,198
Venezuela (Bolivarian Republic of)	0,249	0,902	0,208	0,185

Source: Authors' calculations.
IIFPOI: Improved Inward FDI Potential Index
IFPEI: Inward FDI Performance Index
IFPOIUN140: Inward FDI Potential Index elaborated by United Nations for 140 countries
IFPOIUN49: Inward FDI Potential Index of the United Nations re-elaborated for the 49 countries in our sample

Table A.3 Ranking of countries for groups of location determinants of FDI

Rank	Country Ranking	Policy framework for FDI	Country Ranking	Business Facilitation	Country Ranking	Market Seeking	Country Ranking	Resource Seeking	Country Ranking	Assets Seeking	Country Ranking	Efficiency seeking
1	Ireland	0,797	Czech Republic	0,712	Singapore	0,633	Russian Federation	0,88	United States	0,7	United States	0,795
2	Switzerland	0,778	Finland	0,711	United States	0,618	Canada	0,634	Singapore	0,697	Iceland	0,689
3	Finland	0,771	Iceland	0,689	Ireland	0,6	Singapore	0,617	Finland	0,664	Canada	0,653
4	United Kingdom	0,753	Singapore	0,68	Hong Kong, China	0,593	Hong Kong, China	0,605	BENELUX	0,66	France	0,64
5	Denmark	0,75	Austria	0,649	BENELUX	0,51	China	0,589	Switzerland	0,627	BENELUX	0,608
6	Sweden	0,748	United States	0,636	Netherlands	0,477	Malaysia	0,573	Sweden	0,607	New Zealand	0,606
7	BENELUX	0,72	Ireland	0,636	Finland	0,476	Thailand	0,565	Japan	0,597	Slovakia	0,599
8	United States	0,72	Denmark	0,627	Denmark	0,47	Hungary	0,549	Israel	0,591	Hungary	0,595
9	Netherlands	0,708	Switzerland	0,609	Germany	0,461	Bolivarian Republic of Venezuela	0,544	Iceland	0,582	Greece	0,593
10	Hong Kong, China	0,708	Canada	0,606	Austria	0,443	Czech Republic	0,531	Netherlands	0,578	Singapore	0,586
11	Singapore	0,704	Australia	0,597	Malaysia	0,44	Indonesia	0,529	Austria	0,576	Spain	0,581
12	Norway	0,702	Malaysia	0,595	United Kingdom	0,438	Taiwan Province of China	0,524	Germany	0,575	Czech Republic	0,58
13	Austria	0,66	Netherlands	0,586	France	0,433	Mexico	0,52	Denmark	0,574	Norway	0,579
14	France	0,651	BENELUX	0,583	Canada	0,431	United Kingdom	0,518	Taiwan Province of China	0,568	Australia	0,578
15	Germany	0,64	Sweden	0,561	Sweden	0,43	Romania	0,515	Hong Kong, China	0,554	Chile	0,571
16	Hungary	0,633	Hong Kong, China	0,556	Iceland	0,411	Jordan	0,514	Australia	0,543	Sweden	0,57
17	Australia	0,602	Norway	0,552	Switzerland	0,401	United States	0,512	France	0,533	Portugal	0,57
18	New Zealand	0,593	Spain	0,53	Norway	0,393	Chile	0,509	Canada	0,528	Romania	0,57
19	Canada	0,584	United Kingdom	0,523	China	0,38	Turkey	0,495	Norway	0,524	Netherlands	0,563
20	Italy	0,564	France	0,493	Chile	0,375	Colombia	0,492	Czech Republic	0,502	Russian Federation	0,561
21	Portugal	0,56	Germany	0,488	Spain	0,363	Brazil	0,485	Ireland	0,498	Slovenia	0,56
22	Iceland	0,559	New Zealand	0,486	Taiwan Provi. of China	0,338	Slovakia	0,483	Korea, Republic of	0,488	Germany	0,56
23	Czech Republic	0,556	Chile	0,476	Japan	0,337	Australia	0,473	United Kingdom	0,485	Ireland	0,557
24	Spain	0,551	Hungary	0,453	Portugal	0,336	Philippines	0,462	New Zealand	0,431	Bp;ovaroam Republic of Venezuela	0,551
25	Slovakia	0,535	Israel	0,433	Australia	0,328	Poland	0,448	Spain	0,425	Finland	0,549
26	Chile	0,532	Thailand	0,428	Israel	0,321	Argentina	0,431	Malaysia	0,41	United Kingdom	0,543
27	Greece	0,527	Portugal	0,416	Italy	0,32	Korea, Republic of	0,427	Hungary	0,407	Argentina	0,532
28	Taiwan Province of China	0,472	Slovakia	0,405	Czech Republic	0,311	New Zealand	0,423	Chile	0,403	Austria	0,527
29	Malaysia	0,466	Taiwan Province of China	0,396	Greece	0,301	India	0,41	Slovakia	0,347	Taiwan	0,525
30	Israel	0,454	Italy	0,373	Slovakia	0,3	Iceland	0,407	Greece	0,346	Malaysia	0,521
31	Slovenia	0,444	Brazil	0,365	Hungary	0,299	Israel	0,384	Slovenia	0,337	Italy	0,516
32	Korea, Republic of	0,443	Japan	0,355	Mexico	0,299	Portugal	0,377	Jordan	0,332	Hong Kong, China	0,515
33	Japan	0,441	Greece	0,355	Slovenia	0,298	Slovenia	0,369	Portugal	0,329	Denmark	0,513

Table A.3 Ranking of countries for groups of location determinants of FDI

Rank	Country Ranking	Policy framework for FDI	Country Ranking	Business Facilitation	Country Ranking	Market Seeking	Country Ranking	Resource Seeking	Country Ranking	Assets Seeking	Country Ranking	Efficiency seeking
34	South Africa	0,439	China	0,352	New Zealand	0,297	South Africa	0,363	Poland	0,323	Thailand	0,509
35	Thailand	0,432	Jordan	0,352	Korea, Republic of	0,283	Greece	0,362	Philippines	0,322	Mexico	0,508
36	Romania	0,419	Colombia	0,34	Thailand	0,282	Norway	0,333	Italy	0,321	Israel	0,503
37	Jordan	0,4	Slovenia	0,309	Jordan	0,271	Spain	0,316	Turkey	0,306	Jordan	0,497
38	Poland	0,391	South Africa	0,306	Philippines	0,237	Switzerland	0,313	India	0,304	Poland	0,491
39	Brazil	0,382	India	0,302	Poland	0,226	Japan	0,301	Thailand	0,287	Switzerland	0,477
40	Mexico	0,378	Korea, Republic of	0,277	Turkey	0,225	Ireland	0,298	Argentina	0,284	South Africa	0,436
41	China	0,37	Indonesia	0,251	Brazil	0,203	Denmark	0,279	Russian Federation	0,277	Philippines	0,421
42	Philippines	0,336	Turkey	0,241	Colombia	0,202	Netherlands	0,278	Brazil	0,268	Brazil	0,416
43	Turkey	0,33	Philippines	0,24	South Africa	0,196	France	0,277	Romania	0,231	Indonesia	0,393
44	Russian Federation	0,295	México	0,216	Indonesia	0,176	Italy	0,267	Colombia	0,23	Korea, Republic of	0,392
45	Indonesia	0,285	Poland	0,207	India	0,174	BENELUX	0,244	South Africa	0,227	China	0,385
46	Colombia	0,285	Romania	0,13	Argentina	0,154	Austria	0,224	Mexico	0,226	Japan	0,366
47	India	0,277	Russian Federation	0,075	Romania	0,13	Finland	0,204	Bolivarian Republic of Venezuela	0,205	India	0,365
48	Argentina	0,231	Argentina	0,058	Bolivarian Republic of Venezuela	0,109	Sweden	0,178	China	0,15	Turkey	0,353
49	Bolivarian Republic of Venezuela	0,215	Bolivarian Republic of Venezuela	0	Russian Federation	0,062	Germany	0,153	Indonesia	0,084	Colombia	0,329

Source: Authors.

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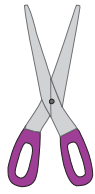

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