Performance of EPZs in Bangladesh: Special Focus on Backward Linkages

A Dissertation

By

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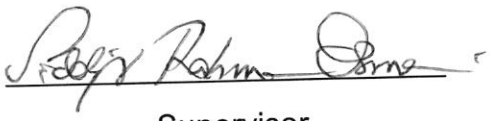

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Abstract

Export Processing Zone (EPZ) has turned out to be a widely used instrument of export expansion and outward orientation by developing countries. These zones are established, often as enclaves, to attract foreign investment by offering them different fiscal and non-fiscal incentives. In general, it is expected that the whole economy will gradually become more open and the importance of this instrument will decline.

Though most EPZs have been successful as a good source of employment, they face criticism due to the enclave nature that limits technological spillovers and demonstration effects. In theoretical discussions, supporters of EPZ mostly are concerned with materialization of these dynamic benefits. Backward linkages with domestic economy have been emphasized to enhance all the potential gains from EPZs.

This study deals with the EPZ enterprises in Bangladesh with the objective of investigating the nature and extent of their relationships with upstream industries in the domestic zone. In terms of the determinants of backward linkages, it was found that knowledge of local suppliers is vital for firms to import from domestic tariff area (DTA). Both local and joint ventures at EPZs in Bangladesh were found to have greater linkages with backward vertical industries in domestic zones compared to completely foreign owned enterprises. There is also the evidence that once a firm establishes linkages with DTA, the firm is more likely to maintain the relationship.

There are some groups who question the feasibility of EPZ scheme because of the fact that most investments within these zones are in the garments sector. They raise the question whether there is any possibility of knowledge spillovers from these simple processing activities. Moreover, investors in EPZs are claimed to be "footloose". However, evidence from this investigation suggests that clothing sector of EPZs in Bangladesh have higher propensity of import from DTA compared to other industries.

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List of Abbreviations and Acronyms

ADB	Asian Development Bank
BOI	Board of Investment
BEPZA	Bangladesh Export Processing Zone Authority
CEPZ	Chittagong Export Processing Zone
DEPZ	Dhaka Export Processing Zone
DTA	Domestic Tariff Area
EPZ	Export Processing Zone
FDI	Foreign Direct Investment
FTF	Free Trade Factories / Firms
FTZ	Free Trade Zone
ICFTU	International Confederation of Free Trade Union
ILO	International Labour Organizaiton
KEPZ	Korean Export Processing Zone
MFA	Multifibre Agreement
R&D	Research and Development
SEZ	Special Economic Zone
TNC	Transnational Corporation
UNCTAD	United Nations Conference on Trade and Development
WTO	World Trade Organization

I. INTRODUCTION

Amidst the dominance of import substitution strategy in most of the developing countries in the 1960s, some nations started to use export processing zones (EPZs) as a policy instrument to exploit their comparative advantage in labour-intensive production. Though the idea of such zones can be observed in the Free Trade Posts of Roman Empire, the first modern version is the transformation of Shannon International Airport of Ireland into a free trade zone in 1959 (Sinclair, 2001). EPZs have gained popularity as a trade policy instrument since this modern revival, and a great number of developing nations are establishing new zones to create employment opportunities. This allows nations to enjoy some benefits of free trade though the overall economy may have restrictions. Considered as a "transitional instrument" for economies to move towards outward orientation, this scheme got support from many groups so that countries can enter world market through demonstration effect (World Bank, 1992). According to this view, the importance of this policy will decline with gradual liberalization of the economy. However, there is also the apprehension that once EPZ becomes a safety valve of employment and foreign exchange, the reduced pressure on the policy makers can hinder further liberalization.

Whatever the objectives are, most EPZs have been successful in fulfilling the goal of employment generation. This has been possible due to unskilled labour-intensive production. However, this mode of production allows the investors to relocate at relative ease creating 'footloose' industries. This character has emerged as a big problem in Bangladesh as enterprises in EPZs have threatened to divest in the wake of conflict with the government over the trade union issue. Moreover, such mode of production in EPZs, often without any assimilation with the overall economy, has been responsible for doubts about the long-term feasibility of this scheme in developing nations and questions have arisen about the value of this policy (Broad and Cavanaugh, 1993). Integration with local economy through backward vertical linkages can construct "rooting" for foreign investors as well as enhance other perceived benefits of EPZs.

This study intends to investigate the extent and nature of backward linkages of the two largest EPZs of Bangladesh, viz. Dhaka EPZ and Chittagong EPZ. The rest of the paper is structured in the following manner. After the literature review in the next section, issues relating to EPZ and domestic economy linkages are discussed in section III. Some aspects of Bangladeshi EPZs are presented with descriptive statistics in the fourth section. The fifth section looks at the situation of backward linkages along with an evaluation of determinants of these linkages with the help of a cross-sectional analysis of the firms operating in the two EPZs. Finally, some policy implications are discussed in section VI.

II. Literature Review

A substantial increase in the number of EPZs and nations hosting such zones has occurred over the last two and a half decades. There are now as many as 116 countries hosting one or more of the total 996 EPZs compared to 25 countries hosting 79 such zones in 1975. Naturally, a large number of studies, surveys and articles focused on EPZ issue discussing the scope and nature of zones, framing theoretical explanations of zone activities, identifying the costs and benefits, and assessing socio-economic impact of these zones on the host countries.

II. 1 Defining EPZ

In a wide range of literature, definition of EPZ has received some amount of attention. This consideration arises partly for the variety of names by which these zones are called and also for the variations in nature and policy governing them. Most writers use the term EPZ instead of Free Trade Zones (FTZ), Special Economic Zones (SEZ) or Free Trade Factories/Firms (FTF) but consider all these as synonyms (Madani, 1999). These are also called in other languages as maquiladoras in Mexico, Las Mecedes in Nicaragua or Pays de Gex in France. A number of newly established industrial parks are also increasingly being

considered as EPZ. There are also geographical variations. EPZs are not necessarily enclave areas, e.g. the whole island of Mauritius is an EPZ. While selling to domestic tariff area (DTA) is restricted for EPZ enterprises, the level of restriction varies. Though backward linkage to domestic economy is welcomed in general, Chinese SEZs do not allow such linkages.

World Bank (1992) uses the most restricted definition,

> "an *export processing zone* is an industrial estate, usually a fenced-in area of 10 to 300 hectares, that specializes in manufacturing for export. It offers firms free trade conditions and a liberal regulatory environment"

Sizeable public investment is required in establishing these zones. This makes EPZ scheme costlier than other export promotion policies like bonded warehouse. However, these enclaves operate with minimum interaction with domestic economy which can limit spillovers and catalytic effects. Therefore, *fenced-in* definition is adopted to assess the impact of zones which offer better infrastructure and utility services to the investors (World Bank, 1992). One practical reason for using restrictive definition is that such exclusive zones can provide quality information in good quantity. In spite of some authors' (e.g. Rhee, et. Al, 1990) inclination to differentiate between FTZ and EPZ, most researchers adopt inclusive definition on the ground that empirical investigations based on narrower definitions fail to envisage the depth and breadth of relevant policies (Madani, D. 1999). For them, EPZ is an area where goods can be imported and stored freely and production is primarily meant for export and domestic sales is allowed with appropriate import duties. Some even go further to include any situation of incentives for manufacturing primarily for export as part of EPZ (ICFTU, 2003). According to this notion, all the members of BGMEA (Bangladesh Garments Manufacturers' and Exporters' Association) fall within the scheme of EPZ (ILO, 2003). However, for our purpose here BGMEA is not considered as part of EPZ since we are following the fenced-in definition.

II.2 Expanding acceptance of EPZ scheme

There has been a consistent rise in the number of EPZs worldwide from 1975 (table 1). There are a number of EPZs at different stages of implementation which hint that the consistent growth in number will continue in coming years. With 11.93 million employees, EPZs have become an important destination of the workers. However, this figure does not include the special economic zones (SEZ) of China where another 20 to 40 million workers are employed (ILO, 2003).

Table 1: Worldwide Evolution of EPZs

	1975	1986	1995	1997	2002[a]
No. of Countries with EPZs	25	47	73	93	106
No. of EPZs	79	176	500	n.a.	996
Employment (millions)	0.8	1.9	n.a.	4.5	11.93

Source: Kusago and Tzannatos, 1998; a) ILO, 2003

However, a few countries are using EPZ scheme more seriously than most others. Some 14 Asian countries have managed to achieve momentous rise in employment (Amirahmadi and Wu, 1995). Bangladesh is one of those countries along with India, Indonesia, Malaysia, Pakistan, Philippines, Republic of Korea, Sri Lanka, Taiwan, Thailand, Togo, Dominican Republic, Mauritius and Mexico. Following a fivefold increase in EPZ employment between 1975 (209,629 labourers) and 1990 (985,700), these countries have observed another fourfold increase with 3,825 thousands employed in 2003. It is likely that EPZ scheme will be used more intensively by developing nations as a tool to generate employment and reduce poverty. However, this creates a tension in the minds of those who are concerned about labour rights and about the likelihood of 'race to the bottom'. The 'footloose' character of the industries invigorates their apprehension.

II.3 Rationale of EPZ scheme

The primary objectives of establishing an EPZ are to create employment and to boost nontraditional export sectors. Madani (1999) identified four nonexclusive views in this regard. One view considers it as a step towards economy wide reforms. The second view sees EPZs in terms of a safety valve to provide much needed foreign currency to accommodate import needs for the host nation and

create jobs to alleviate some of the national unemployment or under-employment. Another view supports EPZs to be used as laboratories to experiment with market economy citing the example of SEZs in China. Finally and mostly important for the developing countries, EPZ scheme is an apparatus to remain in the race for foreign direct investment (FDI). A number of potential gains from EPZ are widely mentioned. These can be summarized as

- Employment generation
- Boosting non-traditional export
- Earning foreign currency
- Accelerating growth of overall economy through backward linkages
- Supporting technological spillovers and other associated externalities

In the literature, creating employment opportunities, boosting gross exports and increasing foreign currency inflow are considered as *static* benefits. The *dynamic* benefits are demonstration or catalyst effects, knowledge transfer through backward linkages or building up of a sound industrial infrastructure. Associated with all these potential benefits, there are a number of potential costs as well, such as loss of revenue, subsidies of utilities, labour rights violation or sometimes environmental degradation. Nonetheless, policy makers are convinced about the net returns and the rising number of EPZs proves this point.

However, fruits of EPZ scheme are not automatic. Creating a conducive environment is a prerequisite of successful EPZs. In the literature, some factors have been emphasized to ensure the success of the EPZ scheme (box 1). Investments in EPZs should be scrutinized by the pattern of industry. Long-term investments are always more rewarding. Industries with technology that match the competence of local entrepreneurs need to be attracted. This also implies the importance of human development to enhance competence. Moreover, the cost of fiscal incentives offered to enhance attractiveness of the zones has to be measured thoroughly. Another important issue is being consistent with the fiscal policy to have a positive impression on the investors.

Both fiscal and non-fiscal incentives need to be in line with the multilateral agreements. For example, ruling out trade union activities in EPZs by the government of Bangladesh was a mistake in the first place. Nonetheless, the conflict has recently been resolved, thanks to the tripartite understanding involving the government of Bangladesh, investors and workers for introducing collective bargaining agents in EPZ.

Box 1: Factors of successful EPZ scheme

- Minimizing cost of incentives and promoting long-term investment.
- Incentives need to comply with multilateral agreements.
- Locationally diverse zones and export processing firms.
- Adequate infrastructure (roads, ports, electricity, water, sewage disposal or treatment).
- Efficient, streamlined and prompt government for the establishment and running of an EPZ (approval of firm applications; customs and other supervisory institutions).
- Privately owned and run zones with greater autonomy.
- Cost and sophistication of communications and transportation to reach target market have a material influence on the attractiveness of the zone.
- Enlarged size of market through trade agreements

Source: Madani (1999)

In giving cash subsidies to the local investors in thrust sectors (toys, luggage and fashion articles, electronic goods, leather goods, diamond cutting and polishing, jewellery, stationery goods, silk cloth, gift items in the case of Bangladesh) the government needs to follow the WTO time lines. Privatization in establishing EPZ can be very useful because it will create investment and reduce government burden. Permitting Korean EPZ (KEPZ) in Bangladesh is, therefore, a positive effort from the government's part. Private EPZs need to be given greater autonomy to allow them maintain flexibility.

One of the biggest problems for increasing investment and trade is limited transportation and communication facilities. This is also relevant in ensuring success of EPZ. Experience of Dakar EPZ, often cited as a text-book example of failure, can be useful here. Though Senegal had been a pioneer in using EPZ scheme by establishing this EPZ in 1974, its disappointing performance (14

enterprises in operation employing 940 workers in 1999) is attributed mostly to the inefficiency of Dakar port (Cling and Letilly, 2001).

II.4 Claims against EPZ

Though almost all concerned with EPZ scheme are aware of the potential gains from EPZs, there are a number of claims made against the system. The points regularly mentioned are[1]:

- EPZs firms are limited to simple processing activities which also limit technology transfer.
- Jobs in EPZs are of low quality and poorly paid.
- Very small shares of the foreign currency earnings generated remain in the country.
- The foreign investments are not secure and can be withdrawn from the country with relative ease, as seen with the numerous companies that have left the EPZs of various countries to relocate in China, where there is particularly little respect for workers rights.
- The investors often import all they need and source very little from the local market.
- Very few governments have managed to implement policies to ensure that zone investors transfer technology and skills to local industry and workers, with the result that the human capital base remains low.

Almost each of these criticisms of EPZ points toward the 'footloose' character. This particular feature has been used by Warr (1989) to show the international movement of capital, on the one hand. On the other, the same nature is held responsible by many groups for persuading the developing nations to violate labour rights (e.g. Marhoz, J. P. and Szymanski, M., 1996; Herbert, 2002; ICFTU, 2003). Though most of them recognize that EPZs have contribution to employment generation, they vastly criticize the job insecurities.

> "... enterprises in the zones gain their comparative advantage through worker exploitation and anti-union repression. Most of these enterprises are out to break their competitors in the price war, and they don't mind breaking the backs of their workers, and the union, to achieve that." (Marhoz, J. P. and Szymanski, M., 1996).

[1] Collected from websites of International Confederation of Free Trade Union (ICFTU) and ILO.

> "It should be noted that the gains generated by EPZs in terms of employment cannot be considered as permanent in any country, and new strategies are constantly required to secure them." (ICFTU 2003)

A study of ILO (1998) emphasized human development to utilize the full potential of EPZ scheme. It also accentuated that to realize the full accompanying economic effects of EPZs desired by the host countries, greater linkages with the domestic economies need to be formed.

II.5 Models dealing with EPZ

Theoretical discussions of EPZ follow, to some extent, the trend of theories concerning foreign direct investment (FDI). However, there is a key distinction between them. FDI, in general, can take place either to sell their commodities in the local market of the economy where the investment is made or to export elsewhere or both. In contrast, firms of EPZs have very limited scope of domestic sales, if it is not completely ruled out. Furthermore, the sales are subject to import duties as if these are exports. Another feature to keep in mind regarding EPZ is that domestic investors are also encouraged to make their investments there, which are by no means FDI. Even so the fact remains that domestic investors are minority in EPZ. On the subject of incentives, EPZ units (both local and foreign) are offered some added advantages over the general benefits to FDI in terms of sound infrastructure, subsidized utilities or one-stop service to avoid bureaucratic tangles. Despite these facts, close ties with FDI are observed in most discussions of EPZ scheme.

Among some early theorists, Hamada (1974) was skeptical about the usefulness of EPZ scheme being motivated by the neo-classical Heckscher-Ohlin theory of comparative advantage. Using the two-commodity, two-factor model, one of the conclusions he drew was that only when the investors are willing to accept lower return to capital than prevailing rate in DTA will they invest in EPZs. Since domestic market is restricted for the capital intensive good through import duties, price ratio of commodities favours capital. However, international prices prevail in

the duty-free zones. Therefore, FDI is assumed to be allowed only in such zones in his model. Following Rybczynski theorem, he also argued that by importing capital and shifting labour to EPZ, the domestic economy will suffer inefficiency through structural shift to more capital-intensive production. According to this model, when foreign investment is introduced in EPZs, national output remains the same in terms of domestic prices and declines in terms of international prices. Hamada recognizes a number of restrictive assumptions (e.g. full-employment, final goods) of this pioneering model. Subsequently, these and some more issues have been taken into consideration by several authors.

Warr (1989) rejected the neo-classical model on the ground that capital is mobile and developed a cost-benefit framework to analyze the net effect of EPZ on entire economy. The benefits in his celebrated framework are total wage bill paid to local employees, procurement from the DTA, utility bills, net profit going to the local shareholders and service charges paid to local financial institutions. Cost includes shadow prices of all these benefits, the physical infrastructure cost of the zones and administrative expenses. In addition to descriptive discussions of key indicators, this framework has been widely used to assess the net benefits (e.g. Kankesu, J. 2003; Bhattacharya, D. 1998; Kusago and Tzannatos, 1998). However, his own findings (ibid) using the framework induced him to finish off with the following remark,

> "EPZs are far from the 'engines of development' that some countries had initially hoped they would become".

Another disapproved assumption of Hamada's model is that there is full employment. In the light of widespread unemployment or underemployment, such assumption is impractical at best. Hamada's model was also restricted to final goods sector. To rectify these shortcomings, Young (1987) introduced import of intermediate goods to their model and later on Young and Miyagiwa (1987) also incorporated unemployment. With a three sector (final goods, adoption and intermediate) model incorporating unemployment, Sinclair (2001) tried to observe the role of EPZ in growth using panel data set covering more than one hundred nations and over the period of 1960 to 1990. His estimates show that EPZ can

increase per capita income growth by more than half a percentage point and majority of the increase is realized through direct effect of labour movement.

Finally, Johansson (1994) used new growth theory emphasizing technology transfer and spillover effects of EPZs. However, spillovers had been an issue of FDI from much earlier (e.g. Hymer, 1976; Blomstrom, 1986). Johansson recognized that these benefits arise from both the lack of capacity (technological, marketing and managerial) and lack of access to international distribution channel on the part of domestic firms. In such situations, domestic firms benefit from access to MNCs with international networks and adoption of new practices. He doubted, however, that low-skilled production process coupled with enclave production base would promote spillover benefits.

II.6 Technology transfer and EPZ

Concern about spillovers created further hope in the countries adopting EPZ that technology and knowledge transfer and 'catalyst' or demonstration effect together will promote non-traditional sectors in domestic economy (Rhee and Belot, 1990)[2]. Moreover, greater efficiency gained in traditional sectors through better managerial practices will move the production possibility frontier to a higher level (Madani, 1999). However, this improvement is not automatic and debate took place on two grounds. First, the low level of technology that FDI brings in the EPZs, shown by the predominance of investment in garments and electronics sectors, is considered as an absence of technology transfer. Secondly, weak backward linkages with domestic economy can slow down spillover effects. Madani (1999) remarked that

> "The enclave economy that results from lack of linkages and technological spillovers leads many in the host economy to question the value of a policy such as export processing zones."

[2] Rhee and Belot (1990) hail the collaboration between Daewoo of Korea and Desh of Bangladesh for the spread of garments industry in Bangladesh. The role of Daewoo and Desh as foreign and local catalysts respectively has been discussed in that paper in some length.

classical H-O model. The idea, put forward by Hymer (1976), which claims that countries do not necessarily have identical production functions, is the basis of spillover effects analysis. He argued that FDI does not mean a transfer of only capital; rather it is a transfer of 'package' containing capital, technology and management. Therefore, there is the strong possibility of domestic economy being benefited from FDI technology transfer. Empirical studies support the view that backward industries benefits higher productivity through their linkages with MNCs (Blalock, 2001 as cited in Smarzynska, 2002).

A number of studies have been carried out to identify the situations where the transfer is faster than others. However, there are divergences in different studies about the impact of 'technology gap' between domestic economy and foreign investor in the rate of technology transfer. Findlay's[3] (1978) model is relevant in the context of EPZ in two ways. His first hypothesis was that the higher the technological gap, the faster the technology diffusion or 'catch up'. Dominance of labour intensive garments and electronics assembling activities with limited technological advancement supports the conception of insufficient technology transfer from EPZs to DTA. The other factor in his (ibid) analysis affecting the rate of technology diffusion is the level of contact between the domestic firms and TNCs. This signifies the importance of backward linkages of EPZs with domestic economy.

Most of the subsequent models and empirical investigations, however, invalidate the notion that larger gaps beget higher and faster spillovers. The finding that technology transfer does not occur in technologically complex industries preceded the 'absorption capacity' hypothesis. According to this hypothesis, originally put forward by Cohen and Levinthal (1990) in the context of firms' research and development (R&D) strategy, internal R&D capacity is the key to take the benefit of external R&D spillovers. Later on this issue has also been taken in the discussion of FDI and foreign aid (e.g. Borensztein et al, 1998) to show the complementary effect of human capital and foreign financing. Therefore, investment in garments and electronics sector in EPZs, per se, cannot be

[3] Discussion of Findlay is based on Emma (2002).

and foreign aid (e.g. Borensztein et al, 1998) to show the complementary effect of human capital and foreign financing. Therefore, investment in garments and electronics sector in EPZs, per se, cannot be considered as lack of technology transfer. Another important aspect of investigations of the relations between FDI and technology transfer is the focusing only on technology transfer from MNCs to subsidiary. Emma (2002) identified the subject (MNC to subsidiary) and object (subsidiary to local firms) of technology transfer. Most studies on spillover effects take for granted that the object part happens automatically. However, for EPZ such assumption is dubious. Only strong backward linkage can be successful in ensuring spillovers from the enclaves of EPZs.

Finally, the question remains whether backward linkages actually lead to positive externality. A number of studies investigated this channel of knowledge transfer from FDI (e.g. Smarzynska, 2002; Pattanyak and Thangavelu, 2004). One important finding of Smarzynska from Lithuanian industries is that there is very limited productivity increase in the same industry. This casts doubt over the perception of horizontal spillovers through enhanced competition. But, productivity in the backward industries did increase through linkages and this improvement is not restricted to any particular region. In contrast to these findings, Parranyak and Thangavelu revealed a negative relation between FDI and upstream industries when they have linkages. Their study is concerned with Indian Pharmaceuticals Industry. The explanation of negative externality in the study is that the domestic suppliers suffered from reduced economics of scale due to some Greenfield projects. These projects integrate the affiliates with the supply network of the parent company because of their higher cost to find local suppliers. In general, it is accepted that there is scope for spillovers to occur by the channel of backward linkages which sometimes may not materialize.

While most literature concerning EPZ focuses on the static gains, Wei Ge (1999) developed a dynamic model of EPZs. Using technological externality, the model provides an analytical account of the last phase of four stage EPZ life cycle. These stages are (i) the construction of basic infrastructure; (ii) the increase of foreign direct investment into, and of exports from, the zones; (iii) levelling-off and

takeovers. In conclusion, Wei (ibid) emphasized on linking EPZ with domestic economy,

> "In order to maximize the dynamic gains that the EPZs may bring about, it is highly desirable to establish a strong linkage between the EPZ and the DZ. The linkage provides a key channel through which various technologies may be diffused from the EPZs to the rest of the host economies."

III. EPZ-Domestic Economy Linkages

There are three possible channels of linkages: forward vertical linkage of domestic sales (distribution), horizontal linkage through sub-contracting (cooperation) and backward vertical linkage of procurement from local suppliers (sourcing). By the nature and definition of EPZ, there is limited scope of forward linkages. Horizontal linkage is a powerful and effective force to create demonstration and catalytic effect in a particular industry. Though linkages through subcontracting are not ruled out for EPZ, empirical evidence does not suggest any such activities of 'out-processing' (Kusago and Tzannatos, 1998). Kankesu (2003) argues that low level of industrialization in domestic economy and import based manufacturing in EPZ hinder subcontracting. Hence, the focal mode of linkage is backward vertical linkage where the firms in EPZs procure raw materials from DTA. All the literatures concerning the cost and benefits of FDI or EPZ have emphasized this part of linkage.

For a foreign affiliate there are a number of possible strategic options to acquire raw materials. They can produce those, purchase from other suppliers within EPZ, import from abroad or procure from DTA. For investors, whether local or foreign, the first and foremost consideration in procurement is their cost-benefit comparison between different sources. In a report on promoting linkages, United Nations Conference on Trade and Development (UNCTAD, 2001) discusses in length the relative advantages for transnational corporations (TNCs) in using local sources. According to the report, linkages are mutually beneficial. Often proximity plays a vital role in sourcing decisions as local suppliers may provide more flexibility and easier negotiation. When proximity is important to ensure efficiency

When proximity is important to ensure efficiency TNCs may take initiative of finding potential local suppliers and helping them to attain efficiency.

Though EPZ firms mostly rely on foreign sources, there are evidences of backward linkages. However, the degree of such linkages varies widely among different nations (table 2). With strong backward linkage, Korea and Indonesia have reached a state where the boundary of EPZ is hardly visible.

Table 2: Domestic share in total raw materials of the EPZ enterprises in selected countries

Country	Year[a]	%	Year[b]	%
Korea	1982	34	1985	32.3
Malaysia	1982	4	1987	17.7
Sri Lanka	1988	5.3	1991	3.8
Indonesia	1982	41	n.a.	n.a.
Philippines	1982	6	n.a.	n.a.

Sources: a) Kankesu (2003) b) Kusago and Tzannatos (1998)

Plausible explanations of their success are that they had some sort of sound industrial base of industrialization and EPZ was part of the liberalization policy. In Sri Lanka, domestic economy offered only sub-products and services and domestic procurement has consistently been low (Kankesu, 2003).

As a general direct effect of backward linkage, output and employment rises in the domestic supplying sector (UNCTAD, 2001). Yet, the thrust for backward linkages in literature is on the indirect effect that extended linkages can enhance the potential benefits of knowledge spillover and other externalities. Therefore, EPZs need to be integrated with the supplier sector to gain productivity increase from spillovers. As Kusafo and Tzannatos (1998) put it,

> "The limited role of such externalities is corroborated by the fact that backward linkages from the zones to the domestic economy are often weak, and the use of domestic raw materials by EPZs has not been significant."

The degree of benefits from extended export, foreign exchange earnings or demonstration effect related to EPZ also depends, to some extent, on the level of backward linkages. EPZs certainly increase the gross export of a country. However, gross export is not a noteworthy measure of benefit since heavy dependence on foreign materials would make gross export to exaggerate the

benefits. Hence, net export is a more useful measure of true contribution of EPZ to foster export. Higher share of local content apparently improves the net export (Madani, 1999).

In terms of the impact on balance of payment of an economy, contribution of EPZ depends on certain conditions. Foreign exchange earnings by increasing export from EPZ does not have any impact on the overall economy when these currencies are held in liquid form by the firms or used to import capital or intermediate goods (Warr, 1989). Only when these are converted to local currency, there is possible positive welfare effect provided the official value of foreign currency is not higher than the economic exchange rate. EPZ firms exchange foreign currency to pay the wage bills, utility bills as well as the dues to the suppliers. Therefore, domestic suppliers are in fact exporting their commodities or substituting imports.

More interaction of domestic entrepreneurs with foreign investors in EPZs can also augment the 'catalyst' or 'demonstration' effect. Backward vertical linkage is very important to form industrial clusters and to maintain their growth in host countries (Schmitz and Nadvi, 1999). From the point of view of long-term viability of EPZ, high level of integration of foreign investors with domestic suppliers is necessary to make them less footloose (UNCTAD, 2001). It needs time-consuming efforts to find out new suppliers at new settings and build up relationships. Once such relations are formed, it becomes costly to shift elsewhere.

Though a lot has been said about the necessity of backward linkages, there are relatively few studies to discover the determinants of their establishment. Belderbos et al (2001) examined the determinants of backward vertical linkages for 272 Japanese electronics manufacturers operating in 24 countries. Some other studies (e.g. Kelegama and Foley, 1999) also deal with the issue and most of them are restricted to particular industry.

Before going into the discussion of backward linkages and their determinants in the context of Bangladeshi EPZs, some other aspects of these zones are investigated in the next section.

IV. EPZs IN BANGLADESH

Bangladesh adopted the EPZ scheme in 1983. Since then, 6 EPZs have so far been established in different locations by the government and one private EPZ is under implementation at Chittagong. At the end of the year 2003, the number of enterprises in operation stood at 192 with another 26 units at different stages of implementation. However, the initially established two EPZs located in Dhaka and Chittagong are hosting 96 percent of the total number of units. Therefore, all the discussion here is concerned with the Chittagong Export Processing Zone (CEPZ) and Dhaka Export Processing Zone (DEPZ) if not mentioned otherwise.

IV.1 Employment

As it has been observed in the literature review, employment generation is one of the key indicators to assess the performance of an EPZ. EPZs in Bangladesh have been turning into an expanding source of jobs for employees seeking jobs in manufacturing sector.

Table 3: EPZ and Total Employment in Bangladesh

Employment in EPZs				Total manufacturing employment [a]	
Year	CEPZ	DEPZ	Total	Year	Total (million)
1991-92	14,614	-	14,614	1990-91	5.93
1995-96	28,705	8,828	37,533	1995-96	4.10
2003	80,031	47,157	133,304*	1999-00	4.30

Source: BEPZA a) Asian Development Bank (ADB) database
* includes all six EPZs.

At the end of 2003, over 133 thousands local individuals were employed in all the six EPZs. Of them 95.41 percent were employed in CEPZ and DEPZ (table 3). While there is a consistent rise in employment in EPZs from 14,614 in 1991-92, total manufacturing employment in Bangladesh shows an eclectic pattern falling between 1991-92 and 1995-96 and rising in 1999-00. Although the importance of EPZ in terms of employment generation in manufacturing sector is rising, EPZ employment as a percentage of total manufacturing employment in Bangladesh stood at 4.30. However, it has to be considered that small-scale cottage industries and medium enterprises dominate the manufacturing sector in Bangladesh. Most of

the employment in such ventures is informal in nature unlike in EPZs. Another important aspect of the EPZ employees is that more than 60 percent of them are women (ILO, 2003; Bhattacharya, D. 1998).

Along with employment, the issue of labour standard also comes in. Restriction on trade union activites within EPZ is certainly a gross violation of core labour standard. However, a survey by Keith and Mashuda (2003) involving EPZ and non-EPZ garments manufacturers in Bangladesh shows that enterprises within EPZs maintain a better labour standard compared to their non-EPZ counterpart. The study considered the minimum and average wage as well as non-wage issues like work environment, job security, social accountability, labour safeguards etc. for the cross evaluation. Some of their findings regarding social compliance of employers are shown in table 4.

Table 4: Comparison of labour standard between non-EPZ and EPZ units in Bangladesh

Item	Non-EPZ	EPZ
Working hours per month	208	208
Working days per week	7 – most weeks	6 – rarely 7
Overtime hours per day – maximum	4 + (30% to 45% basic rate), regular	2 + (100% basic rate), as requested
Labour productivity (indicative)	10	15
Appointment contracts	Verbal	Written
Starting age	14	18

Source: Keith and Mashuda (2003)

Considering the overwhelming presence of garments manufacturer both within and outside EPZs, it can be generalized that EPZ enterprises does not necessarily degrade labour standard. The same study discovers that for the same category of works, EPZ employees receive higher payment than non-EPZ workers. However, considering the higher productivity of the workers within EPZ enterprises, possibility of labour exploitation cannot be ruled out.

IV.2 Investment

Cumulative investment in all six EPZs of Bangladesh stood at 663.97 million USD by the end of 2003. Of this sum, 368.10 million dollars were made in CEPZ and

another 263.78 million in DEPZ. However, this investment includes both local and foreign source. There is disparity in FDI data provided by Bangladesh Bank and Board of Investment (BOI). Data of whichever source is used; the general picture is that Bangladesh has been fairly unsuccessful to attract foreign investors. FDI in Bangladesh has decreased consistently from 1998 to 2002. However, according to a recent report, a positive change was observed in 2003. This rise is expected to continue at least in 2004 and majority of the change is likely to happen in EPZ (CPD, 2004). The same report also mentions that more than 63 percent of the net FDI of 63.50 million USD in Bangladesh for the period of July-September 2003 was invested in EPZ. Therefore, EPZ scheme has been more effective tool to attract FDI than other policies adopted by the government. However, in terms of fiscal incentives, there is hardly any difference for FDI inside or outside the EPZs.

Table 5: Sectoral composition of investments in EPZs in Bangladesh on December 2003

Sector	Foreign investment[a]	Local investment	Total Investment
Garments	193,848.75 (35.27)	20,041.29 (24.35)	213,890.05 (33.85)
Textiles	110,775.10 (20.16)	21,867.97 (26.57)	132,643.00 (20.99)
Knitting	40,439.08 (7.36)	7,538.06 (9.16)	47,977.14 (7.59)
Electronics	38,407.00 (6.99)	433.00 (0.53)	38,840.00 (6.15)
Garment Accessories	32,528.74 (5.91)	5,299.92 (6.44)	37,828.66 (5.99)
Leather Goods	20,930.05 (3.80)	19,398.00 (23.57)	40,328.05 (6.38)
Terry Towel	16,603.00 (3.02)	3,918.00 (4.76)	20,521.00 (3.25)
Metal Products	14,827.34 (2.70)	0 (0.00)	14,827.34 (2.3)
Others	81,223.32 (14.78)	3,801.07 (4.62)	85,024.16 (13.50)
Total	549582.4	82,297.31	631,879.4

Source: BEPZA, investment in '000 of dollars; figures in parenthesis are the percentages of respective column totals. a) also includes joint ventures.

Sectoral distribution (table 5) of investment shows that garments and textile sectors are among the most favorite sectors to both local and foreign investors. Foreign investors are investing 35.27 percent of their total investment in garments and another 20.16 percent in textiles. The comparable figures for local investors are

24.35 and 26.57 percent respectively. However, in electronics and metal products 6.99 and 2.70 percent of foreign investments are made respectively with hardly any presence of domestic investors. Conversely, in leather goods sector 23.57% of local investment is made compared to 3.80 percent of foreign investment.

According to the country of origin of investment, South Korea is the leading foreign investor in Bangladeshi EPZs. There were 150 foreign affiliates in all the EPZs, both joint ventures and completely foreign owned, at the end of the year 2003. Of these, more than one third, 52 units, are South Korean projects. Japan and Hong-Kong follow with 21 and 17 ventures respectively. While Korean investment is made mainly in garments and textiles, investors of both Japan and Hong-Kong are concentrated on electronics and metal products.

IV.3 Export Promotion

Promoting exports is another ingredient of the objectives underlying the establishment of EPZ in Bangladesh. Apparently, production in the zones is export bound. Export to domestic economy is allowed, subject to import duties. EPZ firms also export a portion of their products to other export oriented industries (EOI) outside the zones. However, the performance of EPZ is evaluated in terms of export to foreign market. Average growth of EPZ gross export is found to be higher than that of national export (table 6).

Table 6: Export of Bangladesh (EPZ and national)

Year	National rxport (million US$)[a]	Total EPZ export (million US$)[b]	Annual Growth in total export[a]	Annual Growth in EPZ export[b]	EPZ export as percentage of total export
1997-98	5161.20	539.55	16.81		10.45
1998-99	5312.86	605.55	2.94	12.23	11.40
1999-00	5752.20	725.44	8.27	19.80	12.61
2000-01	6467.30	883.24	12.43	21.75	13.66
2001-02	5986.09	866.64	-7.44	-1.88	14.48
2002-03	6548.44	929.03	9.39	7.20	14.19

Source: a) Export Promotion Bureau (EPB) b) only DEPZ and CEPZ

As a result, EPZs have gradually turned out to be a consistent source for the growth in national export. Export from Bangladesh observed a setback in 2002

following the September 11th event in 2001. Prior to that, export had been rising but at varying rate.

Growth in EPZ export also observed a downfall in 2002 but a relatively less decline than total export. Annual growth in EPZ export is higher in all years except 2002-03 when national export bounced back more strongly than EPZ export. Therefore, the share of EPZ in total export has declined in that year to 14.19 percent from 14.48 percent in 2001-02. The share of EPZ in total export may seem to be small. However, EPZs constituted merely 3.83 percent of national export in 1991-92 (Bahattachrya, D. 1998) and importance of EPZ in export expansion is likely to increase if the newly established ones start contributing.

Gross export volume does not show the entire picture of EPZ export since the enterprises also import in high volume. Therefore, net export is considered to evaluate the contribution of EPZ in total export. As table 7 shows, net to gross export ratio of EPZs was the highest in 2001-02 with 33.76%. Net export experienced a jump in 2000-01 when the value of net export almost doubled from

Table 7: Net export of EPZs in Bangladesh

Year	Amount of net export (million US$)	Net export to gross export (%)
1997-98	115.84	18.21
1998-99	177.36	24.92
1999-00	151.42	17.00
2000-01	301.60	28.24
2001-02	363.06	33.76
2002-03	353.79	29.59

Source: BEPZA

1999-00. The ratio of net export to gross export at 29.59% is a reasonable compared to EPZs in some other countries. For example, net export as percentage of gross export was 17.80 in Mexican maquilas in the year 2000 (Mustapha and Enrique, 2002), 27.9 in Sri Lanka in 1980 or 16.40 in China in 1990 (Amirahmadi and Wui, 1995).

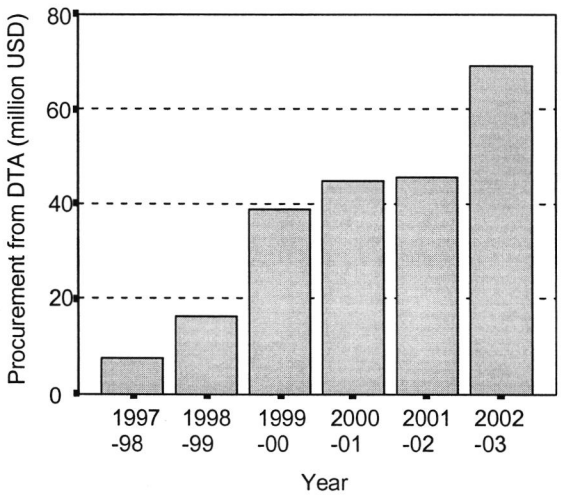
In terms of diversification of merchandise, EPZs made the earlier contribution through the spread of readymade garments and textiles which have now turned out

to be the largest export items accounting for more than three quarters of total export. Presently, firms of EPZs are showing signs of further diversification as assembled electronics and electrical goods; tents, and some metal products are exported mostly (if not only) from EPZs.

V. Analytical Explanation of Backward linkages of EPZ with DTA

The value of import from DTA has increased from only $7.80 million in 1997-98 to $69.20 million in 2002-03. As figure 1 shows, this value has increased in all the years concerned.

Figure 1: Value of supply to EPZ from DTA in Bangladesh

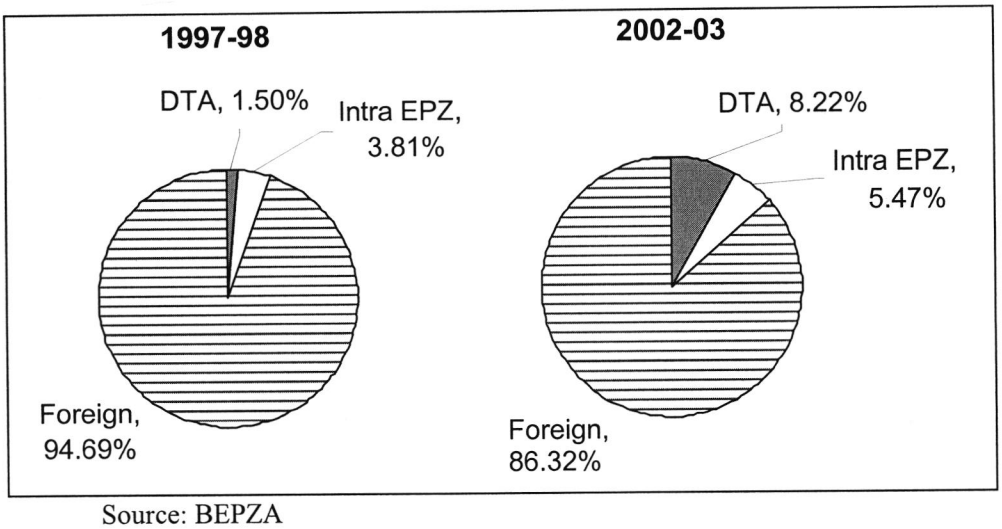


Growth in the use of local source was more than 100 percent in both 1998-99 and 1999-00 (table 8). Low base of import from DTA in early years is one of the reasons for extraordinary growth. Moreover, a number of enterprises started operation, especially in DEPZ, in that period. However, this extreme growth was followed by two years of slow growth and in 2002-03 it started to accelerate again.

Nonetheless, most EPZs depend on foreign sources of materials to perform the processing activities. EPZs in Bangladesh do not show difference either and these

have mostly been dependent on imported materials from abroad. However, the important thing to consider is that the rise in the value of local supply has not been

Figure 2: Sources of raw materials for EPZs in Bangladesh



Source: BEPZA

offset by proportionate rise in import from foreign sources. Therefore, the share of DTA in total EPZ import has kept on rising and dependence on foreign sources has declined (figure 2). Suppliers from both within EPZ and DTA have managed to increase their shares in total raw materials procurement.

V.1 Level of Backward linkages

The main objective of this paper is to see the level and determinants of backward vertical linkages with the EPZ enterprises in Bangladesh. Backward linkage here is measured in terms of percentage DTA supply as a percentage of the total import by the firms. Upto 1995-96, EPZ in Bangladesh showed a gloomy picture in terms of linkage with the local suppliers. In 1992-93, the enterprises of the Chittagong EPZ imported 2.4 percent of their total import from the DTA. This share declined to 1.41 percent in 1995-96. Dhaka EPZ was established in 1993 and in 1995-96 the units from here used local sourcing for mere 0.33 percent of total import (Bhattacharya, 1998). The consistent rise of domestic share in total import thereof tends to support the possibility that there is a lag for backward linkages to occur.

Table 8: Import from DTA by EPZ enterprises in Bangladesh

Year	Growth in value (%)	Share of DTA in total import (%)	DTA supply in total export (%)
1997-98	n.a.	1.50	1.45
1998-99	109.20	3.05	2.69
1999-00	137.22	5.23	5.33
2000-01	16.01	5.86	5.08
2001-02	1.96	6.43	5.28
2002-03	51.15	8.22	7.45

Source: BEPZA

Rising share of DTA in total import does not leave room for complacency since it is still very low at 8.22 percent. Compared to the performance of some other nations (table 2), these two Bangladeshi EPZs are moderately successful in procuring from DTA suppliers. Moreover, a look into backward linkages at firm level shows wide disparity (table 9). As many as 66 (39.3 percent of total units under consideration) units did not procure anything from DTA in 2002-03.

Table 9: Frequency of linkages of EPZs in Bangladesh in 2002-03

Share of DTA in total import (%)	Frequency	Percent
0	66	39.3
0.001-5	55	32.7
5-10	12	7.1
10-15	4	2.4
15-25	7	4.2
25-50	11	6.5
50-75	11	6.5
75-100	2	1.2
Total	168	100.0

Source: BEPZA

Another 55 units had weak linkages with 0.001 to 5.00 percent of local procurement. But, some 24 enterprises made strong use of local suppliers by procuring more than 25 percent of their respective total imports from DTA. Only 10 companies comprising 6 percent of total number of units under consideration accounted for more than 64percent of the total value of purchase from DTA. It is

important to discover the underlying reasons for some firms using local sources very intensively while many others failing to form any sort of linkages. The rest of this section is concentrated on discovering the factors underlying these differences.

V.2 Determinants of Backward linkages

Competence of domestic suppliers to provide quality input at competitive price has a great influence over the level of linkage with both the local firms and foreign ventures in EPZs. To procure from DTA, there has to be efficient sources in the first place. A number of studies dealing with the issue of procurement strategy of MNCs conclude that lack of efficient domestic suppliers is the most important obstacle to backward linkages (Battat et al., 1996). Success of Korean Masan as well as of some other East Asian zones in terms of linkages has been attributed, to some extent, to the already established industrial base outside (Madani, 1999). However, this issue could not be incorporated here for the practical reason that it is dealing with only Bangladeshi EPZs. A cross country analysis could investigate this issue properly since the level of competence varies between countries. However, there can be regional variations in industrial base. Therefore, difference in DEPZ and CEPZ is investigated, but no variation is expected.

Besides cost, quality, reliability and flexibility of local suppliers, a number of factors affecting local sourcing have been identified in the context of FDI (OECD, 2001). These include

a. Investment motives and strategies of the TNC
b. Technology and market position of the TNC
c. Sourcing flexibility of the local affiliates of the TNC
d. Age of foreign affiliates
e. Mode of establishment
f. Size of affiliate
g. Sector in which affiliate operates

In regard to the motive of FDI the general understanding is that domestic market oriented industries procure more from domestic sources. Since export processing zones hardly have any intention of capturing local market, this issue is not incorporated here.

Knowledge about local suppliers is an important factor to create linkages. As a result, local investors in EPZs and joint ventures are likely to establish higher level of linkages. A glance at aggregate level (table 10) also suggests such relationships. Goods worth 28.82 million USD (41.65 percent of total DTA supply to EPZ) were procured by foreign enterprises in 2002-03. However, value of import of only 15 joint ventures is more than 85 percent of that of 113 completely foreign owned firms. This is reflected in share of DTA suppliers in firms' total import. While joint and local ventures' import from DTA constitutes 42.4 and 17.64 percent of their total procurements respectively, the corresponding figure for firms under complete foreign ownership is only 4.14 percent.

Table 10: Ownership pattern and linkages of EPZ enterprises in Bangladesh (2002-03)

Type of enterprises	Number of enterprise	Import from DTA (million USD)	Share of local supply in total import (%)
A (Completely foreign owned)	113	28.82	4.14
B (Joint ventures)	15	24.97	42.40
C (Local ventures)	44	15.40	17.64

Source: BEPZA

Size of enterprise may also have influence over linkages. Large enterprises tend to procure less from domestic sources than small ones (UNCTAD, 2001). The explanation of this pattern is that large investors procure at large quantity and suppliers from DTA are less convenient with regular supply at large volume.

Level of technology and characteristics of industry also influence linkages. UNCTAD (2001) classifies industries into primary, manufacturing and tertiary sectors; and argues that only some part of manufacturing sector will show linkages where production is divisible into separate stages. However, in the present context

the level of technology, measured crudely by employment per 1,000 dollars, is likely to be an insignificant factor influencing backward linkages. Variation in technology, in terms of primary-manufacturing-tertiary sectors is absent in these EPZs. Since investment in EPZs is concentrated in only a few manufacturing activities, the level of technology will be very much the same.

Table 11: Sector-wise import of EPZ enterprises from DTA in Bangladesh (2002-03)

Sl no.	Products of enterprise	Number of enterprise	Import from DTA by the units of the sectors (million US$)	Share of DTA in total import of the sector
01	GARMENTS	40	35.91	8.89
02	GARMENT ACCESSORIES	19	0.06	0.23
03	TEXTILE	18	16.34	10.81
04	TERRYTOWEL	13	3.42	24.40
05	KNITTING	12	5.44	6.90
06	ELECTRONICS	11	1.17	3.99
07	LEATHER GOODS	10	2.10	7.38
08	PLASTIC GOODS	10	0.36	4.18
09	METAL PRODUCTS	8	0.18	1.86
10	CAPS	7	2.45	6.00
11	TENT	3	0.59	1.61
12	PAPER PRODUCTS	2	0.00	0.00
13	SERVICE ORIENTED INDUSTRIES	2	0.00	0.00
14	ROPES	2	0.75	29.19
15	FISHING REEL & GOLF EQUIPMENT	1	0.14	1.87
16	SURGICAL TOWELS & SPONGES	1	0.00	0.00
17	MISCELLANEOUS	9	0.30	7.74
	TOTAL	**168**	**69.20**	**8.22**

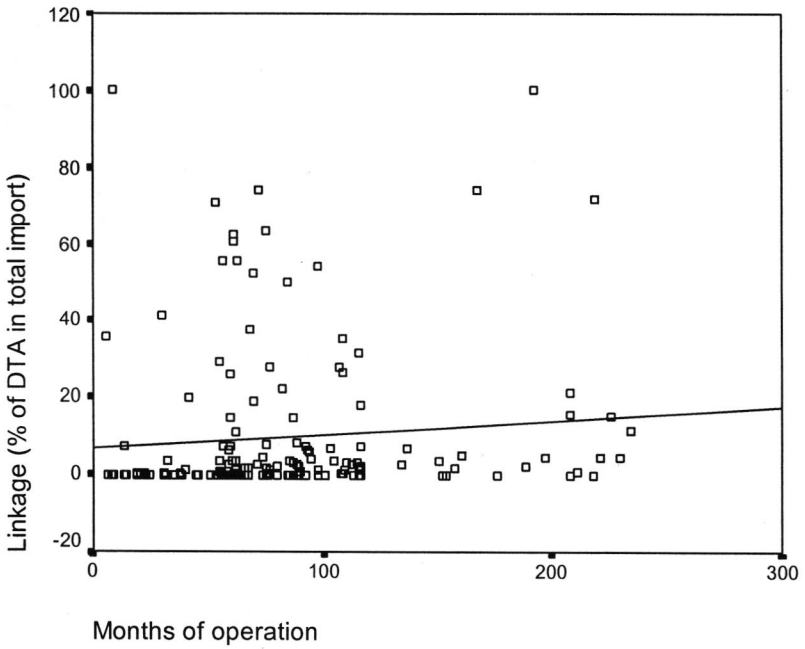
Source: BEPZA

As most units are textile and garments sector; and there are only a few in other sectors, only garments sector will be considered to see any possible variations. All the items of serial number 1,3, 4 and 5 in table 11 will be measured as clothing sector.

Length of operation of firms in EPZ will be assessed to evaluate the 'vintage' effect hypothesis put forward by O'Farrell and O'Loughlin (1981). According to this hypothesis, earlier established firms gain experience of using local suppliers and can make use of them more intensively. Moreover, from the perspective of suppliers from DTA, forming linkage is a time consuming process and they can

reach only the firms which are operating for some period of time. However, figure 3 suggests a weak support of vintage effect.

Figure 3: Linkages and months of operation of EPZ enterprises in Bangladesh (2002-03)



Bhattacharya (1998) argued that one of the impediments to successful linkages is deeming local supply as export and formalities arising therein. Therefore, there is a possibility that some local investors will start operation within EPZ as a supplier to other firms and thereby avoid the hassles of red tape of exporting to EPZ from DTA. Though at aggregate level there is hardly any hint of such act of avoiding EPZ boundary, a negative relationship between import from EPZs and DTA is expected.

Table 12: Inter and Intra-EPZ procurement in Bangladesh (2002-03)

Type (by ownership)	Number of enterprise	Intra and inter- EPZ export (million USD)	Ratio of export to EPZs to total export (%)	Ratio of import from EPZs to total import (%)
A	113	41.60	4.23	5.98
B	15	0.61	0.72	1.04
C	40	5.20	4.12	5.99
Total	168	47.41	3.9712	5.63

Source: BEPZA

V.3 Results

The results of the test are presented in table 13. In equation 1 and 2, the dependent variable is the percentage of procurement from DTA in total import of each unit. Since value of purchase from DTA sources is also important, this has also been considered in the 3rd equation where dependent variable is import from DTA in thousands of dollars. The explanatory variables are

- Local involvement (both joint and local ventures).
- Clothing sector (garments, textiles, terrytowel, knitting and other textile PDT).
- Size of enterprise (cumulative investment of each unit in thousands of dollars.)
- Length of operation (difference, in terms of months, between the project sanction date and the end of period under consideration i.e. June 30, 2003)
- Dhaka EPZ.
- Ratio of import from EPZ to total import.
- Level of technology (employment per thousand dollar investment)
- In equation 2, linkage in 1997-98 is added.

The most robust finding (table 13) is that local involvement in EPZ leads to significantly higher linkage with domestic economy. On the average, local and joint ventures' use of suppliers from domestic economy in their total procurement is higher than that of completely foreign owned ventures by more than 12 percent. This variable is significant in each equation implying that local involvement not only increases the share of DTA in total procurement also results in higher amount. Garments and textiles sectors craft greater linkages than other sectors. Only these two determinants are found to be robust and significant in equation 1.

Despite the general understanding of a lag in linkages to happen, put forward by vintage hypothesis, investigation does not reveal any fact in support of the idea. Enterprises with longer duration not necessarily generate higher linkages with domestic economy. The case may be that once a relationship is established with the suppliers, companies do not opt for changing it frequently. Therefore, it was worth

Table 13: Determinants of linkages of EPZ enterprises in Bangladesh

Variables	Equation 1[a]	Equation 2[a]	Equation 3[b]
Constant	0.005	-4.303	-520.100
	(0.001)	(-0.775)	(-1.604)
Local Involvement	12.571**	15.02**	745.807*
	(3.954)	(3.438)	(2.635)
Clothing	11.625**	6.574	453.94*
	(3.815)	(1.856)	(2.502)
Investment ('000	-0.0002	-0.0001	0.078*
dollars)	(-1.286)	(-1.276)	(2.226)
Months of operation	0.012	0.049	0.993
	(0.405)	(1.233)	(0.364)
DEPZ	0.074	2.200	409.934
	(0.024)	(0.524)	(1.455)
Level of technology	0.036	-0.066	92.97
	(0.916)	(-0.576)	(0.182)
Ratio of import from	0.114	0.049	1.715
EPZ to total import	(0.971)	(0.665)	(0.159)
Backward linkages with		0.357*	
DTA in 1997-98		(2.239)	
Adjusted R^2	0.211	0.322	0.278
N	168	97	168

a) Dependent Variable: import from DTA as percentage of total import in 2002-03;
b) Dependent Variable: value of import from DTA in 2002-03.
Figures in parentheses are t values.
** Significant at 1% level
* Significant at 5% level

investigating whether initial linkages have any effect later on. To this end, backward linkages in 1997-98 have been considered to see whether units with higher linkages continue to use DTA suppliers more intensively than others. 97 units were found to be operating in both 1997-98 and 2002-03. This variable (in equation 2) is positive and significant. Therefore, enterprises that use local sources more intensively than others continue to do so. This implies that policy makers do not have the option to relax that linkages would occur in due time. Rather efforts should be given to establish contact with the local suppliers at the initial phase of investment. Forming suppliers association can be helpful in this regard. Another noteworthy aspect of outcome of introducing initial linkages is that clothing sector losses its significance. This might be due to either or both of the following reasons. One is that clothing units already had higher linkages in 1997-98. The other explanation is that among the other 71 units, clothing produces managed higher

backward linkages than others. However, from further estimates (not shown) the second reason is found to be more plausible. Though earlier established clothing units also improved linkages with local suppliers, this was not good enough to make the variable significant.

No difference between CEPZ and DEPZ is observed as expected. Finally, evidence does suggest that suppliers within EPZs are not necessarily competitors of DTA suppliers. Rather, a positive relation may exist in procuring from within EPZs and from DTA. In other words, firms can use them intensively simultaneously. However, this finding is not significant. Size of investment matters only when value of import from DTA is considered (equation 3). A thousand dollars increase in investment leads to 78 dollars of extra import from DTA. However, this does not necessarily help to increase the share of DTA suppliers in total EPZ import. Therefore, positive coefficient neither supports the notion that larger enterprises depend less on local suppliers nor invalidates it. Insignificance of this variable in equation 1 and 2 also makes this point.

The major findings can thus be summarized as follows:

1. Both local and joint ventures show greater intensity in the use of local suppliers than completely foreign owned firms do.
2. Garments and textile sectors have higher backward linkages with domestic economy.
3. Enterprises that have higher linkages than others in earlier periods tend to maintain that performance.

VI. Policy Issues of EPZ

From policy point of view, the first issue to note is that EPZ scheme is not the first best solution to attain higher growth and development. Overall liberalization of the economy as a whole is required. EPZ is just one of the tools in the liberalization strategy to achieve the ultimate goal of development. Therefore, policy makers need to focus on whether EPZ is leading to liberalization of overall economy.

Optimists argue that once the governments are fully convinced of the benefits of market orientation demonstrated by the EPZs, they will opt for liberal market economy as it happened in Mauritius. Conversely, there is the fear of slow or stagnant liberalization efforts through softened pressure when EPZ becomes a safety valve for employment. Success of EPZ in turn also, to some extent, depends on the macroeconomic and trade policy of a country. When EPZ is a part of the trade liberalization and market orientation strategy of the overall economy, the best outcomes are possible. In the other case, full toll of EPZ will not be realized. (Madani, 1999).

In order to increase the probability of success of an EPZ program, Jenkins et al (1998) suggested focusing on the followings:

- the establishment of EPZs should not be regarded as a substitute for pursuing economy-wide reforms;
- the need to diversify the composition of the export-oriented sector;
- the need to upgrade export-oriented legislation; and
- the need to encourage more and stronger backward linkages between export-oriented firms and the rest of the local economy;

However, they reiterated the importance of market-driven linkages rather than forced linkages through legislation. Government has to create the conditions where the suppliers can flourish. Political stability also exerts significant influence on EPZ's success as it does for FDI or local investment. Though some nations could attract some initial investments in EPZ, political unrest could not sustain the success stories as it happened in Zaire in early 90s. In the context of Bangladesh, this part is also very important to look at. Though there is no civil war like situations here, overall investment climate in terms of rule of law, property rights or governance is not very conducive. Since EPZs are relatively more safe and secured than outside, local investors also find reasons to invest there.

VI.1 Policies to promote linkages:

When a firm has opportunity to gain, linkages should automatically occur for mutual benefits. Therefore, government should not push for backward linkage for its own sake. Rather creating conditions under which local suppliers can flourish

should get priority. There is possibility of market failure when foreign firms do not have the knowledge about local suppliers. In such case, through a linkage promotion or match making program government can play the role of a broker. Suppliers can also have opportunities to adapt themselves from such information exchange. Besides, government needs to support linkage in other ways to enable the suppliers to raise their productivity and to build up cluster of suppliers. Alfaro and Clare (2003) remarked,

> "Perhaps a more sensible policy is to eliminate the barriers that prevent local firms from establishing adequate linkages ... improving local firms' access to inputs, technology, and financing, and streamlining the procedures associated with selling inputs to firms in Export Processing Zones."

The methods of supports are becoming more and more limited these days. So, government has to be selective in both method and industry to promote linkages. A direct method of promoting linkages is to impose tariff on imports. But, this import substitution policy will certainly jeopardize the attractiveness of EPZ where free import of raw materials is a key feature.

Applying 'local content' rule is one of the widely mentioned tools to promote linkages. There are debates whether this actually has any influence over forming backward linkages. Firms can increase local content by using in house production strategy. However, empirical evidence does suggest that local content and other market reservation schemes have a positive influence on the development of domestic suppliers to foreign affiliates (Halbach, 1989). Arguments in favor of local content rule are somewhat similar to infant industry arguments. Applicability of local content rule is phased out by WTO though some nations, sometimes developed countries, use it in disguise of anti-dumping and other measures.

Promoting local involvement can create linkages. Joint ventures have greater propensity to using local sourcing since local involvement may help the foreign investors to have local knowledge. However, the fact remains that there can be difference between forced and voluntary joint ventures.

Investors can be given incentives to form linkages. Exporters can be exempted from value added tax which can increase use of local inputs. Foreign investors may be allowed to enjoy tax credit for the cost of establishing linkages. Malaysia used such kind of a policy where large companies can claim expenditure incurred as a deduction in the computation of income tax (UNCTAD, 2001). The expenditure usually includes the training to suppliers and other technical supports required to ensure quality of supply. This is a part of their Industry Linkages Program.

Though there is no conclusive evidence, liberalizing overall economy may enable the suppliers to be competitive. Of the firms with more than fifty percent of their sales to other EPZ enterprise, each procured less than 2 percent of their respective total raw materials from DTA in 2002-03. These firms are forming backward linkage within EPZ and highly depend on imported materials. Moreover, it was found that garments accessories, plastic goods and packaging units of EPZ also export to other export oriented industries situated outside the zones. These produces depend almost entirely on imported raw materials. This suggests that these units might have been set up to utilize duty-free import of raw materials.

Finally, it is important not to rely on EPZ excessively when liberalizing the economy, because creating incentives for investors all over the nation is needed. Keeping conducive environment within an enclave is not helpful for outside economy where the investors will only realize trickle-down benefit. Programs to make inter-industry linkages can only sharpen the spillovers.

VII. Conclusion

EPZ can be a successful policy when it leads to liberalization of the whole economy. Backward linkages play its part in the development process in two different ways. One is to enhance the potential static benefits of the enclave of

EPZ. The other is to introduce dynamism through increasing spillovers and establishing a cluster of supply sector.

Some key indicators of the success of EPZ in Bangladesh show a moderate level of achievement. The objective of diversifying and enhancing export has been met to some extent. Net export also indicates a high level of value addition and foreign exchange earnings. EPZs have been successful to create employment for unskilled and semi skilled women. However, considering very high population and its density, EPZ employments are still inadequate to reduce poverty. Backward linkage is still very low though it is consistently increasing over the years.

Cross sectional investigation of the EPZ enterprises of Chittagong and Dhaka show that local investors there are more likely to make use of the suppliers outside the enclave. Joint ventures also have high propensity to form backward linkage with domestic economy. High level of backward linkage with the garments and textile industries indicate that Bangladesh has developed competence in this sector and in the post MFA period there will be opportunity of more success. However, this study did not find support for the idea that firms start to use local sources more intensively as their period of operation extends. Newly established firms can also use locally produced materials if they have the information about local suppliers.

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