DEFINING THE ROLE OF GOVERNMENT IN TRANSNATIONALIZATION EFFORTS OF INDIAN SMEs
A Case Study of Indian Pharmaceutical Industry

Jaya Prakash Pradhan
Partha Pratim Sahu

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ISID
Institute for Studies in Industrial Development
4, Institutional Area, P B No. 7513, Vasant Kunj
New Delhi - 110 070

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List of Abbreviations

APIs	Active Pharmaceutical Ingredients
ASI	Annual Survey of Industries
CLAD	Censored Least Absolute Deviations
CMIE	Centre for Monitoring Indian Economy
CGTSI	Credit Guarantee Fund Trust for Small Industries
cGMP	Current Good Manufacturing Practices
DSIR	Department of Scientific & Industrial Research
DCSSI	Development Commissioner (Small Scale Industries)
DPCO	Drug Price Control Order
DPRP	Drugs and Pharmaceuticals Research Programme
DEPB	Duty Entitlement Passbook
DST	Department of Science and Technology
EPCG	Export Promotion Capital Goods
FDI	Foreign Direct Investment
GMP	Good Manufacturing Practices
ICLAD	Identically Censored Least Absolute Deviations
ICLS	Identically Censored Least Squares
IIE	Indian Institute of Entrepreneurship
IPR	Industrial Policy Resolution
ICT	Information and Communication Technology
JV	Joint Venture
LVP	Large Volume Parenterals
MAI	Market Access Initiatives
MDA	Marketing Development Assistance
M&As	Merger and Acquisitions
MSMED	Micro, Small and Medium Enterprise Development
NIESBUD	National Institute for Entrepreneurship and Small Business Development
NIPER	National Institute of Pharmaceutical Education and Research
NIS	National Innovation System
NISIET	National Institute of Small Industry Extension Training
NSSO	National Sample Survey Organization

OFDI	Outward FDI
OTC	Over the Counter
PFIs	Pharmaceutical Formulation Intermediates
PRDSF	Pharmaceutical Research and Development Support Fund
Pharmexcil	Pharmaceuticals Export Promotion Council
PCM	Price Cost Margin
PNB	Punjab National Bank
RCMC	Registration-cum-Membership Certificate
R&D	Research and Development
SMEs	Small and Medium Enterprises
SIDBI	Small Industries Development Bank of India
SIDO	Small Industry Development Organization
SSI	Small Scale Industries
SVP	Small Volume Liquid Vial Section
SCLS	Symmetrically Censured Least Squares
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UBI	Union Bank of India
USFDA	United States Food and Drug Administration
WHO	World Health Organization
WTO	World Trade Organization
WOS	Wholly-owned Subsidiary

Executive Summary

The Context

The existence and growth of small and medium enterprises (SMEs) is an important feature of industrial structure in India. Within the SME sector, Indian pharmaceutical industry has emerged as a strong player, although it is now facing increasing national and international competition. Since the first Industrial Policy of 1948, the pharmaceutical SMEs have been facilitated by various favourable policies like the exemption from the Drug Price Control Order (DPCO), reservation of drugs for exclusive production in small scale sector, process patent regime permitting them to develop their own process of making a drug at a lower cost, preference in procurement for government health services, etc. Pharmaceutical SMEs also benefited from various other provisions for SMEs in general like provision of finance, training, technical, marketing and other support measures, access to raw materials, etc. These strategic interventions have been instrumental in ensuring the rapid growth of SMEs in the pharmaceutical industry and these small firms in turn played their important role in supplying a diversified portfolio of essential life saving drugs at affordable prices.

But after 1991, there have been significant changes in the policy regime. For instance, permitting 100 per cent FDI under automatic approval system and widespread reduction in import duties on life saving drugs, bulk drugs and medical equipments have significantly globalized competition in the Indian pharmaceutical market. Further, the abolition of product patent, and adoption of a duration product patent regime initiated by the World Trade Organization's (WTO) agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), have expanded the level of competition beyond price competitiveness to new forms of innovation, quality, skill and product differentiation.

A number of recent policy initiatives with respect to the pharmaceutical sector reflect a shift from earlier protective regime to more of a facilitating regime. With the dilution of the DPCO, the relaxation granted to the SME sector's product is no more relevant. The permission of 100 per cent FDI and removal of the restriction on large-sized domestic firms required that pharmaceutical SMEs have to improve their competitive strength on their own rather than perpetually seeking the cover of government protection. Since 2005, firms participating in the tender for drug

supplies to government hospitals are first required to have quality certifications such as GMP compliance certificate. Therefore, the low price advantages of SMEs do not reckon unless they have upgraded their manufacturing facilities to GMP and without which they may loose even their stable source of demand emanating from government procurement.

All these changes have led to intense competition for the small pharmaceutical forms. These firms have now to focus more on improving quality of manufacturing practices, product and innovation strategies to survive even in the domestic market. Secondly they have to enlarge their market base from national to global. To operate in the global market, these firms have to undertake suitable internationalization strategies. Transnationalization for supplying to a diversified market and acquiring new technologies, building trading infrastructure overseas, etc., are thus necessary survival tools in a rapidly globalizing world market. But given a number of constraints such as lack of business expertise, technological assets, brand names, financial resources, their internationalization process is much more complex as compared to their large counterparts. A well-designed transnationalization policy regime by the state can play an important role in supporting small pharmaceutical firms to access trans-border market and to source raw materials, technology, skills that are important for competitiveness beyond national boundary.

Objective of the Study

Based on both primary and secondary data sources, the present study analyses the pace and pattern of internationalization efforts by small pharmaceutical firms in terms of their export performance and outward FDI. The determinants of small firms' internationalization process have been examined to identify crucial factors affecting small firms' participation in global markets. It further examines small firms' technological and other performances relative to that of large firms during the period of economic reforms period. The study also attempts to throw some light on alternative policy set up to encourage small pharmaceuticals firms to undertake different options of internationalization and to promote their competitive integration with the international market.

Main Findings of the Study

Past theoretical studies indicate that a firm can undertake internationalization through two different channels. First, the product-market driven transnationalization

occurs when an SME decides to supply to the foreign market through exporting or through undertaking outward FDI (OFDI) to produce final products in the foreign market and/or establish trade-supporting networks to expand its export activities. Transnationalization can also take place when SMEs license out their products or firm-specific advantages to foreign firms operating in the domestic or foreign market, or enter into a joint venture or engage in contract manufacturing. OFDI in the form of overseas acquisitions represents an alternative mode of transnationalization where an SME get an easy access to foreign markets by acquiring a foreign company in the same line of business. Second, the input-market driven transnationalization of an SME occurs when an SME imports raw materials, inputs and capital goods or undertakes OFDI to acquire supply source of raw materials in foreign market. An SME can also adopt the option of in-licensing technology contract with a foreign firm to get access to latter's technologies and/or adopt acquisition route to obtain overseas technology and skills. But all these modes of internationalization require few firm-specific intangible and tangible resources like unique products, managerial capability and skills, brands, marketing experience, information, etc. Previous studies on small firms have also indicated that these firms operate with a large number of infirmities such as low level of technology, managerial capabilities, lack of information on market opportunities (both abroad and home) and government incentives, low skill, etc. The biggest disadvantage these firms are identified with is lack of sufficient finance to expand internally and to undertake export activities or other form of transnationalization. Thus government has a crucial role to play in helping SMEs to enhance their transnationalization capabilities by providing training in international business, information, finance, and supporting their technological dynamisms.

Structure and Composition of Pharmaceutical Sector

Unfortunately, we do not have a comprehensive database on Indian pharmaceutical firms. The present study, based on available data sources such as Annual Survey of India and National Sample Survey Organization makes an attempt to estimate the size of the Indian pharmaceutical industry, following the latest definition of the small firms. As on March 2001, the industry operates with 16, 326 units with an aggregate gross fixed asset of Rs.1, 658 billion and a gross value added of Rs. 583 billion. The industry has employed about a total of 2.5 lakh workers. But the pharmaceutical industry in India is largely dominated by small and medium-sized firms. The small units comprised of 98.5 per cent of total units in Indian pharmaceutical industry in 2000–01 and accounted for about 78 per cent, 25.4 per cent and 39 per cent

respectively in industry worker, gross fixed asset and gross value added. There are just a total of 116 medium units accounting for about 6 per cent of industry employment and 15 per cent of gross value added. An estimated 123 units are large enterprises, which account for 16 per cent of industry workers, much higher than the employment share of medium enterprises. Large units disproportionately account for 65 per cent of industry fixed asset and 45.4 per cent industry gross value added.

Comparative Performance of SMEs Vs. Large Firms

The study also analyses the comparative performance of small and medium firms with large pharmaceutical firms, in terms of select structural and technological ratios, based on Prowess database. The R&D performance of Indian pharmaceutical firms during 1991–2005 suggests that small and medium pharmaceutical firms operate at a much lower level of R&D, largely due to their resource limitation. The R&D intensity of large firms increased from just 0.15 per cent in 1991 to 5.6 per cent in 2005 whereas that of small and medium firms' floats below 1 per cent. Moreover, R&D-undertaking firms constitute about just 18 per cent among small firms and 32 per cent among medium firms whereas they account for 52 per cent among large firms. This suggests that SMEs are lagging far behind their large counterparts in terms of both R&D intensity and proportion of R&D-undertaking firms. The advertising intensity of small firms has witnessed a downward trend since 1995 whereas that of medium firms has grown significantly. Large firms' advertising intensity has fluctuated within 1-2 per cent range during 1991–2005. The price cost margins (PCM) of pharmaceutical firms of all categories have increased during 1991–2005. But the PCM of large firms has grown much faster than that of SMEs. The profitability performance of Indian pharmaceutical SMEs and large firms indicates that the SMEs and large firms had very close profit margins in 1991 but disparity widened since 1997. The above discussion clearly imply that majority of these small firms are not engaged in any kind of in-house technological activities and those minority are engaged in R&D spend an insignificant proportion of their sales. Small pharmaceutical firms are also characterized by relatively lower performance on employing new capital goods from abroad and undertaking advertising and marketing activities as compared to large companies. In terms of profitability performance small firms are found to have been lagging behind. These trends indicate that small pharmaceutical firms continue to be weak on technological front in spite of the process of globalization and liberalization.

Trends in Export Intensity of Pharmaceutical SMEs

Small and medium pharmaceutical firms have consistently expanded their export activities since 1975–76. The volume of exports have grown from about Rs. 6 crore in 1975–76, to Rs. 82 crore in 1986–87 and to Rs. 234 crore in 2001–02. But the share of SMEs to total pharmaceutical exports has constantly declined from 35 per cent in 1974–75, a lowest ever value of just 2.4 per cent in 2001–02. During 1990s SMEs export expansion has significantly lagged behind as compared to their large counterparts. The lower shares of SMEs in total exports reflect that SMEs failed to realize their export potential unlike large firms and continued to rely on domestic market for growth. The export intensity, measured as the proportion of export to total production, of small scale sector has fallen from 7.3 per cent in 1976–77 to 4.13 per cent in 2001–02. This is a dismal indication for the SME sector because transnationalization of market is crucial to meet the global competition. The low export performance of Indian Pharmaceutical SMEs is because of a large proportion of them either completely focused on domestic market or just carries out irregular export order received from aboard.

An analysis of Prowess database indicates that non-exporting SMEs constituted about 35 per cent of total SMEs and another 29 per cent are irregular exporters. About 22 per cent of the SMEs are regular exporters and another 14 per cent have recently transformed into regular exporter status. Between small and medium firms, small firms seem to be less inclined for exporting with 40 per cent of them are not exporting and another 36 per cent are irregular exporters. The levels of export intensity also suggest that although export intensity of small firms has consistently increased since 2000, it has remained below the 10 per cent mark. Medium firms have performed slightly better than small firms in terms of export intensity and the large firms have witnessed a dramatic growth in their export intensity. Their export intensity jumped three and half times between 1990–91 and 2004–05. The low levels of export intensity of the sample Indian pharmaceutical SMEs confirmed that their pace of transnationalization through export activities is very slow as compared to their large counterparts.

Determinants of Export Performance of Pharmaceutical SMEs

An econometric exercise was undertaken to explain the determinants of export behaviour of pharmaceutical SMEs. A number of independent variables such as technology, firm age, firm size, product differentiation, foreign ownership, fiscal

incentives, market power and liberalization were used in the analysis. Among technological variables, R&D has consistently a positive impact on export performance. This implies that Indian pharmaceutical SMEs conducting in-house R&D activities display a stronger export probability. Case studies of select pharmaceutical firms also confirmed that firm-specific emphasis on strict quality enforcement, implementing best manufacturing practices, and incurring R&D to develop cost-effective process, formulations, etc., helps to expands exports and competitive position in world markets. Other technological indicators such as acquisition of foreign disembodied technologies measured by technological payment abroad and the imports of capital goods have also exhibited favourable impacts on export performance. Firm age is not a significant explanatory variable and at best its impact on SME's export performance is minimal or negative. Firm size has been consistently positive and significant in our estimation suggesting that even among SMEs size plays a crucial role in their export performance. Given the small size of pharmaceutical SMEs, our result confirms that size is in fact a strong barrier to these firms' transnationalization efforts. Size related constraints are often reflected in managerial capability, access to finance, information, low firm-specific competitive assets, inadequate scale of operation, etc. Thus government export policies must recognize explicitly firm size heterogeneity and design the support measures that are specific to SMEs export requirement. Our quantitative analysis shows that the two product differentiation variables, advertising and marketing activities don't pose statistically significant effect on export.

Inferences from Case Studies

To supplement the quantitative analysis, we carried out case study of select export oriented pharmaceutical firms. The analysis indicates that there are many firm specific strategies which are often not captured by any quantitative approach. Case studies of six pharmaceutical SMEs suggest that besides upgrading technological capabilities and innovation towards quality improvements, firms have also undertaken collaborative links with research institutes, and universities to upgrade their innovation system. Pharmaceutical SMEs have also acquired quality certification from international regulatory bodies and upgrade their manufacturing process to the levels currently existing in the global industry and ensure global standard of quality in the products manufactured. Indian SMEs are also exploring strategic alliances with foreign firms and engaged in M&As to expand their market position. But generally the role of public support has been extremely limited with

exception in the case of ABL Technologies, Private Limited. Therefore, the internationalization process of Indian pharmaceutical SMEs is largely led by their in-house efforts in terms of innovation, product diversification, adoption of new technology, aggressive marketing, acquisition of firms, and so on.

Role of Outward Foreign Direct Investment

In recent years, Indian pharmaceutical SMEs have also shown a great potential of transnationalization through outward foreign direct investment. A number of case studies reported in the study indicate that outward foreign direct investment (OFDI) has contributed to enhance competitiveness of Indian SMEs by expanding markets and enhancing overseas trade-supporting networks. It has also benefited these SMEs by ensuring access to foreign technologies, skills and research infrastructure based in developed countries. At the policy level, specific measures have been initiated to encourage Indian firms to operate globally. Various restrictions imposed on outward investment of Indian firms in the pre-1990s period have been progressively lifted. Allowing large cash remittances under automatic approval route and explicitly encouraging Indian firms to become multinationals through overseas acquisition have been main thrusts of present Indian OFDI policy regime.

There are different forms of outward foreign direct investment, such as liaison/branch offices, marketing, trading joint ventures, trade/sales subsidiaries, manufacturing joint ventures, manufacturing subsidiaries. But each of these modes involves varying levels of risks and investment. Amongst all these forms of OFDI, there seems to be immense potential of Indian pharmaceutical SMEs undertaking export-promoting types OFDI like establishing liaison/branch offices, marketing joint ventures and sales subsidiaries aboard. The other alternative forms of OFDI such as manufacturing joint ventures and subsidiaries are also important for transnationalization but the scope appears to be limited because Indian pharmaceutical SMEs lack adequate financial and other resources.

Government Policy Mechanism and Support Measures

The existing government polices to promote export and other forms of internationalization strategies are found to be grossly inadequate. The present study not only reviews the existing policies but also attempts to throw some light on alternative policy set up to encourage small pharmaceuticals firms to undertake different options of internationalization and to participate in the global market more

competitively. Government has initiated a wide range of assistance and measures to support pharmaceutical firms' growth and their competitive strengths. Most of these measures have focussed on finance, technology, and training. Past studies have highlighted that the cost of credit is still very high and small firms in general have also been denied of credit. Further, given the size and heterogeneity of small industrial sector, the credit flow is inadequate. It is important to target only knowledge-intensive sectors that generate high value addition, grow faster and generate widespread knowledge spillovers in the economy. Also the financial support to SMEs from these technology-intensive sectors must be linked to their participation in international markets after certain years of domestic operation.

On technology and training front also SMEs from all sectors including pharmaceuticals have been receiving policy support. The Department of Science and Technology initiated the Drugs and Pharmaceuticals Research Programme (DPRP) in 1994–95 for promoting business-institutional collaboration aimed at new product development in all systems of medicine. Recently, with an objective of promoting innovation in the pharmaceutical sector, the Government has established a Pharmaceutical Research and Development Support Fund (PRDSF) in January 2004. PRDSF had an initial corpus of Rs.150 crore and has been utilizing interest accrued on it for funding collaborative R&D projects proposed by industry and academic institutions/laboratories and extending soft loan for R&D. However, above measures by exclusively focusing on collaborative R&D projects do not have any potential to motivate SMEs that are not engaged in R&D activities and also are unable to forge linkages with national research institutions. A significant part of the funding from DPRP and PRDSF has also been extended to various national institutions for upgrading their research infrastructure.

In India, SMEs in general have also been provided with incentives and support measures to modernize their production facilities with adoption of improved and updated technology. Of late the government has taken some measures to help pharmaceutical SMEs to adopt good manufacturing practices (GMP) included in the revised "Schedule M" of the Drugs and Cosmetics Rules, 1945. In addition to above measures, government has been providing direct incentives for increasing in-house R&D activities of a firm irrespective of size. Any industrial unit receiving recognition from the Department of Scientific & Industrial Research (DSIR) for its in-house R&D centre is provided tax deduction equal to the revenue and capital expenditure spent on R&D and in the case of pharmaceutical industry the allowed deduction is 150 per cent of the research expenses. Recognized pharmaceutical firms are also eligible for

duty free import of pharmaceutical reference standards, analytical and specialty equipment for R&D and production.

To promote in-house training in the field of new technology, quality control, entrepreneurship, business and financial management, the Government has established a number of institutes such as National Institute for Entrepreneurship and Small Business Development (NIESBUD) at Noida, National Institute of Small Industry Extension Training (NISIET) at Hyderabad and Indian Institute of Entrepreneurship (IIE) at Guwahati. These institutes have been developing and undertaking training programmes for small enterprises in the filed of marketing, finance, working capital, business forecasting, business communication, computerization, quality, etc. It has started assisting its members by providing trade enquiries received from abroad, organizing trade delegations/buyer-seller meetings at abroad/home, undertaking periodical workshops and interactive meetings on exports related issues, issuing certificate of origin, conveying suitable policy advice related to the emerging problems of pharmaceutical firms to the government.

The Government of India has taken a set of export promoting measures generally available to exporting Indian firms from all the sectors, besides some specific promotional measures to promote exports from pharmaceutical sectors. Among policies aimed at pharmaceutical industry, the most important was the establishment of an exclusive export promotion council, Pharmexcil (Pharmaceutical Export Promotion Council), for pharmaceutical products to take up export services and promotional efforts specific to the sector in more rigorous ways in 2004. The Export Promotion Capital Goods (EPCG) Scheme, Duty Free Replenishment Certificate Scheme, Duty Entitlement Pass Book Scheme, Marketing Development Assistance (MDA), Market Access Initiatives (MAI) are some of the important export promoting scheme. But our study found that most of these policies have not been implemented satisfactorily and the amount of resources committed by the Government is rather inadequate in relation to the existing size of SME sector.

Insights from Field Survey

We contacted, (through personal visit and telephonic conversations) ten odd firms to understand the transnationalization behaviour of these small firms. We analyse their awareness, benefits and constraints of availing different government policy initiatives that affect the transnationalization behaviour of these small firms. The study observed that the most of the surveyed pharmaceutical SMEs are not aware of

major assistances floated by government agencies during last five years to promote exports. Among the SMEs that are aware about the particular government scheme, were unable to avail those benefits or fail to perceive the beneficial impact of these policies on their export performance. It appears that procedural hurdles, delay, and spending of resources that marked availing process of government scheme may not be commensurable for many SMEs that export small amount of products. A set of ten types of assistance required for better export performance were presented before the small pharmaceutical firms to understand their responses regarding the importance of these export requirements and also to identify specific intervention areas. We found that information about the prospective buyers and competitors, access to information on competitors' products and strategies with respect to pricing and advertising activities in specific export markets and readymade and up-to-date databank on overseas buyers are the most crucial requirement for their export business. In addition to asking SMEs the importance of different specific export assistance requirement, they were also asked if they had received any assistance from Government with respect to each of these requirements and mentioned the source of assistance such as Pharmaxcil, SIDO (Small Industry Development Organization), SIDBI (Small Industries Development Bank of India), NISIET (National Institute of Small Industry Extension Training), and NSIC (National Small Industries Corporation). Not withstanding, the crucial importance assigned by SMEs to these export assistance, majority of them have grown without any government assistance. Among the major problems that constraint export by Indian pharmaceutical SMEs shortage of low cost finance to meet the expenses towards exporting and inadequate policy support to receive approvals from overseas regulatory authorities emerged as the two most important areas of concern. Indian SMEs often seem to be discouraged from exporting due to lack of information services on overseas markets and potential buyers, insufficient access to laboratory testing facilities and inadequate tax concessions and other incentives.

The results from survey of firms brought out the need for ensuring access to cost effective laboratory/clinical testing facilities and evolving a standardized documentation procedure for quality control for compound formulations involving safety data sheet, efficacy data, etc. Necessary steps should be taken to give global recognition to Ayurveda. Special and timely financial support need to be extended to upgrade manufacturing facilities to GMP. Special credit should also be advanced to SMEs to finance the pre- and post- shipment expanses. SMEs exporters were also found to have limited expertise to deal with intellectual property right (IPR) issues involved in exporting to different markets and have argued for a supportive

mechanism. The establishment of an Intellectual Property Rights (IPR) centre under Pharmexcil in May 2007 is a right move in this direction.

Specific Intervention Areas

The present study identifies specific intervention areas, such as availability of low cost finance for technological up-gradation and quality improvement, global recognition of Ayurveda, provision of information on overseas markets, improvement in crucial physical and R&D infrastructure, promotion of pharmaceutical SMEs clusters, special and discriminatory incentives schemes for pharmaceutical exporting SMEs and so on, which need urgent policy attention to facilitate Indian pharmaceutical SMEs to stand on their own in the present competitive business environment.

Chapter I

INTRODUCTION

1.1 The Context

The existence and growth of small and medium enterprises (SMEs) is a salient component of industrial structure in India. This is especially so in the case of Indian pharmaceutical industry. The contribution of SMEs to pharmaceutical units, output, investment, and employment is considerably greater than that in many other industrial sectors. In 2000–01, small scale sector comprised 2623 units, nearly 91 per cent of total pharmaceutical units operating in the organized sector (Pradhan, 2007a). In the same year, small units contributed a total production of Rs. 15114 crore (42 per cent of total sectoral output), employed about 1.6 lakh workforce (65 per cent of total sectoral employment) and undertook a total fixed investment of Rs. 285.7 crore (29 per cent of total sectoral fixed investment).

This emergence of the SME sector as a strong player in the Indian pharmaceutical sector can be attributed to the strong government intervention in the form of numerous policies implemented since independence. Begin with the first Industrial Policy Resolution (IPR) 1948, government policies have been protecting and promoting SMEs in general given their vital multi-faceted role in employment generation, regional and economic de-concentration, local resource utilization and mobilization of skill, etc. In pharmaceutical sector, SMEs have been facilitated by various favourable policies like the exemption from the Drug Price Control Order (DPCO), reservation of drugs for exclusive production in small scale sector, process patent regime permitting them to develop their own process of making a drug at a lower cost, preference in procurement for government health services, etc. Pharmaceutical SMEs also benefited from various general provisions for SMEs from all sectors like provision of finance, training, technical, marketing and other support

measures, access to raw materials, etc. These strategic interventions have been instrumental in ensuring the rapid growth of SMEs in the pharmaceutical industry and these small firms in turn played their important role in supplying a diversified portfolio of essential life saving drugs at affordable prices.

In the above background, the Indian pharmaceutical industry is an excellent case study of the development of SME sector and understanding the impact of public policies on their transnationalization process. The need to analyze transnationalization process of the pharmaceutical SMEs has assumed significance in the face of radical changes in India's macro and sectoral policy regime with emergence of new global policy environment involving trade, foreign investment and technology. These national and transnational factors have led to following three important consequences for the business environment of Indian pharmaceutical SMEs.

1.2 Local Market but Global Competition

The liberalization of policy measures since 1990s, particularly, permitting 100 per cent FDI under automatic approval system and widespread reduction in import duties on life saving drugs, bulk drugs and medical equipments have significantly globalized competition in the Indian pharmaceutical market. Even if SMEs are just focused on the domestic market they have to face competition from cheap imports of drugs and raw materials and from expansion of existing foreign firms and entry of a large number of new foreign firms. Therefore, in the new globalized business environment, pharmaceutical SMEs can no longer rely on the national market for growth and survival. The best strategy to meet an increasingly globalized competition is to progressively transnationalize the market to tap the growth opportunities exist in overseas markets.

1.3 Changing Sources of Competition

Of late, Indian pharmaceutical SMEs primarily competed on low price advantages derived from cost effective process and cheap labour cost. The Indian Patent Act 1970 has abolished product patenting for the pharmaceutical sector and Indian firms of all sizes have emerged with strong process innovation capabilities in adapting, reverse engineering and incremental improvement of a known process developed by foreign companies. In the process, Indian large and SMEs in the pharmaceutical sector demonstrated substantial price competitiveness since the cost of incremental innovation to existing process is much lower than original innovators developing the product. However, with the change in national patent regime to adopt a long duration product patent regime warranted by the World Trade Organization's (WTO) agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), the sources of competitive rivalry among firms have expanded beyond price competitiveness. New form of innovation, quality, skill and product differentiation surfaced as more important sources of competitiveness. Reverse engineering based technology strategy for all the patented products are no more feasible. SMEs are now required to focus on product innovation and undertake global standard of quality improvement like good manufacturing practices (GMP). Undertaking substantial R&D investment in-house or acquiring new technologies through merger and acquisitions (M&As) is no more a voluntary option but important for SMEs to compete and survive.

1.4 Fading Policy Protection to Chronic Infants

In India there is also a realization among policy makers very recently that a protective policy for infant firms (i.e. SMEs) aimed at insulating them from internal and external competitive forces is worse than a promotional policy aimed at helping these firms alleviate some of their resource-disadvantages (Abid Hussain Committee Report, 1997). Under the earlier protective regime like reservation of items for exclusive production in SMEs and insulation from competition imposed by imports and inward foreign companies in fact encouraged a large number of infant firms to

continue to remain infants. A number of recent policy initiatives with respect to the pharmaceutical sector reflect a shift from earlier protective regime to more of a facilitating regime. With the dilution of the DPCO, the relaxation granted to the SME sector's product is no more relevant. The permission of 100 per cent FDI and removal of the restriction on large-sized domestic firms required that pharmaceutical SMEs have to improve their competitive strength on their own rather than perpetually seeking the cover of government protection. Since 2005, firms participating in the tender for drug supplies to government hospitals are first required to have quality certifications such as GMP compliance certificate. Therefore, the low price advantages of SMEs do not reckon unless they have upgraded their manufacturing facilities to GMP and without which they may loose even their stable source of demand emanating from government procurement. Further, the compulsory industrial licensing policy for the pharmaceutical industry, which was dismantled on 23rd September 2005, used to provide preferential treatment to the small scale sector as these firms are not required to obtain industrial license if they employs less than 50/100 workers respectively with/without power[1] whereas large firms are required to do so.

The above changes in the business environment for pharmaceutical SMEs possess two implications. First, pharmaceutical SMEs are urgently required to improve their quality of manufacturing practices, product and innovation strategies to even survive in the domestic market. Second, it is important for them to enlarge their business focus from only national market to global market. Transnationalization for supplying to a diversified market and acquiring new technologies, building trading infrastructure overseas, etc., are necessary survival tools in a rapidly globalizing world market. Large scale liberalization of trade and investment regime implemented by foreign countries unilaterally and as a part of multilateral negotiations has significantly reduced trade and investment barriers in accessing overseas market since 1990s. SMEs must learn to reap benefits from such business

[1] Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, Notification No. S.O.1386. (E), September 23, 2005.

opportunities by becoming transnational entities. As SMEs, often constrained by their size limitation in management, expertise, technological assets, brand names, and having small financial resources, their internationalization process may not be assumed to be as smooth as in the case of large enterprises. SMEs' internationalization strategies hence are strongly linked with the supportive role of the home country institutions and policies. A well-designed transnationalization policy regime by the state can play an important role in supporting SMEs to access trans-border market and to source raw materials, technology, skills that are important for competitiveness but available beyond national boundary.

1.5 Data Source and Methodology of Analysis

Until now, there does not exist studies that provide a correct estimation about the size of pharmaceutical sector in India nor the exact proportion of SMEs in it. The present study has made a preliminary attempt in this direction. Utilizing the unit level information from the Annual Survey of Industries and National Sample Survey on Unorganised Manufacturing Sector, the study has arrived at the most reliable number of pharmaceutical manufacturing units that are operating in India during 2000–01 along with the volume of production, employment, and fixed assets. Moreover, based on the unpublished firm-level sources from the Prowess database, the study has estimated a set of important performance indicators like R&D, advertising, price-cost margins and profitability related to a total of 146 pharmaceutical SMEs during 15 years from 1991–2005 and presented a comparative picture with large pharmaceutical firms. Annexure 1 presents the list of pharmaceutical SMEs included in the study along with information on their sales, fixed assets, and value of plant and machinery for the latest available year.

The conceptual framework adopted in the study examines why some SMEs are able to make successful entry into international markets through exports and not others. The explanation has been sought in terms of different theories of transnationalization that have been advanced in the literature to analyze firms' transnationalization

behaviours (Chapter II). The necessary factors, as per these theories, that motivates a firm to participate in export activities are different firm-specific advantages like technologies, proprietary expertise, skills, etc. These traditional determinants of transnationalization are mostly discussed in the case of large firms. In contrast to large firms, such firm-specific assets bundles at the disposal of SMEs are predicted to be limited. The basic question, considered in Chapter IV, concerns to what extend these explanatory variables are still valid for SMEs. The methodology of censored regression was adopted to analyze the export behaviour of a total of 144 pharmaceutical SMEs during 1991–2005 (See Annexure 1). This econometric tool is found to be more appropriate to the traditional method like Tobit that is predominant in the existing export literature.

Apart from undertaking pioneering attempt in estimating the size of SME sector in pharmaceutical industry and adopting improved methodology to the analysis of SMEs' export behaviour, this study has contributed significantly in the understanding of Indian pharmaceutical SMEs' export behaviour through case study approach. It has successfully brought out various lessons that Indian pharmaceutical SMEs are required to be aware when transnationalizing their businesses. In order to supplement the analysis, we also contacted a group of ten firms for further understanding of their problems in undertaking export activities.

Since this study is more about the ways to encourage effective participation of SMEs in international markets, the primary focus is confined to their export activities. Several other issues such as contract research and manufacturing (CRAMs), inward FDI, implementation of Schedule M, etc., are equally important for the SME sectors but have not been elaborately discussed in the report.

1.6 Layout of the Report

This study is concerned mainly with the subject of transnationalization of pharmaceutical SMEs and thus is of interest to policy makers and small pharmaceutical firms. It explores the role of different factors in encouraging SMEs to undertake export activities and shall attempt to identify critical areas of policy interventions that can help these SMEs to transnationalize through exports. In Chapter I the subject of internationalization has been introduced. The later part of the chapter spells out the data sources, methodology and lay out of the study. Chapter II discusses various possible modes of transnationalization and gives an overview of theories of transnationalization dealing with two selected modes, namely, exports and outward foreign direct investment (FDI). The size and performance of Indian pharmaceutical SME sector across different dimensions like technology, product differentiation, market power, profitability, etc., are analyzed in Chapter III. It also presents the issue of data availability on pharmaceutical SMEs, their definition and identification. Chapter IV examines the export performance of pharmaceutical SMEs and frames a suitable empirical methodology to determine various factors affecting their export behaviour. Empirical results obtained from the quantitative analysis are also provided and interpreted in this Chapter. It also explores the possibility of outward FDI by Indian pharmaceutical SMEs and presents statistics on their outward FDI for recent years. In Chapter V case studies of selected six pharmaceutical SMEs are undertaken to further understand their export behaviour with emphasis on firm-specific strategies towards domestic and international markets. Moreover, it also presents brief case studies of four SMEs that have recently transnationalized through trans-boarder investment. Chapter VI critically evaluates the role of government policies and underlines areas that need to be focused for effectively promoting transnationalization efforts of SMEs. Chapter VII, the concluding one summarizes the main points and policy recommendations emerging from the study.

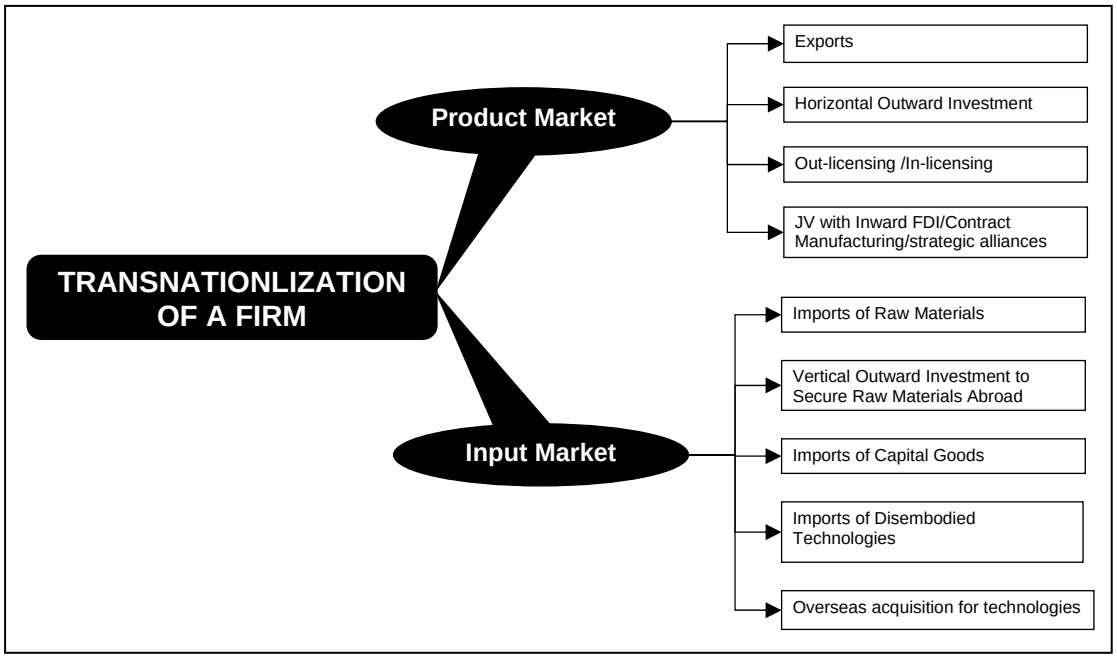
Chapter II

TRANSNATIONALIZATION OF SMEs: THEORETICAL BACKGROUND

2.1 Modes of Transnationalization

The process of transnationalization of a small- and medium-sized enterprise (SME), similar to their large counterpart, can be conceptualized as a set of processes by which firms' business activities get connected to the transnational market. These transnationalization processes can be undertaken through both product and input markets. Figure-2.1 summarizes the important modes of transnationalization of an SME.

Figure-2.1
Different Modes of Transnationalization



The product-market driven transnationalization occurs when an SME decides to supply to the foreign market through exporting or through undertaking outward FDI (OFDI) to produce final products in the foreign market and/or establish trade-supporting networks to expand its export activities. Transnationalization can also

take place when SMEs license out their products or firm-specific advantages to foreign firms operating in the domestic or foreign market, or enter into a joint venture or engage in contract manufacturing. OFDI in the form of overseas acquisitions represents an alternative mode of transnationalization where an SME get an easy access to foreign markets by acquiring a foreign company in the same line of business.

The input-market driven transnationalization of an SME can also be seen in different ways. An SME can import raw materials, inputs and capital goods or can undertake OFDI to acquire supply source of raw materials in foreign market. An SME can also adopt the option of in-licensing technology contract with a foreign firm to get access to latter's technologies and/or adopt acquisition route to obtain overseas technology and skills.

Therefore, SMEs have a spectrum of transnationalization possibilities as represented in Figure-2.1. Which particular strategy or a combination of more than one strategies will actually be adopted by an SME depends upon its resources, firm-specific capabilities and management attitudes.

While all the transnationalization strategies are important for SMEs' growth, survival and competitiveness, the present study is predominantly concerned with only two modes of product-market based transnationalization, namely, exports and OFDI. In the traditional literature on internationalization, most often exporting is represented as the early stage in the transnational expansion of a firm (Newbould, Buckley and Thurwell, 1978; Buckley, 1989). The transnationalization strategy of exporting enables an SME hitherto producing and supplying within the domestic market to exploit market opportunities in the foreign countries. In this case the production facilities of the SME still lies within the physical boundary of the home country but the market focus gets enlarged to include overseas consumers.

An SME can supply its product to the potential customers in the targeted foreign market directly by shipping its products to the identified foreign customer or indirectly supplying through export intermediaries like trading companies,

commissioned third-party agencies or other companies having export distribution networks. Direct exporting involves relatively larger in-house responsibilities of SMEs in determining the targeted foreign market through market research, identifying potential foreign customers, arranging for export financing and logistics (e.g., packing, insurance, invoices, export documentation, etc.) and implementing necessary legal procedures. Although some parts of the export activity are now performed by export intermediaries in the case of indirect exporting, SMEs suffer from sharing their export profits with intermediaries and most importantly loosing control over the way in which their products are marketed, serviced and priced in the foreign markets.

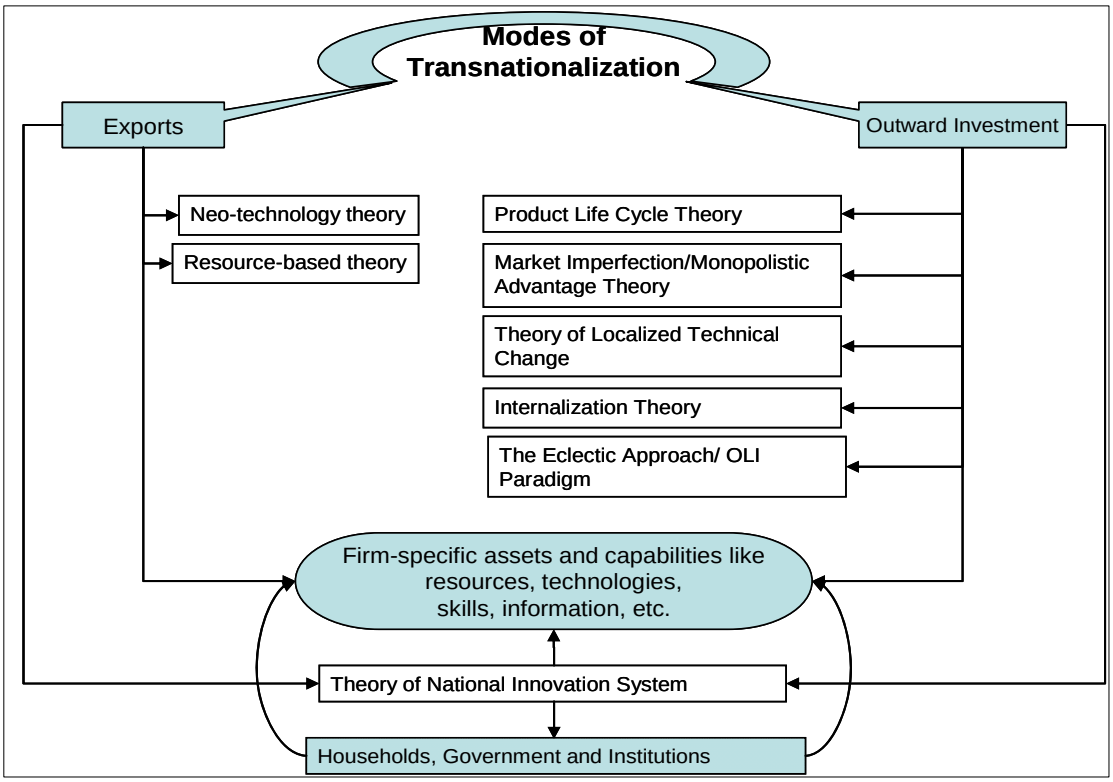
The transnationalization strategy of outward direct investment involves cases where trans-border expansion of an SME's business activities takes place through direct investment in foreign countries. As compared to exports, outward investment is a more risky transnationalization strategy for SMEs and involves relatively large quantum of resources and a relatively lengthier time period for realization of return on investment. In view of the huge resources involved in OFDI, only a small minority of SMEs can be expected to undertake this particular mode of transnationalization. There are a number of forms that OFDI can take—building off-shore marketing infrastructure represented by a sales subsidiary, overseas production represented by a manufacturing subsidiary, entering into a joint venture with local firms for marketing and/or manufacturing, and acquiring companies abroad represented by a brownfield subsidiary. Each of these forms of OFDI has its own benefits and costs and an SME chooses the appropriate one that can maximize the gains with minimum costs given its capabilities and resources.

2.2 Theories of Transnationalization

The dominant transnationalization theories that explain firms' exports and OFDI activities tend to converge on the basic point that firm-specific technological, skill, product differentiation and resource capabilities are the main driving forces for a

firm's participation in international market (Figure-2.2). A brief discussion on these theories is provided below.

Figure-2.2
Theories of Transnationalization of Firms



2.2.1 Exports

The theoretical framework on which majority of empirical studies dealing with firm level export activities are based on neo-technology theories of international trade. These theories suggest that international trade involving large number of products is a function of technical change, innovation and firm-specific technological capabilities. Posner (1961) ascribes trade flows to inter-country differences in the dynamics of technology creation and imitation. The introduction of a new product or a new process in an industry in one country leads to a temporary monopoly of innovating country in trade until other non-innovating countries imitate and bridge the technological gap. In the product life cycle model of Vernon (1966), a new product that emerges based on innovation in advanced countries goes through different stages of its life cycle. Initially the new product is introduced and

manufactured in the innovator country and exporting takes place when demand get diffused to other non-innovating countries. After a certain period, firms in foreign countries eventually imitate the technology with the product becoming standardized and matured, thus competing with firms from innovator countries.

Recently, the growing literature on resource-based theory (Penrose, 1959; Barney, 1991; Connor, 1991) interprets firms as embodiment of accumulated resources. These resources not only include technological assets but physical (i.e. plant, equipment, inventory, etc.), financial (i.e. cash, credit, etc.), *human* (i.e., entrepreneur, labor and management) and social resources (i.e. networks and relationships) as well (see Hart, Brush and Greene, 1997 for a review). These resources enable the owner firm to enjoy and exploit competitive advantage in domestic and external markets over a period of time until competitors imitate or substitute such resources.

There exists another strand of literature that theorizes firms' transnationalization process as an incremental, stepwise and gradual process of increased foreign involvement where export dominates some intermediate stage of foreign expansion (Johanson and Wiedersheim-Paul, 1975; Newbould, Buckley and Thurwell, 1978; Buckley, 1989; Johanson and Vahlne, 1977, 1990). The Uppsala model of internationalization suggests that purely domestic firms' foreign involvement begin from irregular export activities and then move into a systematic phase of exporting through export agents. Then the firm goes on into further and higher stages of internationalization in successive manner from establishing its own overseas sales subsidiary to overseas manufacturing subsidiary (Johanson & Wiedersheim-Paul, 1975). In the earlier stages of internationalization, firms may not be able to commit more resources for foreign involvement as they have low knowledge base on foreign markets and apprehension of high risks. As they proceed from one stage to another they accumulate actual knowledge and expertise in dealing with foreign markets and slowly learn to devise measures against possible risks. Although these stage theories are quite useful in describing firms' international involvement but in a globalized environment a growing number of firms across industries are emerging with immediate international involvement. These new firms are 'born global' with instant

exports and their internationalization processes thus can't be explained in incremental step-wise stages (Rennie, 1993; Andersson and Wictor, 2003; Oviatt and McDougall, 1995; among others).

All the theories discussed above, tend to visualize firm-specific capability formation—the critical factor for the origin of exports, as a function of firms individual innovative efforts. However, firms are just one among several 'agents of innovation' and their innovative activities closely depend upon the function of other agents like government, households, and institutions (Pradhan, 2007c). The theory of national innovation system (NIS) emphasizes that innovation is a function of complex and dynamic interactive process among these agents that generate or facilitate the creation of new commercial knowledge effecting changes in product, process, or services (Lundvall, 1985, 1992; Freeman, 1988; Nelson, 1993; OECD, 1997). Households play a major role in innovation by supplying skilled manpower in the labour market and providing entrepreneurs to take risk to start productive enterprises. The role of Government is most crucial as it not only directly establishes public sector firms engaged in innovation and public sector research laboratories and centres but also influences the innovation functions of other agents like private firms and households. Government can influence R&D activities of private firms by providing fiscal incentives and necessary infrastructure and can influence households to send their members for higher and specific skills by establishing universities, technology institutions etc. Transparent, efficient and democratic political, financial, judicial and governance institutions always play a facilitating role in encouraging human creativity and innovation. Therefore, NIS provides a broader framework to understand firms' capabilities which ultimately lead their transnationalization efforts like exporting or outward FDI (Pradhan, 2007c).

2.2.2 Outward Investment

In the product life cycle theory, outward FDI emerges as a suitable global strategy for innovator firms based in developed countries when the product technology become standardized and developing countries firms emerge as strong competitors

exploiting cost advantages. Overseas production in developing countries ensures innovator firms to remain competitive in developing countries market by exploiting cheap labour costs, eliminating transport cost involved in exporting from home and overcoming trade barriers erected by host countries. This theoretical framework, however, possesses limited explanatory power to explain the rise of knowledge-based outward FDI from developing countries and which is also increasingly being directed at developed countries (Pradhan, 2004).

Following the initial contribution of Hymer (1960) a leading theory of FDI has emerged that explains outward FDI as a function of firm-specific monopolistic advantages derived from an array of intangible assets like a unique product, superior skills, powerful product differentiation, higher managerial abilities, etc (Kindleberger, 1969; Caves, 1971). These advantages exist due to imperfections in the market with firm-specific heterogeneity in access to these strategic assets. Any firm undertaking FDI must possess a set of these advantages to gain an edge over local competitors in the host countries and to cover the cost of managing a cross-border business.

With the rise of developing country firms as outward investors in late 1970s, a body of literature emphasized that there are distinct differences in the sources of monopolistic advantages owned by direct investors in developing and developed countries. These studies emphasized that developing country overseas investors in overwhelming cases have competitive advantages in those sectors marked by price competition rather than sophisticated technological and product differentiation advantages (Kumar and McLeod, 1981; Well, 1983; Lall, 1983). Lall (1983) proposes the theory of localized tehnological change to explain the emergence of developing country outward investors. He argued that developing country firms can have ownership advantages over developed country firms because of their ability to create unique proprietary intangible assets based on relatively lower level of research efforts and skills. Initially these proprietary assets were suitable to operate in developing country market conditions and hence in late 1970s–1980s majority of developing country outward FDI was directed at fellow developing countries.

However, due to significant public sector investment in skill creation, physical and technological infrastructure building, and higher economic growth over past decades, the 1990s witnessed a significant improvement in the localized technological change taking place in developing countries thus leading to creation of those proprietary assets that are exploitable even in developed country business environment (Pradhan, 2004).

The internalization theories seek to provide answer to a firm's preference to exploit its monopolistic advantages abroad through FDI than opting for alternatives like exporting from home country or out-licensing these advantages to a third party in the host country (Buckley and Casson, 1976; Teece, 1985; Rugman, 1980). A firm is anticipated to maximize the revenue productivity of its intangible assets by internalizing them through overseas production. This strategy enables firms to overcome existing trade barriers and eliminate high transportation costs involved in exporting. Out-licensing is not an attractive strategy because of high transaction costs involved in search, negotiation and implementation of technology contracts. This strategy also involves loss of strategic control over firm-specific intangible assets and further even fails in the case of many components of these assets like marketing and production skills embodied in employees which are not amenable to the medium of licensing.

Dunning (1980, 1988) proposed an eclectic framework for explaining the outward FDI decision of national firms. Apart from being motivated to exploit ownership and internalization advantages as suggested by earlier theories, outward investing firms are also predicted to be seekers of locational advantages offered by host countries. A host country that offers relatively better locational advantages like large market, high growth, good infrastructure, less policy hurdles on doing business, etc., as compared to other competing locations would attract more outward investing firms.

Similar to the theoretical approaches on exports, theories dealing with OFDI decision of national firms tend to concentrate only on firm-specific intangible and tangible advantages that firms must possess to transnationalize but lack broader insight into

how these advantages emerge in the first place. The NIS framework provides a strong theoretical justification for government facilitating actions for transnationalization of national firms as also for analyzing the role of other agents of innovation like households and institutions (Pradhan, 2007c).

2.3 Implications for SMEs' Transnationalization

The above discussion on reviews of theories suggests that the essential condition for transnationalization of firms is that they must posses a set of firm-specific intangible and tangible resources like unique products, managerial capability and skills, brands, marketing experience, information, etc. These competitive advantages are developed and exploited by firms in their domestic market to start with and then transnationalize their operations to exploit them in international markets. Generally, these firm-specific resources are positively dependent upon firm size, i.e., large-sized firms are likely to possess these resources abundantly as compared to SMEs. Small firms, notwithstanding their most important competitive asset—organizational and managerial flexibility, operate with a number of constrains imposed by their small size. They operate with low level of technology, managerial capabilities, lack of information on market opportunities (both abroad and home) and government incentives, low skill, etc. The biggest disadvantage these firms are identified with is lack of sufficient finance to expand internally and to perform exports or other form of transnationalization.

When SMEs operate with several limitations, obviously they are likely to have less inclination for adopting the risky, complex and uncertain strategy of transnationalization. However, lower propensity of SMEs to participate in international market should not be interpreted as their incapability to transnationalize. Even with their low level of technological activities SMEs have niche products, though they may not have a large product portfolio as possessed by large-sized firms. When these SMEs compete successfully with large firms in the domestic market, they can replicate the same in international market provided they get access to financial and informational resources.

Thus, government has a crucial to play in helping SMEs to enhance their transnationalization capabilities by providing training in international business, information, finance, and supporting their technological dynamisms. Once these firms successfully transnationalize they have higher chances of autonomous international expansion with less dependence on basic support from government. Developing countries like India, that have opened up their economies to international competition without building suitable transnationalization capabilities of their SMEs, are required to put in place a systematic and definite support strategy to help SMEs upgrade their competitive capabilities to operate in international markets.

Chapter III

DEFINITION, DATABASE AND PERFORMANCE OF PHARMACEUTICAL SMEs

3.1 Definition of SMEs

Since 1966 the policy definition of small scale industries (SSI) in India is based on a critical value of gross investment in plant and machinery with continued upward revision in the critical limit. The upper cut-off value of plant and machinery for the pharmaceutical SSI, which was same as that for general SSI in India, has gone up from Rs. 1 million in 1975–76 to Rs. 2 million in 1980–81 and then to Rs. 10 million in 1999–00 (Table-3.1). From June 2003 onwards, the critical limit for pharmaceutical SSI has been revised to Rs. 50 million. In October 2006, the Government of India has enacted a new Act known as Micro, Small and Medium Enterprise Development (MSMED) Act, 2006. For the first time the Indian industrial policy regime provided a standardized definition for medium scale industries along with that of small scale sector. A manufacturing enterprise with an investment in plant and machinery up to Rs. 25 lakh is defined as a micro enterprise; with an investment of above Rs. 25 lakh and up to Rs. 5 crore is defined as small scale sector unit; and with an investment of above Rs. 5 crore and up to Rs. 10 crore is defined as medium scale sector unit.

The present study has adopted the government specified current critical limits to define pharmaceutical SMEs, although the present criterion suffers from some apparent limitations. The most obvious drawback of this standard classification is its inability to take into account sector-specific dynamics. Applying the same level of productive investment to diverse manufacturing activities to identify small enterprises is clearly unsatisfactory. For example, the capital requirement for starting a small textile unit may be far less than what is required for a SSI operating in highly capital intensive metallurgical industries. The classification of a higher limit for SSI in non-capital intensive industries permits many relatively large-sized enterprises

siphoning off the policy benefits which are actually meant for small scale units. The definition of small scale or medium scale units should be based on actual distribution of firms in an industry on a size parameter like investment in plant and machinery. This would ensure a more meaningful critical limits for SMEs specified for a particular sector.

Table-3.1
Critical Upper Limits for Identifying Pharmaceutical SMEs in India, 1966–2006

Year	Original Value of Investment in Plant and Machinery (Rs. Million)				
	SSI	Ancillary	Tiny	EOU	Medium Enterprise
1966–67	0.75	1.0			Not Defined
1975–76	1.0	1.5			Not Defined
1980–81	2.0	2.5	0.2		Not Defined
1985–86	3.5	4.5	0.2		Not Defined
1991–92	6	7.5	0.5	7.5	Not Defined
1997–98	30	30	2.5	30	Not Defined
1999–2000	10	10	2.5	10	Not Defined
June 2003	50	10	2.5	10	Not Defined
September, 2006	50	10	2.5	10	100

Source: (i) SIDBI (2002) Report on Small Scale Industries Sector 2001, Lucknow, India; (ii) Government of India (2004) Union Budget 2003–2004, New Delhi; (iii) Government of India (2006) MSME Development Act, 2006 - Notifying the Micro. Small and Medium Enterprises, New Delhi.

3.2 Dataset on Pharmaceutical SMEs

In India, a comprehensive database on Indian pharmaceutical firms covering all the required variables for the present analysis is not available. Therefore, the study has drawn upon a number of data sources given the specific research objectives. For estimating the actual size of Indian pharmaceutical industry with information on SMEs, the study has utilized information from two sources, namely the Annual Survey of Industries (ASI) and National Sample Survey Organization (NSSO).The ASI unit level database covers only those pharmaceutical units that are registered under the Factories Act 1948. By definition, these units must be employing at least 10 workers using power and 20 workers without using power. Therefore, ASI covers just the organized segment of the pharmaceutical sector. The National Sample Survey Organization (NSSO) unit level data on unorganized manufacturing sector provides information on really small pharmaceutical units that are not covered by the ASI source. Although these two sources provide unit level data on standard variables like number of units, production, employment, value of fixed asset in plant

and machinery, investment, etc., they neither provide information on firms' export activities nor on technological parameters like R&D efforts. Further, they do not reveal firms' name due to the confidentiality clause in their surveys. However, the central focus of this study is on identifying SMEs in the pharmaceutical sector for conducting interviews and case studies, thus, availability of individual firms' names is important for the present study. In view of these limitations, both these two sources have been utilized only to estimate the size of the SME sector in the pharmaceutical industry and their contribution to total pharmaceutical output, employment and investment.

The available firm level sources like the Prowess database of the Centre for Monitoring Indian Economy (CMIE) or Capitaline database of Capital Market Publishers India Limited primarily cover listed companies in Indian capital market with a few unlisted companies. Although the coverage of these databases is quite limited as compared to the ASI but they provide information on firm names and many technological variables like R&D investment, royalty and technological payment made abroad, etc. The present study has utilized the Prowess database for estimating technological and product differentiation indicators for comparing the performance of pharmaceutical SMEs and large firms.

Further, since 2000, the CMIE in collaboration with the Department of Company Affairs is bringing out a comprehensive database known as 'First Source' on financial accounts of Indian companies compiled from available annual reports of companies with the Registrar of Companies. Between March 1999 and March 2003, financial accounts of over two lakh sixty thousands (2,60,000) Indian companies became available and two versions of First Source have been released in 2000 and 2004. The present study also utilizes this larger dataset on Indian pharmaceutical companies to identify names of SMEs for undertaking interviews and case studies.

From this database we have collected information on total income, gross fixed assets, profit before tax, salaries and wages, paid-up capital, etc., for a total of 1027 Indian pharmaceutical companies for the year March 2000. Some company data from March

1999 and March 2001 were supplemented in the case of unavailability of data for the year March 2000. Of the total 1027 companies, about 236 companies are identified to be registered members of the Pharmaceuticals Export Promotion Council (Pharmexcil) of India. The study, as mentioned earlier, has adopted the current definition of SMEs suggested by the Micro, Small and Medium Enterprise Development Act, 2006. Due to unavailability of breakup of gross fixed assets into plant and machinery and other fixed assets in the First Source dataset, the value of gross fixed asset has been utilized in place of plant and machinery. Firms with a historical value of gross fixed asset up to Rs. 5 crore are defined as small firms and those with above Rs. 5 crore and up to Rs. 10 crore are termed as medium firms. The residual category of firms i.e. those with gross fixed asset of above Rs. 10 crore are the large-sized firms.

3.3 Size, Performance and Identification of SMEs

3.3.1 Size of the SME Sector

Table-3.2 provides a brief description about the total size of the Indian pharmaceutical industry based on Annual Survey of Industries (ASI) and NSSO and a comparison of the importance of SMEs vis-à-vis large pharmaceutical enterprises in terms of number of units, workers, gross fixed assets and gross value added. As on March 2001, the Indian pharmaceutical industry has an estimated 16, 326 operating units with an aggregate gross fixed asset of Rs.1, 658 billion and a gross value added of Rs. 583 billion. The industry has employed about a total of 2.5 lakh workers.

The industrial structure of Indian pharmaceutical industry is clearly dominated by the unorganized sector units. These unorganized units are very small units employing less than 10 workers (with use of electricity) or 20 workers (without use of electricity) and are not covered in the Factories Act, 1948. These units account for 83 per cent of total units in Indian pharmaceutical sector and contributed about 41 per cent of the total workers employed in 2000–01. These unorganized units are using

highly labour-intensive technologies with just Rs. 28,959 of fixed asset available per worker and operating with very low level of investment as reflected in just Rs. 2 lakh of the gross fixed asset per unit. As a result of heavy labour using technologies, the labour productivity of these unorganized units is very low. Given their nature of production process, it is not surprising to find that these unorganized small firms account for only 1.8 per cent and 2 per cent of industry fixed asset and gross value added respectively.

Table-3.2
Size Classification of Indian Pharmaceutical Sector, 2000–01

Characteristics	Unorganized	Organized				Total Sector			
	Small Units	Small Units	Medium Units	Large Units	All Units	Small Units	Medium Units	Large Units	All Units
No. of units (numbers)	13480 (82.6)	2607 (16.0)	116 (0.7)	123 (0.8)	2846 (17.4)	16087 (98.5)	116 (0.7)	123 (0.8)	16326 (100)
Workers (numbers)	101773 (41.2)	90827 (36.8)	14502 (5.9)	39918 (16.2)	145247 (58.8)	192600 (78.0)	14502 (5.9)	39918 (16.2)	247020 (100)
Gross Fixed Asset (Rs. Lakhs)	29472 (1.8)	392171 (23.7)	156527 (9.4)	1079417 (65.1)	1628115 (98.2)	421643 (25.4)	156527 (9.4)	1079417 (65.1)	1657587 (100)
GVA (Rs. Lakhs)	12196 (2.1)	217696 (37.3)	88384 (15.2)	264853 (45.4)	570933 (97.9)	229892 (39.4)	88384 (15.2)	264853 (45.4)	583129 (100)
Mimeo Items									
Worker Per Unit (Number)	7.5	34.8	125.0	324.5	51.0	12.0	125.0	324.5	15.1
Gross Fixed Asset Per Unit (Rs Lakh)	2	150	1349	8776	572	26	1349	8776	102
GVA Per worker (Rs. Lakh)	0.12	2.40	6.09	6.63	3.93	1.19	6.09	6.63	2.36
Capital Labour Ratio (Rs. 1000)	29	432	1079	2704	1121	219	1079	2704	671

Note: Small Units—Gross Plant and Machinery value up to Rs. 5 crore; Medium Units—Gross Plant and Machinery value above Rs. 5 crore and up to Rs. 10 crore; Large Units—Gross Plant and Machinery value above Rs. 10 crore; Percentage share of Total Sector (All Units) are in parenthesis.

Source: Computation based on unit level data of Annual Survey of Industries 2000–01 and NSSO Survey on Unorganized Manufacturing Sector 2001

As compared to the unorganized small units, the organized sector small units are relatively more capital-intensive and demonstrate higher labour productivity. The gross fixed asset per unit is Rs. 1.5 crore for the organized small units which is 75 times that of unorganized small units. The organized small units generate a per worker value added of Rs. 2.4 Lakh. An estimated 2, 607 organized small units are in the pharmaceutical sector (about 16 per cent of total sectoral units) accounting for about 37 per cent of total workers employed in the pharmaceutical industry.

The small units in unorganized and organized segments together comprised of 98.5 per cent of total units in Indian pharmaceutical industry in 2000–01 and accounted for about 78 per cent, 25.4 per cent and 39 per cent respectively in industry worker, gross fixed asset and gross value added. There are just a total of 116 medium units accounting for about 6 per cent of industry employment and 15 per cent of gross value added. An estimated 123 units are large enterprises, which account for 16 per cent of industry workers, much higher than the employment share of medium enterprises. Large units disproportionately account for 65 per cent of industry fixed asset and 45.4 per cent industry gross value added.

The above findings suggest that small units are predominant feature of industrial structure in the Indian pharmaceutical industry with a small group of medium and large firms.

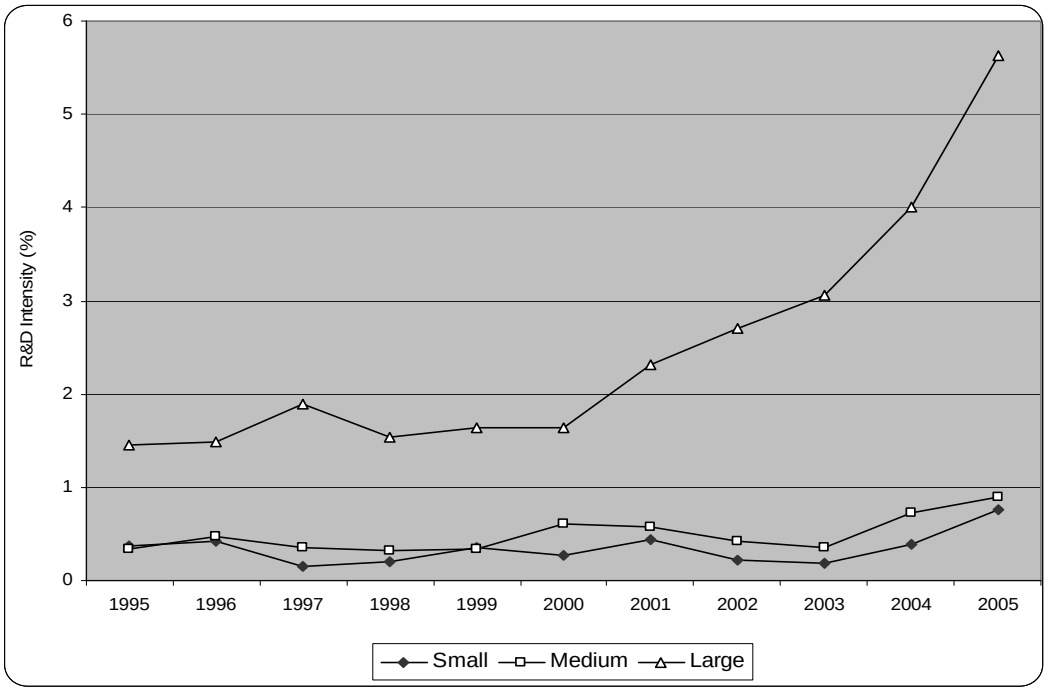
3.3.2 Technology Performance of SMEs

As mentioned earlier the data sources of ASI and NSSO do not provide any parameters related to the technological or product differentiation activities of firms. As the role of technology is increasingly becoming critical for firms' survival in the post product patent regime, the study draws upon the firm level database of the Prowess to get some broad trends among small, medium and large pharmaceutical firms. Information about a total of 283 pharmaceutical firms were extracted from the Prowess database and using the value of plant and machinery for latest available year during 2000–01 to 2004–05 for each firm, SMEs were classified as per the current definition prescribed by the MSMED Act 2006. Of these 283 firms, 107 are small, 39 are medium and the remaining (137) are large pharmaceutical firms unbalancedly distributed over different years.

Table-3.3 and Figure-3.1 summarize R&D performance of Indian pharmaceutical firms during 1991–2005. The most worrying fact is that R&D activities of small and medium pharmaceutical firms consistently remained at lower levels whereas large firms have significantly pushed their innovative activities in the run up to the post

product patent regime. The R&D intensity of large firms increased from just 0.15 per cent in 1991 to 5.6 per cent in 2005 whereas that of small and medium firms' floats below 1 per cent. Moreover, R&D-undertaking firms constitute about just 18 per cent among small firms and 32 per cent among medium firms whereas they account for 52 per cent among large firms. This suggests that SMEs are lagging far behind their large counterparts in terms of both R&D intensity and proportion of R&D-undertaking firms.

Figure-3.1
R&D Intensity of Firms in Indian Pharmaceutical Industry, 1995–2005



The low level of in-house technological efforts by pharmaceutical SMEs, which is largely due to their resource limitation, is surely going to be a major deterring factor for their survival and growth in the coming years. Developing in-house technological strength by SMEs is required not only for improving and updating their firm-pacific know-how but also for absorbing externally available knowledge from sources like public sector research laboratories and universities and for benefiting from spillovers effects of technological activities done by large firms. It appears that in-house R&D is a critical barrier for Indian pharmaceutical SMEs' growth and transnationalization.

Table-3.3
Firms' R&D Performance over sizes, 1991–2005

Year	Small Firms					Medium Firms					Large Firms				
	Number			R&D (In Rs. Crore)	R&D Intensity (%)	Number			R&D (In Rs. Crore)	R&D Intensity (%)	Number			R&D (In Rs. Crore)	R&D Intensity (%)
	Total	R&D-performing	% share of R&D Firms			Total	R&D-performing	% share of R&D Firms			Total	R&D-performing	% share of R&D Firms		
1991	9	2	22.2	0.05	0.02	5		0.0	0	0	46	3	6.5	5.13	0.15
1992	14	4	28.6	0.96	0.27	8		0.0	0	0	52	11	21.2	8.88	0.22
1993	22	7	31.8	1.42	0.30	13	5	38.5	0.59	0.20	59	29	49.2	48.06	0.92
1994	39	4	10.3	1.43	0.27	18	7	38.9	1.42	0.40	77	41	53.2	89.36	1.46
1995	63	7	11.1	2.72	0.37	24	7	29.2	1.28	0.34	87	48	55.2	116.42	1.45
1996	72	12	16.7	3.83	0.43	24	10	41.7	2.33	0.47	92	49	53.3	142.42	1.49
1997	62	12	19.4	1.43	0.15	24	8	33.3	1.89	0.36	93	57	61.3	225.26	1.88
1998	69	9	13.0	1.76	0.20	24	8	33.3	1.86	0.31	96	55	57.3	207.7	1.54
1999	77	11	14.3	3.52	0.35	23	9	39.1	2.88	0.35	105	61	58.1	272.43	1.63
2000	81	13	16.0	3.6	0.27	27	10	37.0	6.1	0.60	110	59	53.6	318.68	1.65
2001	83	12	14.5	6.59	0.43	31	9	29.0	6.46	0.57	117	68	58.1	517.11	2.32
2002	80	13	16.3	3.37	0.22	28	11	39.3	4.36	0.43	116	73	62.9	690.83	2.71
2003	86	15	17.4	2.89	0.18	31	11	35.5	4.67	0.35	119	70	58.8	886.6	3.06
2004	83	15	18.1	7.21	0.38	27	13	48.1	10.04	0.72	125	80	64.0	1393.76	4.01
2005	62	13	21.0	9.54	0.75	22	9	40.9	11.44	0.90	107	75	70.1	1933.58	5.62
All Above Years			18.0*	50.32	0.33			32.3*	55.32	0.50			52.2*	6856.22	2.81

Note: * indicate average over years.
Source: Prowess Database (2007), CMIE.

Apart from in-house R&D, new knowledge can be procured through technology licensing or investing in new capital goods embodying new processes. Table-3.4 and Table-3.5 present statistics on Indian pharmaceutical firms' technological spending on foreign- disembodied technologies and imports of capital goods and machinery, both as a per cent of total sales. Both for large and small pharmaceutical firms the ratio of spending on foreign technologies to sales is very marginal reflecting the fact that these firms do not seem to rely on foreign technologies, possibly due to the existence of a strong domestic base in the process technologies for bulk drugs and generic segment. SMEs are also found to comparatively spend less in importing new capital goods whereas large firms have consistently increased their expenses as a proportion of total sales.

Table-3.4
Firms' Overseas Technological Payment Intensity over size, 1995–2005

Year	Overseas Technological Payment Intensity (%)		
	Small	Medium	Large
1995	0.260 (63)	0.000 (24)	0.130 (87)
1996	0.225 (72)	0.012 (24)	0.140 (92)
1997	0.217 (62)	0.012 (24)	0.105 (93)
1998	0.248 (69)	0.057 (24)	0.152 (96)
1999	0.242 (77)	0.065 (23)	0.139 (105)
2000	0.199 (81)	0.080 (27)	0.139 (110)
2001	0.001 (83)	0.074 (31)	0.135 (117)
2002	0.011 (80)	0.082 (28)	0.046 (116)
2003	0.087 (86)	0.000 (31)	0.055 (119)
2004	0.045 (83)	0.014 (27)	0.047 (125)
2005	0.005 (62)	0.012 (22)	0.036 (107)
All Above Years	0.115	0.038	0.086

Note: Number of firms in parenthesis.
Source: Prowess Database (2007), CMIE.

Overall these technological indicators suggest that SMEs have hardly spent any substantial per cent of their sales on R&D or importing embodied and disembodied forms of foreign technologies and the pattern of their innovation spending did not vary much even in the first half of 2000s. Whereas as compared to SMEs, large firms

have been consistently pushing up their technological expenses in in-house R&D efforts as well as importing modern plant and machineries.

Table-3.5
Firms' Imported Capital Goods Intensity over size, 1995–2005

	Imported Capital Goods as a per cent of sales (%)		
Year	Small	Medium	Large
1995	0.011 (63)	0.066 (24)	1.904 (87)
1996	0.053 (72)	0.157 (24)	1.100 (92)
1997	0.005 (62)	0.025 (24)	1.565 (93)
1998	0.042 (69)	0.101 (24)	1.448 (96)
1999	0.083 (77)	0.012 (23)	0.887 (105)
2000	0.055 (81)	0.067 (27)	0.510 (110)
2001	0.200 (83)	0.254 (31)	0.743 (117)
2002	0.012 (80)	0.013 (28)	0.741 (116)
2003	0.017 (86)	0.030 (31)	1.014 (119)
2004	0.029 (83)	0.169 (27)	1.215 (125)
2005	0.807 (62)	0.236 (22)	2.076 (107)
All Above Years	0.123	0.113	1.187

Note: Number of firms in parenthesis.
Source: Prowess Database (2007), CMIE.

3.3.3 Product Differentiation Activities of SMEs

Among non-price strategy of competitiveness, pharmaceutical SMEs are required to perform large scale product differentiation activities like advertising and marketing as the pharmaceutical industry is a highly advertising-intensive industry. Table-3.6 and Figures-3.2 and -3.3 provide advertising and marketing expenses undertaken as a per cent of sales for SMEs and large pharmaceutical firms. The advertising intensity of small firms is observed to have a downward trend since 1995 whereas that of medium firms has grown significantly. Large firms' advertising intensity has fluctuated within 1-2 per cent range during 1991–2005. This shows that advertising intensity is related to firm size in an inverted U-shape curve with a progression from lower advertising intensities of small firms to higher advertising intensities of medium firms and again relatively lower advertising intensities of larger firms. It can

Table-3.6
Advertising and Marketing Intensity of Indian Pharmaceutical Firms, 1991–2005

Year	Small Firms		Medium Firms		Large Firms	
	ADV	MKT	ADV	MKT	ADV	MKT
1991	1.1 (9)	0.67 (9)	0.79 (5)	10.51 (5)	1.67 (46)	4.26 (46)
1992	0.84 (14)	0.54 (14)	0.52 (8)	7.75 (8)	1.53 (52)	4.27 (52)
1993	0.88 (22)	1.25 (22)	0.48 (13)	7.65 (13)	1.52 (59)	4.12 (59)
1994	1 (39)	0.79 (39)	0.52 (18)	8.79 (18)	1.46 (77)	4.22 (77)
1995	1.42 (63)	1.03 (63)	0.54 (24)	10.48 (24)	1.53 (87)	4.31 (87)
1996	1.3 (72)	1.11 (72)	0.61 (24)	9.28 (24)	1.31 (92)	3.96 (92)
1997	1.25 (62)	1.42 (62)	0.83 (24)	6.79 (24)	1.14 (93)	4.31 (93)
1998	1.38 (69)	1.88 (69)	0.95 (24)	6.01 (24)	1.37 (96)	4.7 (96)
1999	1.31 (77)	2.23 (77)	0.84 (23)	7.18 (23)	1.23 (105)	3.96 (105)
2000	0.86 (81)	3.17 (81)	3.85 (27)	7.32 (27)	1.19 (110)	4.48 (110)
2001	0.81 (83)	3.86 (83)	4.71 (31)	8.62 (31)	1.14 (117)	4.46 (117)
2002	0.11 (80)	4.84 (80)	1.48 (28)	9.33 (28)	1.08 (116)	4.75 (116)
2003	0.47 (86)	4.98 (86)	5.12 (31)	8.21 (31)	1.37 (119)	4.73 (119)
2004	0.78 (83)	5.3 (83)	5.23 (27)	7.83 (27)	1.32 (125)	4.74 (125)
2005	0.09 (62)	4.86 (62)	5.26 (22)	7.58 (22)	1.6 (107)	4.4 (107)
All Above Years	0.81	3.28	3.13	8.04	1.32	4.48

Note: ADV- Advertising expenses as a per cent of sales; MKT- Marketing expenses as a per cent of sales; Number of firm is in parenthesis.
Source: Prowess Database (2007), CMIE.

be argued that the advertising requirement of smaller pharmaceutical firms are very high because they are unknown in the market place and have to create a brand name for their products whereas large firms are quite well-known and have good names and thus need to spend a smaller proportion of their sales on advertising. However, the relatively low share of advertising expenses in totals sales of small pharmaceutical firms also suggest that they are yet to make decisive dent in creating their brand image in the market place.

While advertising introduces and propagates the company's name, its product and image through several mediums like advertisements in media, yellow pages, outdoor, sponsorships, etc., marketing involves specific strategies, incentives and offers for selling the company's products. Therefore, both advertising and marketing

Figure-3.2
Advertising Intensity (%) of Indian Pharmaceutical Firms, 1991–2005

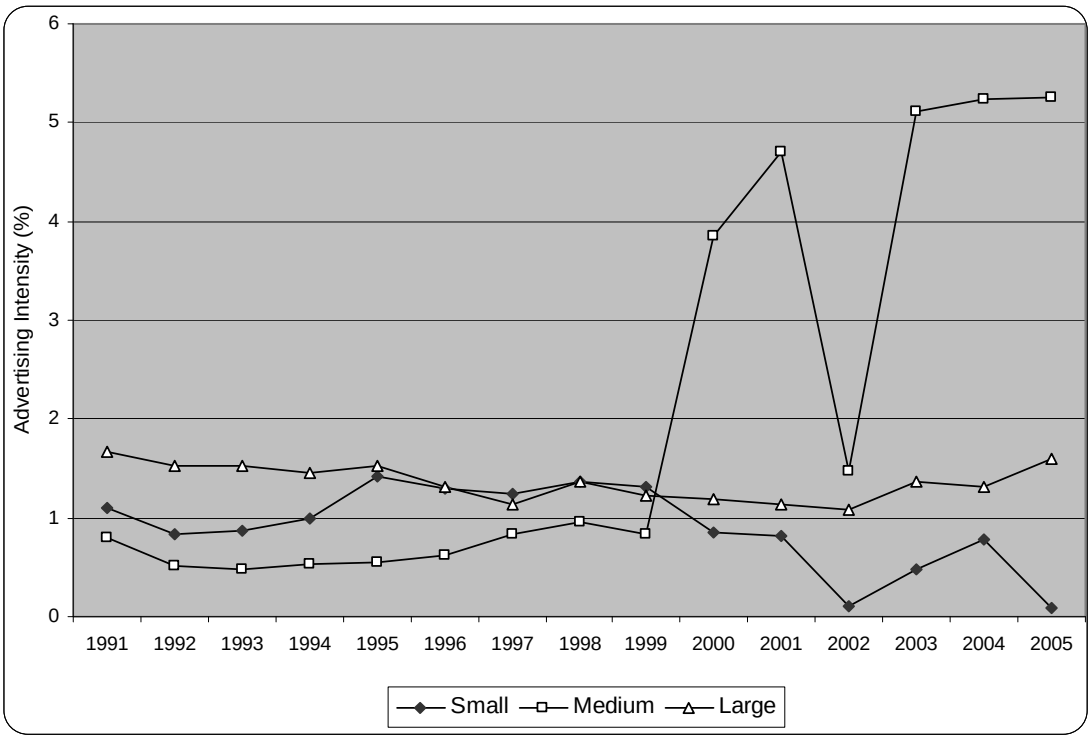
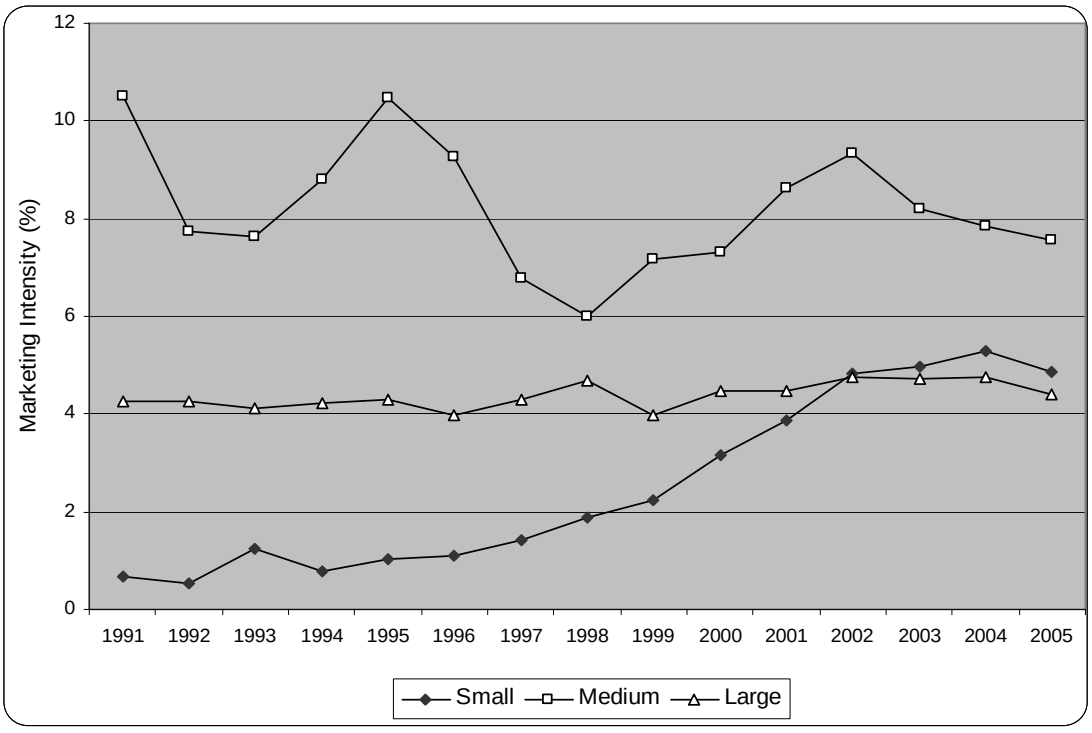


Figure-3.3
Marketing Intensity (%) of Indian Pharmaceutical Firms, 1991–2005



strategies are important for creating brand awareness about the company's products and commercially exploiting such brand names. The marketing intensity, measured as ratio of marketing expenses to sales, of small firms has been observed to have

increased continuously since 1994 and even exceeded that of large firms from 2002 onwards. It appears that Indian small pharmaceutical firms with cost- effective processes are adopting more aggressive marketing strategies to expand their customer base to meet the ever-increasing competitive pressures in the market place. The medium pharmaceutical firms, relatively more marketing intensive as compared to other firm sizes, are characterized by a fluctuating trend in their marketing intensity during 1991–2005. The large firms' marketing intensity is observed to be stable and is hovering around 4 per cent.

3.3.4 Market Power of SMEs

With the permission of 100 per cent FDI under the automatic route, free imports of bulk drugs and formulations and removal of licensing requirement, pharmaceutical SMEs are expected to face increased competition. The import of cheap drugs, entry of new foreign firms and expansion of large domestic firms are also likely to increase the number of available substitutes to the domestic consumers. In a monopolistic industry, such competitive pressures and increase in the number of substitutes act against the market power of SMEs and tend to reduce their price cost margin (PCM). PCM measures the extent by which a firm is able to raise the price of the product above the marginal cost of production. A higher PCM indicates a higher market power of a firm.

Contrary to the above argument, the price cost margins of pharmaceutical SMEs have increased during 1991–2005 and so also that of large pharmaceutical firms. However, the PCM of large firms has grown much faster than that of SMEs (Table-3.7 and Figure-3.4.). This rising PCM across firm sizes suggests that Indian pharmaceutical firms are increasingly capable of charging prices much higher than the marginal cost involved in the production. While advertising and marketing continue to be important sources of increasing market power of the Indian pharmaceutical firms, the most immediate factor seems to be continuous reduction in the list of products covered in the drug price control regulation. The number of drugs under price control has been reduced successively from 347 in Drug Prices

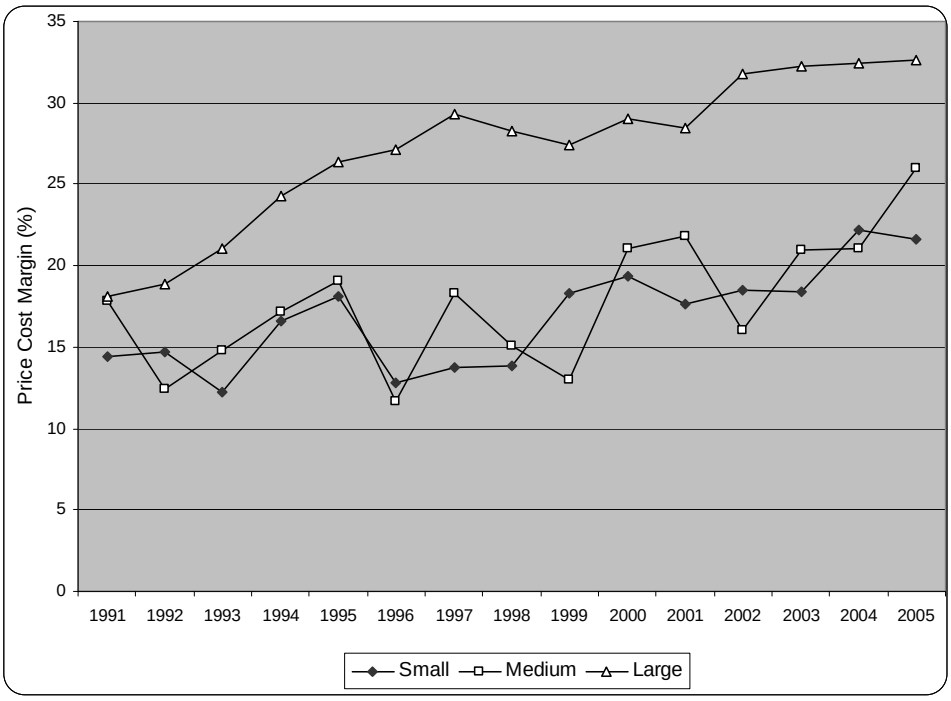
Control Order (DPCO) 1979 to 74 in DPCO 1995, which has given ample scope for pharmaceutical firms to raise prices.

Table-3.7
Price Cost Margin (%) by Firm Size

Year	Price Cost Margin (%)		
	Small	Medium	Large
1991	14.4 (9)	17.9 (5)	18.1 (46)
1992	14.7 (14)	12.4 (8)	18.9 (52)
1993	12.3 (22)	14.8 (13)	21 (59)
1994	16.6 (39)	17.2 (18)	24.3 (77)
1995	18.2 (63)	19 (24)	26.4 (87)
1996	12.8 (72)	11.6 (24)	27.2 (92)
1997	13.7 (62)	18.3 (24)	29.4 (93)
1998	13.9 (69)	15.1 (24)	28.3 (96)
1999	18.3 (77)	12.9 (23)	27.4 (105)
2000	19.4 (81)	21.1 (27)	29 (110)
2001	17.6 (83)	21.9 (31)	28.5 (117)
2002	18.5 (80)	16 (28)	31.8 (116)
2003	18.4 (86)	21 (31)	32.2 (119)
2004	22.2 (83)	21 (27)	32.4 (125)
2005	21.7 (62)	25.9 (22)	32.6 (107)
Total	17.88	19.13	29.70

Note: PCM is calculated as the value added minus labour cost divided by value added plus cost of raw materials; Number of firm is in parenthesis.
Source: Prowess Database (2007), CMIE.

Figure-3.4
Price Cost Margin (%) of Indian Pharmaceutical Firms, 1991–2005



3.3.5 Profitability Performance

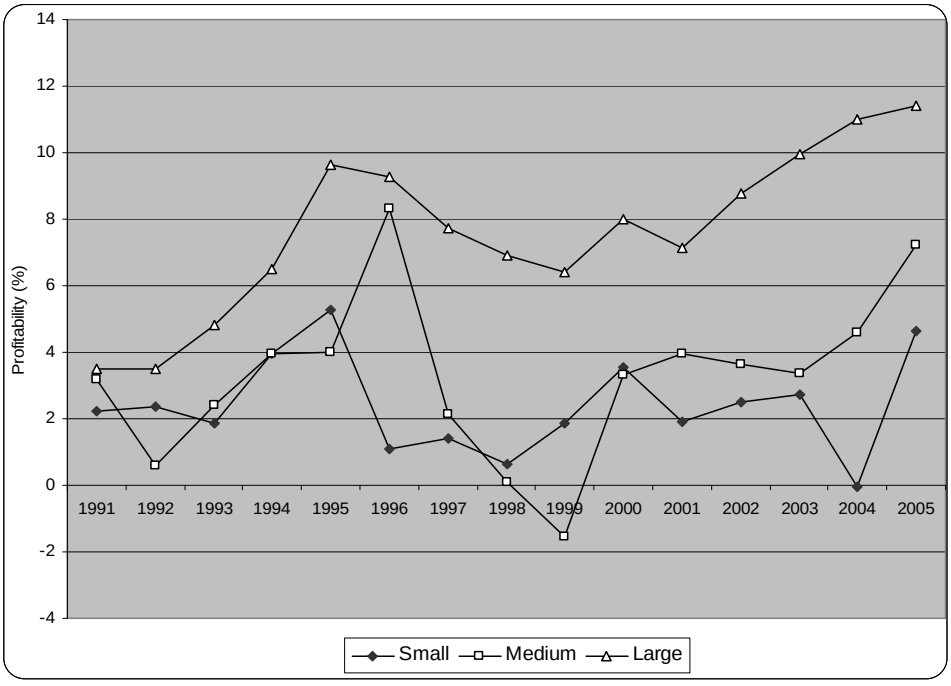
The consistently rising PCMs may not translate into higher profitability performance as the profit margin is a function of total revenue and total cost (i.e. fixed plus variable costs) unlike PCM which is a function of price (i.e. per-unit revenue) and marginal cost (i.e. per unit change in the variable cost) of production. The profitability performance of Indian pharmaceutical SMEs and large firms has been summarized in Table-3.8 and Figure-3.5. It can be seen that the SMEs and large firms had very close profit margins in 1991 but disparity widened since 1997. In 1991, small, medium and large firms had profit margin of 2 per cent, 3 per cent, and 3.5 per cent respectively. By 2005, their corresponding profit margins grown to 4.7 per cent, 7.2 per cent, and 11.4 per cent. For the overall period 1991-2005, they respectively had a profit margin 2.3 per cent, 3.6 per cent and 8.8 per cent. This suggests that large pharmaceutical firms have been able to improve their profitability quite substantially whereas such profitability improvements in the case of small and medium pharmaceutical firms were moderate.

Table-3.8
Profit after tax as a per cent of sales of Indian pharmaceutical companies, 1991–2005

Year	PAT as a per cent of sales		
	Small	Medium	Large
1991	2.21 (9)	3.16 (5)	3.50 (46)
1992	2.38 (14)	0.60 (8)	3.51 (52)
1993	1.89 (22)	2.43 (13)	4.83 (59)
1994	3.96 (39)	3.96 (18)	6.50 (77)
1995	5.29 (63)	3.98 (24)	9.63 (87)
1996	1.10 (72)	8.31 (24)	9.26 (92)
1997	1.40 (62)	2.14 (24)	7.72 (93)
1998	0.62 (69)	0.08 (24)	6.92 (96)
1999	1.88 (77)	-1.56 (23)	6.42 (105)
2000	3.56 (81)	3.32 (27)	8.00 (110)
2001	1.93 (83)	3.94 (31)	7.14 (117)
2002	2.52 (80)	3.66 (28)	8.79 (116)
2003	2.73 (86)	3.36 (31)	9.97 (119)
2004	-0.05 (83)	4.60 (27)	10.98 (125)
2005	4.65 (62)	7.21 (22)	11.40 (107)
Total	2.28	3.63	8.82

Note: Number of firm is in parenthesis.
Source: Prowess Database (2007), CMIE.

Figure-3.5
Trend in the profitability of Indian pharmaceutical firms, 1991–2005



3.4 Identification of SMEs for Interviews and Case Studies

From the First Source database we have identified the names of pharmaceutical SMEs and their addresses. After the identification, the study adopted both personal visit and e-mail/telephonic interviews with the manager of a group of ten SMEs to understand the link between government policy and export behaviour. Personal visit to three pharmaceutical SMEs located in the Okhla industrial area near Delhi was carried out to have a personal interaction with the exporting SMEs. The remaining seven SMEs were surveyed through e-mail/telephonic approach. All these SMEs are located in and around Delhi (i.e. National Capital Region). Although a larger regional focus covering SMEs in other locations would have been more useful but resources and time available for such an effort is limited. In the survey, the focus was mainly on export behaviour of pharmaceutical SMEs and thus only qualitative information were elicited on firm' awareness about government schemes on export and other supports; types of assistance exporting SMEs would like to avail from policy makers, and different constraints inhibiting their export activities.

It is worthwhile to provide some results from the First Source database. The results obtained from the sample database of First Source are in accordance with that of ASI and NSSO data sources as discussed in section 3.3.1. The First Source database estimates 783 number of small firms which account for 76 per cent of the total number of pharmaceutical firms but possess just 6.7 per cent of industry gross fixed asset (Table-3.9). They operate with just about Rs. 1 crore of fixed assets per firm. Medium firms consist of relatively a small group of firms linking the largest group of small firms at the bottom and the second larger group of large firms at the top. Medium firms account for about 7 per cent of total number of firms in the industry and mere 4.8 per cent of industry fixed asset. As compared to small firms, the per firm fixed asset of medium size firms is Rs. 7.4 crore, nearly seven times higher. In the First Source database there are 169 large firms accounting for 16.5 per cent of total number of industry firms, 88.8 per cent of industry fixed asset and exhibit a per firm fixed asset of Rs. 61 crore.

A comparative picture of three performance indicators such as income per firm, income fixed assets ratio, and profit margin across three sizes of pharmaceutical firms is also presented in Table-3.9. The same inference as observed in the case of per firm fixed asset has also been obtained in the case of per firm sales performance. Small firms have the lowest per firm income at just 7 crore as compared to 17 crore of medium firms and 124 crore of large firms. The efficiency of using fixed asset for generating income (ratio of income to fixed asset) suggests that small pharmaceutical firms possess higher fixed capital efficiency when compared to the medium and large pharmaceutical firms. In spite of higher capital efficiency, small firms enjoy a profit rate of 3.2 per cent which is much higher than that of medium firms but less than that of large firms. Therefore, in spite of small firms working on the basis of the lowest per firm income they are better than the medium-sized firms in terms of their realized margins.

Table-3.9
Characteristic of Indian Pharmaceutical Industry by Firm Size based on Sample Database, 1999–2000

Firm Size	No. of Firms	Gross Fixed Asset (Rs. Crore)	Gross Fixed Asset per firm (Rs. Crore)	Income per firm (Rs. Crore)	Income Fixed Asset Ratio	Profit Before Tax as a % of income	Income Wage Ratio
Small	783 (76.2)	774 (6.7)	0.99	7	3.2	3.2	15.4
Medium	75 (7.3)	551 (4.8)	7.35	17	2.1	0.7	11.6
Large	169 (16.5)	10300 (88.8)	60.95	124	2.0	5.4	13.3
All Firms	1027 (100)	11600 (100)	11.30	41	2.1	5.0	13.4

Source: Calculation based on First Source database, 2000 and 2004.

3.5 Conclusions

The preceding analysis reveals that small pharmaceutical firms including those from unorganized sectors are the largest category in terms of number of units and they account for nearly a quarter of pharmaceutical value added in India. However, majority of these small firms are not engaged in any kind of in-house technological activities and those minority are engaged in R&D spend an insignificant proportion

of their sales. Small pharmaceutical firms are also characterized by relatively lower performance on employing new capital goods from abroad and undertaking advertising and marketing activities as compared to large companies. In terms of profitability performance small firms are found to have been lagging behind. These trends indicate that small pharmaceutical firms continue to be weak on technological front in spite of the process of globalization and liberalization.

Chapter IV

EXPORTS AND OUTWARD FDI AS MODES OF SMEs' TRANSNATIONALIZATION

4.1 Transnationalization through Exports

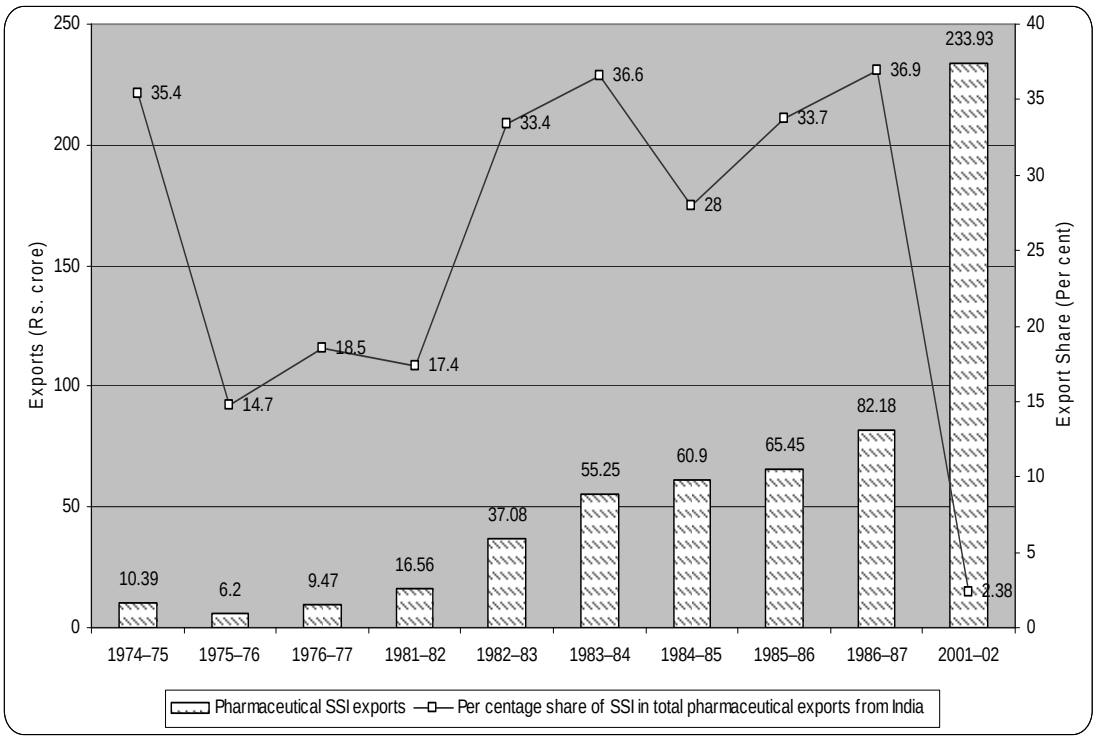
Over the years pharmaceutical SMEs have not only become major players in the domestic market but also have played a key role in the transnationalization process of the Indian pharmaceutical industry. Indian pharmaceutical small scale sector has consistently pushed up its export volume since 1975–76. They exported about Rs. 6 crore pharmaceutical products in 1975–76, which increased to Rs. 82 crore in 1986–87 and then to Rs. 234 crore in 2001–02. The contribution of SMEs to total pharmaceutical exports was 35 per cent in 1974–75, fallen to 15 per cent in 1975–76 and reverted back to reach 36.9 per cent in 1986–87. However, SME export share has fallen to its lowest ever value of just 2.4 per cent in 2001–02 (Table-4.1 and Figure-4.1).

Table-4.1
Exports by Indian Pharmaceutical Small Scale Units, 1974–75 to 2001–02

Year	Pharmaceutical Exports (Rs. Crore)			Exports as a % of Production
	SSI	Total	% share of SSI	SSI
1974–75	10.39	29.4	35.4	NA
1975–76	6.20	42.2	14.7	NA
1976–77	9.47	51.3	18.5	7.3
1981–82	16.56	95.4	17.4	NA
1982–83	37.08	111.1	33.4	NA
1983–84	55.25	150.9	36.6	NA
1984–85	60.90	217.5	28.0	NA
1985–86	65.45	194.4	33.7	NA
1986–87	82.18	223.0	36.9	NA
2001–02	233.93	9835	2.38	4.13

Source: Export data up to 1986–87 is from following sources: Development Commissioner (Small Scale Industries) [DCSSI] as quoted in Indian Institute of Foreign Trade (1978) *Role of State Small Industries and Export Corporations in the Export Effort of Small Scale Sector*, New Delhi; DCSSI (1985) Small Scale Industries In India: Hand Book of Statistics 1985, Government of India, New Delhi; DCSSI (1989) Small Scale Industries In India: Hand Book of Statistics 1989, Government of India, New Delhi. Export data for the year 2001–02 is from: the Third All India Census (Registered and unregistered SSI Units) 2001–02; Annual Report 2003–04 Department of Chemicals and Petrochemicals, Government of India. Production data for 1981–82 and 2001–02 are respectively from Department of Chemicals & Fertilizers (1981) Indian Drugs Statistics 1980–81, Government of India, New Delhi and Third All India Census (Registered SSI Units) 2001–02.

Figure- 4.1
Exports by Pharmaceutical Small Scale Sector in India, 1974–75 to 2001–02



During 1990s SMEs export expansion has significantly lagged behind as compared to their large counterparts. The lower shares of SMEs in total exports reflect that SMEs failed to realize their export potential unlike large firms and continued to rely on domestic market for growth. The export intensity, measured as the proportion of export to total production, of small scale sector has fallen from 7.3 per cent in 1976–77 to 4.13 per cent in 2001–02. This is a dismal indication for the SME sector because transnationalization of market is crucial to meet the global competition.

In the context of unsatisfactory export contribution from the SME sector, it is worthwhile to examine the distribution of SMEs by the status of export activities. Four different categories of export status for SMEs can be distinguished: *(i)* non-exporting SMEs: firms who had never exported during the available years over 1991–2005; *(ii)* irregular SME exporters: these firms had undertaken irregular export activities. For example, A B L Biotechnologies Limited had exported in 1994 and 1995 but did not export during 1996–1998. Again in 1999 the company did some exporting but none during 2000–2005; *(iii)* recently regular SME exporters: these firms did not export initially but started consistent exporting after some years. Bajaj Consumer

Care Limited provides a good example of a recently regular SME exporter, which did not export over 1996–1999 but started exporting regularly during 2000–2005; and *(iv)* regular SME exporters: these firms have exported throughout the available years of the study period. For example, B D H Industries Limited has been consistently exporting since 1994 to 2005. Table-4.2 presents the distribution of pharmaceutical SMEs by these export status during 1991–2005 for a sample of 146 pharmaceutical SMEs extracted from Prowess database.

Clearly, the low export performance of Indian Pharmaceutical SMEs is because a large proportion of them either completely focused on domestic market or just carries out irregular export order received from aboard. Non-exporting SMEs constituted about 35 per cent of total SMEs and another 29 per cent are irregular exporters. About 22 per cent of the SMEs are regular exporters and another 14 per cent have recently transformed into regular exporter status. Between small and medium firms, small firms seem to be less inclined for exporting with 40 per cent of them are not exporting and another 36 per cent are irregular exporters.

Table-4.2 Distribution of Indian Pharmaceutical SMEs by Export Status

Export Status	**Number of Firms**		
	Small Firm	**Medium Firm**	**SMEs**
Non-exporters	43 (40)	8 (21)	51 (35)
Irregular exporters	38 (36)	5 (13)	43 (29)
Recently regular exporters	13 (12)	7 (18)	20 (14)
Regular exporters	13 (12)	19 (49)	32 (22)
All	107 (100)	39 (100)	146 (100)

Note: In parenthesis is the percentage share to total.
Source: Estimation based on Prowess Database (2007), CMIE.

Table-4.3 and Figure-4.2 present the export intensities of the sample Indian pharmaceutical firms by firm size since 1991. It can be seen that though export intensity of small firms has consistently increased since 2000, it has remained below the 10 per cent mark. Medium firms have performed slightly better than small firms in terms of export intensity. Among all the firm sizes, the large firms have witnessed

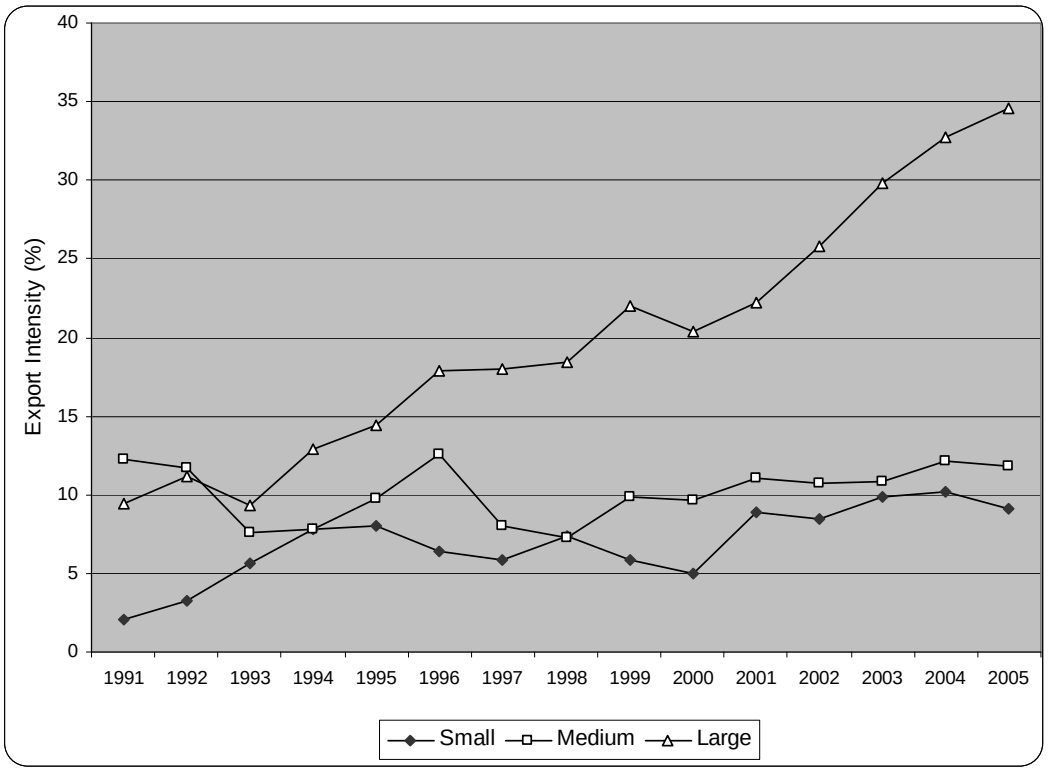
a dramatic growth in their export intensity. Their export intensity jumped three and half times between 1990–91 and 2004–05. In the year 2004–05, the export intensities of small and medium firms are 4 and 3 times lower than the export intensity of large firms respectively. The low levels of export intensity of the sample Indian pharmaceutical SMEs confirmed that their pace of transnationalization through export activities is very slow as compared to their large counterparts.

Table- 4.3
Export Intensity of Indian Pharmaceutical Firms, 1991–2005

Year	Export Intensity (%)		
	Small	**Medium**	**Large**
1991	2.02 (9)	12.25 (5)	9.40 (46)
1992	3.20 (14)	11.72 (8)	11.18 (52)
1993	5.65 (22)	7.54 (13)	9.28 (59)
1994	7.77 (39)	7.84 (18)	12.88 (77)
1995	7.98 (63)	9.73 (24)	14.39 (87)
1996	6.38 (72)	12.58 (24)	17.92 (92)
1997	5.87 (62)	8.06 (24)	17.97 (93)
1998	7.40 (69)	7.31 (24)	18.38 (96)
1999	5.82 (77)	9.82 (23)	22.01 (105)
2000	4.96 (81)	9.60 (27)	20.39 (110)
2001	8.86 (83)	11.05 (31)	22.24 (117)
2002	8.45 (80)	10.69 (28)	25.84 (116)
2003	9.82 (86)	10.84 (31)	29.77 (119)
2004	10.15 (83)	12.12 (27)	32.77 (125)
2005	9.15 (62)	11.84 (22)	34.59 (107)
Total	7.71	10.50	24.87

Note: Number of firms in parenthesis.

Figure-4.2
Export Intensity of Indian Pharmaceutical Firms, 1991–2005



4.2 Determinants of SMEs' Export Behaviour: An Analytical Framework

As we discuss earlier in section 2.2., firm-specific capabilities are necessary conditions for transnationalization process of firms whether undertaking exports or outward FDI. There exists a rich literature based on firm-level data that has explored the role of technology, skill, managerial, organizational and other firm-specific variables affecting SMEs export performance. Drawing upon this literature, the study has identified following possible factors that may influence export behaviour of Indian pharmaceutical SMEs.

4.2.1 Technology

Technology is the most important intangible asset of a firm that determines its transnationalization activities including exporting. Technology encompasses a wide spectrum of firm-specific knowledge in modifying and developing new products,

processes, new design, novel organizational and managerial strategies, etc. The product life cycle model and technology gap theories of the international trade have examined and emphasized the critical role played by innovation in the emergence of trade between nations. Following these theoretical models a growing literature has explored the link between innovation and export performance at macro levels involving cross-country and cross-industry level. These studies used different measures of technological performance like patent and R&D and came to the conclusion that innovation activities and specialization tends to determine a country's export performance and specialization (Greenhalgh, 1990; Amable and Verspagen, 1995; Wakelin, 1997, 1998; Verspagen and Wakelin, 1997; Amendola, Guerrieri and Padoan, 1998, among others).

The empirical literature on the relationship between technological capabilities and export behaviour of SMEs establish a positive relationship. Yang, Chen and Chuang (2004) examined the role of technology on the export activities of Taiwanese SMEs and found that technology indicators such as R&D, technology import, and training investment positively affect their export behaviour. Fernandez and Nieto (2005) for a large sample of Spanish SMEs covering some 10579 observations during 1991–1999 found that the ratio of R&D expense over total sales came out with a significantly positive impact on export probability as well on export intensity. Anh *et. al.*, (2007) based on Vietnam Small and Medium Enterprise Survey 2005 found that SMEs' likelihood of exporting is significantly and positively related to their innovative activities measured by new products, production process and improvement of existing products. In the case of Italian SMEs, Basile *et. al.*, (2004) observed that the degree of internationalization of these firms is positively dependent upon their R&D strategies measured by product and process innovation. Singh (2006), based on simultaneous equation estimation for a sample of 35 large- and medium-sized private pharmaceutical companies in India during 1988–89 to 1991–92, has observed that their export intensities is positively and significantly dependent upon their R&D intensities. Singh's result has been further confirmed by Aggarwal (2007) for large- and medium-sized pharmaceutical companies for most recent years since 1990s.

Consistent with the findings from above literature on SMEs, the study has predicted a positive relationship between the technological capability of Indian pharmaceutical SMEs and their export performance. Two mechanisms of technological knowledge acquisition by Indian pharmaceutical SMEs have been distinguished. First, in-house R&D efforts directed towards creating new technologies and/or assimilating and improving existing technologies. This is measured by firms' in-house capital and current R&D expenses as a per cent of sales. Second, acquiring and absorbing technologies from external sources including purchase of foreign technologies through licensing and importing new process technologies embodied in new capital goods. These external sources clearly supplement SMEs' internal technological activities and can play a crucial role in improving their overall innovative capability. Technological payments made abroad and expenses incurred on importing capital goods by SMEs are deflated by sales to measure these two modes of foreign technology acquisition.

4.2.2 Firm Age

The age of the firm can be another probable factor to affect the export behaviour of Indian pharmaceutical SMEs. It proxies firms accumulated business experience and establishes maturity and contacts in the market place. In Indian pharmaceutical industry old and established firms primarily served an existing larger local market in the past. However, to meet intensifying global competition since 1990s, these old SMEs as well as the new ones, are required to enhance their market focus relatively more on exports. With prior business experience, accumulated contacts and information, it can be expected that relatively older SMEs may be able to break into international market at more ease than newly established SMEs. On the contrary, it can also be possible that these old firms with secured presence in the domestic market may be slow to adopt export strategy unlike new SMEs that don't have sufficient space in the domestic market and urgently seek export as alternative route to achieve full utilization of set up plants. Further, newly started pharmaceutical SMEs represent new process technologies in the form of latest machinery and

equipments, new manufacturing practices, etc., which can provide them relative advantage in the export market as compared to old firms. Therefore, the impact of firm age on SMEs' exporting activities is not clear.

4.2.3 Firm Size

In the export literature, firm size has been found to be a crucial explanatory variable for firms' export performance (Kumar and Pradhan, 2007; Kumar and Siddharthan, 1994; Calof, 1994; Bonaccorsi, 1992). This research also suggested that relationship between firm size and exporting may involve a non-linear relationship if the sample includes firms with diverse size classification from small- to large-sized ones. Firm size represents large resource base with preferential access to capital, skill, raw materials etc., and hence large sized firms possess suitable advantages to transnationalize their business. The resource-based theory of the firm (Penrose, 1959; Barney, 1991; Connor, 1991) and monopolistic advantage theory of transnationalization (Hymer, 1960; Kindleberger, 1969; Caves, 1971) indicate that firms' involvement in international markets is critically linked to their accumulated resources and monopolistic advantages and since small firms relatively have lower amounts of these resources as compared to large firms, firm size does explain inter-firm differences in internationalization process. Previous studies on Indian pharmaceutical industry (Singh, 2006; Aggarwal, 2007) have found that export performance of pharmaceutical firms to be positively dependent upon their size. In the present study firm size as indicated by sales has been included as a positive predictor of Indian pharmaceutical SMEs' export performance.

4.2.4 Product Differentiation

The global pharmaceutical industry is known to be both technology and product differentiation intensive in character (Matraves, 1999). Therefore, to enter into the pharmaceutical export market, Indian SMEs needs to have a broad-based advertising, marketing, and distribution strategies. Clearly, these activities involve considerable funds and usually resource-starved SMEs pay limited attention to them

as compared to large sized firms. This study distinguished two main types of product differentiation activities of pharmaceutical SMEs: advertising activities to create consumer awareness about the product and company and marketing activities that involve in the specificities of incentives and strategies in actual sales activities. The advertising and marketing expenses incurred by SMEs expressed as per cent of their sales have been used in the study and both are predicted to have positive impact on their export behaviour.

4.2.5 Foreign Ownership

Indian pharmaceutical SMEs having a foreign company as a shareholder as compared to solely domestic-owned SMEs can be predicted to show different behaviour with respect to exporting. The Indian policy regime, since August 1991, has permitted large firms (including foreign companies) to participate in equity capital of small units up to a limit of 24 per cent of the shareholding. It can be argued that SMEs having foreign equity participation are likely to have access to the foreign firm's finance, technologies, skills, marketing expertise, global distribution channels, information, etc., and these resources may reduce the size-led constraints on their expansion into international markets. A number of studies investigated the relationship between foreign ownership and export performance of Indian firms for recent periods since 1990s (Kumar and Pradhan, 2007; Aggarwal, 2002; Siddharthan and Nollen, 2004) and suggested a positive relationship. However, studies on Indian pharmaceutical industry such as Singh (2006) and Aggarwal (2007) indicated a very minimal or strongly negative impact of foreign ownership on export performance of Indian pharmaceutical firms. Singh (2006) argued that foreign ownership may act against the export orientation of foreign affiliates if the parent firm is primarily motivated to exploit the large domestic market and imposed export restrictions so as to avoid negative impact on exporting of mandated subsidiaries located elsewhere (i.e. intra-MNE sales inter-dependence). Therefore, in the present study the impact of foreign ownership on export performance of Indian pharmaceutical SMEs is predicted to be ambiguous.

4.2.6 Fiscal Incentives

For a long time, Indian government has provided various fiscal and other benefits to promote the industrial sector in general and SMEs in particular. The fiscal benefits cover a wide range of incentives targeted at export activities, R&D, skill improvement, etc. In the case of exporting, fiscal incentives include concessional import duty on capital goods imported under the Export Promotion Capital Goods (EPCG) Scheme, reimbursing customs and central excise duties suffered on the inputs used in the manufacture of exports under the Duty Drawback Scheme, import of inputs required for export production free of customs duty under the Duty Exemption Scheme, etc., besides the fiscal benefits that these firms may enjoy being located in the Special Economic Zones (SEZ) and being an export-oriented units (EOU). For SME exporters, these fiscal incentives by government may play a crucial role in releasing resources for these firms to improve their capabilities to meet the global quality standards and reduces their effective costs of internationalization.

4.2.7 Market Power

The export behaviour of pharmaceutical SMEs can also be predicted to be related to the extent of their market power in the home economy. The variable market power can affect the export performance of pharmaceutical SMEs in both negative and positive ways. A resource constraint SME that enjoys a higher level of market power in the domestic economy is less likely to undertake risky export activities, especially when the domestic market is growing at a higher rate. The higher level of market power also represents the possession of a set of monopolistic advantages by the concerned SMEs, which may inspire these SMEs to transnationalize to exploit such advantages in global markets. In this study the market power of an SME has been measured by its capability to charge a price higher than the actual marginal cost of production, the price cost margin.

4.2.8 Liberalization

The liberalization of policy regime and opening up of the pharmaceutical industry to global competition since 1991 may also lead to changes in the export behaviour of Indian pharmaceutical SMEs. Many of these reform measures such as dismantling of licensing regime, reduction in import tariffs on drugs, removal of restriction on the growth of large firms, etc., are clearly not quantitatively measurable but can positively or negatively affect SMEs' export intensity. A dummy variable taking a zero value for year greater than 1994 and taking unity for years since 1994 has been used to examine the responsiveness of SMEs' export performance to the implementation of economic reforms in India.

4.2.9 The Censored Regression Specification

Taking into account the above mentioned independent variables, the empirical framework of the present analysis can be expressed as follows:

$$\begin{aligned} EXPINT_{it} &= x_{it}\beta + \varepsilon_{it} \\ &= \beta_0 + \beta_1 AGE_{it} + \beta_2 SIZE_{it} + \beta_3 RDINT_{it} + \beta_4 FTIM_{it} + \beta_5 KIMP_{it} + \beta_6 ADVINT_{it} \\ &\quad + \beta_7 MKTINT_{it} + \beta_8 FDUM + \beta_9 FBINT_{it} + \beta_{10} LIBDUM + \beta_{11} MPWR_{it} + \varepsilon_{it} \end{aligned} \quad \text{...(A)}$$

Where x_{it} is a vector of the explanatory variables, β is a vector of regression coefficients, and ε_{it} is the random error term. Detailed measurements of the dependent and independent variables are as follows:

$EXPINT_{it}$: Exports of i^{th} SME as a percentage of sales in the year t.
AGE_{it}: The age of i^{th} SME in number of years.
$SIZE_{it}$: Total sales of i^{t}h SME in tth year.
$RDINT_{it}$: Total R&D expenditure as a percentage of total sales of i^{th} SME in t^{th} year.
$FTIM_{it}$: Royalties, technical and other professional fees remitted abroad by i^{th} SME as a percentage of sales in t^{th} year.
$KIMP_{it}$: Capital goods imports by the i^{th} SME as percentage of sales in t^{th} year.
$ADVINT_{it}$: Advertising expenses incurred by i^{th} SME as a percentage of sales in t^{th} year.
$MKTINT_{it}$: Marketing expenses incurred by i^{th} SME as a percentage of sales in t^{th} year.

FDUM: Foreign ownership dummy taking 1 if at least 10 per cent equity stake of an SME is with foreign promoters and 0 otherwise.

$FBINT_{it}$: Fiscal benefits received by i^{th} SME as a percentage of sales in t^{th} year.

LIBDUM: Liberalization dummy taking 1 for reform period 1994 to 2005 and 0 for the pre-reform period 1991 to 1993.

$MPWR_{it}$: Market power is calculated as the value added minus labour cost divided by value added plus cost of raw materials.

In the regression equation A, the dependent variable, export intensity (EXPINT), possess a special characteristic—its multiple observations are clustered at zero representing firms that are not engaged in exporting but takes continuous values for exporting firms. Symbolically, such a nature of the dependent variable can be expressed as follows:

$$EXPINT_{it} = \begin{cases} x_{it}\beta + \varepsilon_{it} & \text{if } x_{it}\beta + \varepsilon_{it} > 0 \\ 0 & \text{otherwise} \end{cases} \quad \text{...(B)}$$

As a result of the censuring nature of the dependent variable, the application of ordinary least squares estimation to the above econometric relationship will result in biased coefficient estimates. Tobin (1958) has suggested the use of likelihood estimation for such models involving non-negatively censored dependent variable and when error term satisfies the classical assumptions, estimates obtained will be unbiased and consistent. However, in actual empirical analysis, the error term may violate these assumptions including normal distribution and homoscedasticity and in these cases the maximum likelihood estimation will not provide consistent estimates (Chay and Powell, 2001). A number of semi-parametric estimators such as Symmetrically Censured Least Squares (SCLS), Censored Least Absolute Deviations (CLAD), Identically Censored Least Squares (ICLS) and Identically Censored Least Absolute Deviations (ICLAD) have been suggested in the literature to address the censored models involving non-normal and/or heteroscedastic error distribution. In the present study some of these semiparametric approaches also have been adopted along with traditional maximum likelihood Tobit estimation.

It should be noted that in the case of panel nature of our dataset, estimating a panel fixed effect estimator is appropriate but presently such parametric estimator for censored data does not exist. Random effect estimation for the censored model exists but it uses some nonlinear optimization method like a quadrature approximation used by STATA for fitting the original likelihood function[2]. The quadrature approach for estimating random effects censored regression is generally not appropriate for large panel size and the result obtained thereof is likely to be quite sensitive to the number of quadrature points used in the estimation[3].

4.2.10 Estimation Methods, Results and Inferences

The censored regression A has been estimated with a sample of 144 pharmaceutical SMEs (See Annexure 1) extracted from the Prowess database of the Centre for Monitoring Indian Economy (CMIE). Of the total 1127observations, there are 518 observation related to exporting and 609 related to non-exporting SMEs. All the empirical estimation undertaken in this study has been conducted with the help of the statistical package, STATA, version 8.1. Results obtained from all the three estimators—maximum likelihood Tobit, SCLS and CLAD have been summarized in Table-4.4 The reported statistics for testing the significance of individual partial coefficients in Tobit, SCLS and CLAD models are based on bootstrapped standard errors with 1000 replications for early methods and 100 replications for the last method. These standard errors have been observed to be more useful for statistical inferences than the traditional standard errors when bootstrapping is applied to the coefficients of the originally estimated model.

In the case of maximum likelihood estimation of pooled Tobit, the conditional moment test implemented in STATA for checking normality of disturbances in a Tobit model return a conditional moment (CM) value of 131.25. This statistic is significant at 1 per cent level and is much higher than the 1 per cent bootstrap critical

[2] See Stata Reference Manual Release 7, Volume Su-Z, Stata Press, pp. 474–478.

[3] In fact quadchk test conducted in Stata suggested that random effect Tobit estimation for our dataset is not appropriate.

value of 20.8[4]. This suggests that errors in the estimated pooled Tobit model are not normally distributed. As a result of this, the study has estimated two semiparametric censored regression estimators, namely, Symmetrically Censored Least Squares (SCLS) and Censored Least Absolute Deviations (CLAD) to take care of the inconsistency problem that traditional maximum likelihood estimator for Tobit model suffers due to non-normal errors.

Table- 4.4
Determinants of Export Performance by Indian Pharmaceutical SMEs

Independent Variable	Pooled Tobit	SCLS	CLAD
	Coefficient (Bootstrapped Z)	Coefficient (Bootstrapped t)	Coefficient (Bootstrapped t)
RDINT	0.72355515 (1.12)	0.40694306*** (6.40)	0.08137931*** (2.60)
FTIM	-16.15376854 (0.19)	-0.29627659 (0.16)	3.84469149 (1.47)
KIMP	10.65184116*** (3.87)	-13.96527254*** (4.95)	6.69396049*** (34.05)
AGE	0.10792536 (0.89)	-0.24439650*** (7.04)	-0.01092558 (1.34)
SIZE	0.15983030*** (2.67)	0.04598031*** (4.60)	0.00930184** (2.41)
ADVINT	-0.46380305 (0.82)	-0.10642760 (1.18)	0.04005387 (1.38)
MKTINT	-0.11053438 (0.39)	0.10572195** (2.19)	0.01234341 (0.61)
FDUM	-14.03804016* (1.92)	0.06523322 (0.05)	-1.09358394* (1.89)
FBINT	8.43777657*** (8.99)	6.25944044*** (35.11)	7.43835377*** (110.60)
LIBDUM	-2.49938655 (0.65)	0.28667504 (0.21)	-0.87890103* (1.70)
MPWR	0.00784294 (1.44)	0.00443389*** (3.45)	0.00069202 (0.66)
Constant	-12.14021778** (2.41)	2.15622936 (1.57)	0.73182383 (1.44)
Log likelihood	-2761.8229		
LR chi2(11)	277.64		
Prob > chi2	0.0000		
Pseudo R^2#	0.4374		0.4611
R-squared		0.69	
Observations	1127	589	494

Note: Absolute value of bootstrapped z/t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%; #- correlation between predicted and actual value of the dependent variable.

Powell (1986) suggested that censored dependent variable model can be estimated by iteratively trimming the dependent variable around the regression function with a

[4] Conditional moment test against the null of normal errors—CM=131.25 with Prob > chi2 = 0.00000. Drukker's (2002) bootstrap values for this statistic are: 10% = 7.36855, 5%=11.074614 and 1%= 20.837669 critical values.

view to arrive at the final recensored dependent variable that is symmetrically distributed around the estimated regression function (see, Chay and Powell, 2001 for a non-technical description of these methods). The estimators, thus, obtained will be consistent and asymptotically normal for a wide group of symmetric errors suffering from heteroscedasticity of unknown form. The CLAD estimation, proposed by Powell (1984) and modified by Buchinsky (1994), is another alternative to maximum likelihood estimation methods to provide estimators that are robust to heteroscedasticity and non-normality. As compared to SCLS, CLAD method is less restrictive because it is based on zero median restriction unlike symmetry assumption (i.e. it even permits asymmetric errors) (Chay and Powell, 2001). From above discussion it is clear that inferences drawn based on SCLS is better than those based on maximum likelihood estimation and that the inferences derived from CLAD estimation are superior to that of SCLS.

Among technological variables, R&D has consistently a positive impact across all the three estimations and achieves 1 per cent level of statistical significance in both SCLS and CLAD regressions. Given the superiority of both these estimations over traditional Tobit, this implies that Indian pharmaceutical SMEs conducting in-house R&D activities display a stronger export probability and intensity than those without such capabilities. The result tends to verify the argument that in knowledge-based industries likes pharmaceuticals, indigenous technological efforts constitute *a priori* and essential condition for transnationalization of firms irrespective of sizes. The experience of medium-sized firms like Tonira and Fermenta Biotech and small- sized firms such as N G L Fine-Chem and Bal Pharma verify that firm-specific emphasis on strict quality enforcement, implementing best manufacturing practices, and incurring R&D to develop cost-effective process, formulations, etc., helps to expands competitive position in world markets (Annexure 2). The current level of R&D intensity of Indian pharmaceutical SMEs consistently falls below 1 per cent but even this low level of R&D is causing significant export gains, thus this result suggests that there is a large scope for increasing exports by pharmaceutical SMEs by encouraging their R&D activities.

Among other two technological indicators, acquisition of foreign disembodied technologies measured by technological payment abroad failed to achieve any accepted level of statistical significance. This indicates that foreign technology purchase may not improve SMEs' export performance. Pradhan (2007b) argued that import of foreign technology comes with several restrictions besides directly restricting the sale of manufactures based on imported technology to the importers' home market. With such restrictions foreign technology licensing may not be directly helpful for export activities unless importing firms are able to generate unique advantages by substantially improving upon the imported technologies. On the contrary, turn out to be significant in all the three estimations. While its impact is negative in the case of SCLS estimation, it is positive in both pooled Tobit and CLAD estimation. Since CLAD estimation is based on less restrictive assumption than SCLS, one can interpret the impact of imported capital goods as positive for SMEs' export performance. This tends to support the argument that modernization of plant and machinery through latest capital goods embodied new processes which are quite helpful for exporting activities of pharmaceutical SMEs.

The finding on the independent variable firm age is quite mixed across estimations. It is positive in the case of Tobit but possesses negative impact in both SCLS and CLAD estimations. Only in the case of SCLS, this variable reaches 1 per cent of statistical significance. These results indicate that firm age is not a significant explanatory variable and at best its impact on SME's export performance is minimal or negative. Firm size has been consistently positive and significant across estimations suggesting that even among SMEs size plays a crucial role in their export performance. Given the small size of pharmaceutical SMEs, this result confirms that size is in fact a strong barrier to these firms' transnationalization. Size related constraints can be seen in managerial capability, access to finance, information, low firm-specific competitive assets, inadequate scale of operation, etc. From this it would appear that government export policies must recognize explicitly firm size heterogeneity and consider the support measures that are specific to SMEs export requirement.

Among the two product differentiation variables the impact of advertising is statistically not different from zero across all the three estimations. Marketing activities similarly fails to achieve any accepted level of significance in both Tobit and CLAD estimations whereas turn out to be positive and significant at 5 per cent level in SCLS estimation. This not-so-significant impact of product differentiation variables on SME's export performance may be due to the fact that these activities are largely directed at the domestic market. Indian pharmaceutical SMEs in order to meet the increased competitive pressures and to maintain their existing domestic market shares have been undertaking product differentiation activities and such domestic market oriented activities may not necessarily translate into export gains.

The foreign ownership dummy, FDUM, came out with a negative sign in both Tobit and CLAD estimation and possesses a 10 per cent statistical significance. This result is similar to what obtained by Aggarwal (2007) for a sample of Indian pharmaceutical firms. This result indicates that foreign ownership tends to restrict SMEs' export participation and performance. One of the reasons that could explain this behaviour is that foreign affiliates operating in Indian pharmaceutical industry are continued to be primarily domestic marketing seekers and hence perform less on export front[5].

The fiscal incentive granted to SMEs, FBINT, came out with a predicted positive sign and is significant at 1 per cent level. Above result is robust across three estimations and suggests that fiscal incentives granted by government have favourably encouraged SMEs' international involvement. Pharmaceutical SMEs appear to have effectively used the additional resources and advantages arising from various fiscal incentives for R&D activities, upgradation of quality, direct exporting, etc., for export purposes.

[5] In the pre-1970s period, foreign firms dominating the pharmaceutical industry used to simply imports bulk drugs and process them into formulations for selling in India, leading to large trade deficits and high drug prices.

The liberalization dummy, LIBDUM, in the CLAD estimation exhibits a negative and significant impact on the export behaviour of Indian pharmaceutical SMEs. This suggests that the export performance achieved by these firms in 1994-2005 falls below their performance in 1991-1993, once the impacts of other independent variables are controlled. This result is quite contrary to the general expectation that liberalization of policy regime would push pharmaceutical SMEs into export activities. The declining share of SMEs in total pharmaceutical exports between 1986-87 and 2001-02 observed earlier is clearly due to fallen export intensity of SMEs. This declining export performance of pharmaceutical SMEs in the liberalized policy phase calls for serious policy rethinking to address factors that are inhibiting SMEs international expansion.

The market power variable, MPWR, has a positive sign in all the three estimations but is significant only in the case of SCLS. Therefore, the result is quite mixed and given the superiority of CLAD estimation, one may conclude that the role of this variable is not so critical for SMEs export performance.

4.3 Transnationalization through Outward Foreign Direct Investment (OFDI)

Outward FDI (OFDI) is a crucial enterprise-level strategy for improving competitiveness in the international market. Although the recent wave of Indian OFDI from manufacturing sector has been predominantly led by large Indian firms, SMEs have also been actively participating in that process of transnationalization. According to the UNCTAD (2005) SMEs accounted for about 26 per cent of OFDI approvals given to the Indian manufacturing firms and about 7 per cent of approved value of outward equity as at 31st March 2001. In the case of pharmaceutical sector, SMEs claimed about 9 per cent of OFDI approvals and 4 per cent of approved OFDI equity value. In the UNCTAD study, SMEs were defined based on critical values obtained from industry-wise sales distribution. A number of case studies reported in the study indicated that OFDI has contributed to the increasing competitiveness of Indian SMEs by expanding markets and enhancing overseas trade-supporting

networks. It has also benefited these SMEs by ensuring access to foreign technologies, skills and research infrastructure based in developed countries. Pradhan (2007b) for a sample of manufacturing firms found that overseas investment by Indian multinationals have been significantly export promoting. He argued that trade-supporting type of Indian OFDI has led to increased export from India by providing better after sales services, customer supports, and effective marketing strategy.

This section explores the possibility of OFDI by Indian pharmaceutical SMEs and analyzes the ways in which transnationalization affect the performance of small and medium firms. Unlike the past, since early 1990s Indian policy makers have taken a strategic view of OFDI for transnationalization of Indian enterprises. Various restrictions imposed on outward investment of Indian firms in the pre-1990s period have been progressively lifted. Allowing large cash remittances under automatic approval route and explicitly encouraging Indian firms to become multinationals through overseas acquisition have been main thrusts of present Indian OFDI policy regime (Pradhan, 2007d). The amount of OFDI permitted under automatic route has been raised from 200 per cent of the net worth of the investing company in 2005 to 300 per cent on June 14, 2007[6]. However, the existing policy regime is providing overriding importance to the transnationalization of big Indian corporate sector and to the big overseas acquisitions by them but it failed to appreciate the role of OFDI in promoting competitiveness of SMEs. The policy that simply liberalizes the procedures for undertaking overseas investment and enhance the permissible limits on amount of OFDI can certainly help these large Indian corporate houses that possess strong monopolistic advantages, have previous international experience, information on overseas opportunities, necessarily financial capabilities, etc. to pursue OFDI aggressively. As compared to these large firms, SMEs' OFDI tends to get limited as they lack access to information, finance, capability to handle trans-

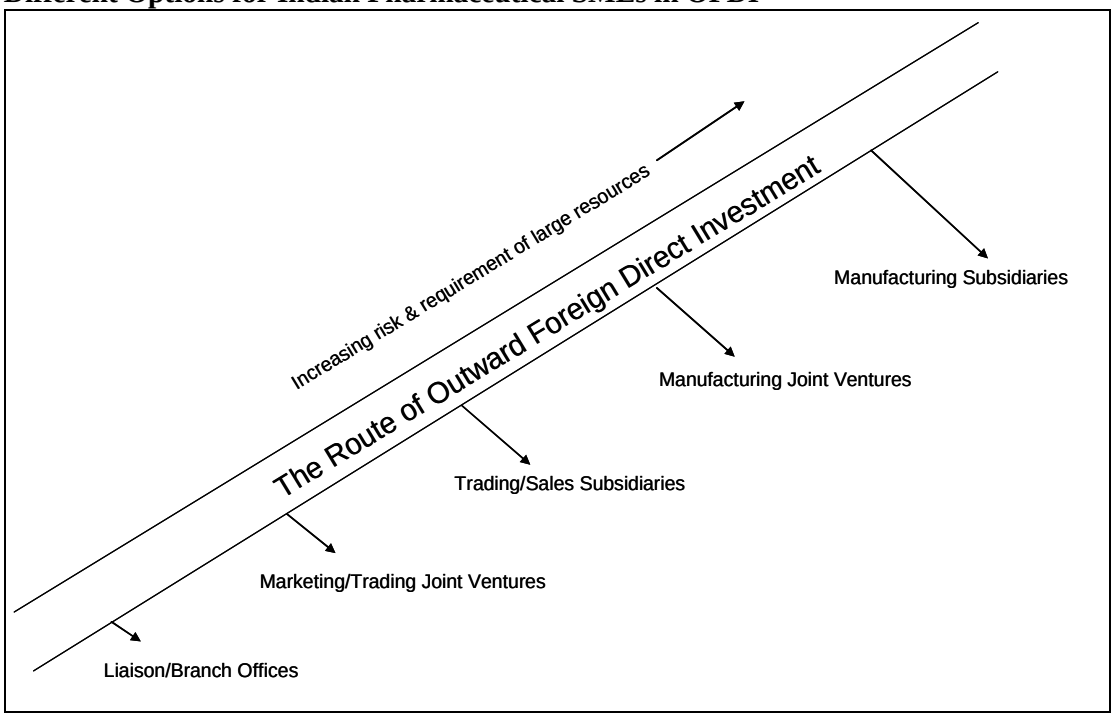
[6] RBI/2006-2007/437, A. P. (DIR Series) Circular No. 75, 'Overseas Direct Investment-Liberalisation', Dated: June 14, 2007.

border business, etc. Until OFDI policy regime put in place a supporting programme for promoting OFDI by SMEs, their maximum potential in OFDI cannot be realized.

4.3.1 The Potential of OFDI by Pharmaceutical SMEs

To examine the potential of OFDI by Indian pharmaceutical SMEs, it is important to distinguish between various types of OFDI that an SME can undertake. Given the associated risk and requirement of resources, various possible forms of overseas investment can be represented by an upward progressing line indicating rising risk and requirement of resources for implementing OFDI (Figure- 4.3).

Figure- 4.3
Different Options for Indian Pharmaceutical SMEs in OFDI



A pharmaceutical SME can perform OFDI by establishing liaison and branch offices abroad as local contact points for existing overseas customers of its exported products and by rendering technical support to them. These offices, also, can help a SME in attracting new consumers and enhances its understanding and information on business and investment climate in the concerned foreign country. Among all the forms of OFDI, this strategy requires relatively low amount of investment and less risk.

To achieve critical success in export activities, liaison and branch offices are not sufficient for Indian pharmaceutical SMEs. They need to develop their overseas presence in the form of trade supporting infrastructure like warehouse, distribution outlets, customer care centre, etc and also in different locations in a foreign country. This requires large investments and risks to be undertaken by an SME. In this context, OFDI in the form of establishing marketing and distribution joint venture with local parties in a host country can be an attractive strategy. The host country partner is likely to provide local contact, valuable market and non-market information (e.g. legal information), and share financial risk in developing sales infrastructure to support the products of Indian exporting firms. In spite of its proven advantage, this form of OFDI has a number of drawbacks like sharing of management control with host country partners who might have different business models and views, loss of control over the ways in which the Indian SME's products are marketed and serviced, and the need to share export profits with the local partners.

The above mentioned disadvantages that characterize marketing joint venture strategy can be avoided by Indian pharmaceutical SMEs if they use OFDI as a way to establish their own sales and marketing subsidiary. In this case, the Indian entities undertake full burden of developing overseas trade supporting networks and also possess full control over the specific nature of the marketing operation. Clearly this involves greater financial responsibility on the part of an SME than earlier two OFDI strategies.

The next form of OFDI with comparatively greater risk and investment is undertaking production in a host country through a manufacturing joint venture. In this case, the Indian SME is required not only to share large fixed investment associated with building different fixed assets like factory, machinery, etc., but also to transfer technological knowledge to the overseas joint venture entity. This strategy involves the risk of loss of control over the use of technology transferred to the overseas joint venture and divergence of business interests with host country partners which often lead to complex legal issues.

Overseas manufacturing subsidiaries are the extremely sophisticated form of OFDI that SMEs can opt for. Operating a foreign manufacturing facility possess higher financial and legal risk than any other form of OFDI. The main purpose of such a strategy is to exploit firm-specific advantages in collaboration with host country locational advantages like large market size, good infrastructure, cheap man power, etc. This strategy ensures complete control over firm-specific advantages and maximizes their revenue productivity.

Amongst all forms of OFDI discussed above, there seems to be immense potential of Indian pharmaceutical SMEs undertaking export-promoting types OFDI like establishing liaison/branch offices, marketing joint ventures and sales subsidiaries aboard. The other alternative forms of OFDI such as manufacturing joint ventures and subsidiaries are also important for transnationalization but the scope appears to be limited because Indian pharmaceutical SMEs are suffering from limited financial and other resources. Pharmaceutical SMEs that are engaged in export activities can benefit greatly by performing export-promoting OFDI. To promote this type of OFDI, it is essential to make pharmaceutical SMEs conscious about their overall benefits.

It is important to note that very recently a number of pharmaceutical SMEs are exploring the medium of OFDI to integrate in a globalizing market. Between April 2006 and March 2007, a total of six pharmaceutical SMEs received approvals to undertake as many as 11 OFDI projects of which majority (numbered 8 projects) are for manufacturing in the host country and just 2 are for trading purposes. This shows that the OFDI potential of Indian pharmaceutical SMEs is not just confined to trading OFDI but manufacturing OFDI has been a major OFDI alternative for them. Indian pharmaceutical SMEs have invested in majority of the cases in world's most biggest and lucrative generic market, USA. Germany, Brazil and China are other investment destinations chosen by these SMEs. Majority ownership has been the most preferred mode of OFDI (Table 4.5).

In Chapter V, we have explored the case of OFDI for Indian pharmaceutical SME sector through case studies of four pharmaceutical SMEs that have undertaken OFDI very recently.

Table- 4.5
Outward Investment by Pharmaceutical SMEs, April 2006–March 2007

SME Name	Nature of Operation	Country of Investment	Ownership	(In US$ Million)			Year	Month
				Equity	Loan	Guarantee		
Emcure Pharmaceuticals	Manufacturing	USA	JV	0.86	0	0	2006	May
Wallace Pharmaceuticals P Ltd	Manufacturing	USA	WOS	0.001	0	0	2006	May
Venus Remedies P Ltd	Manufacturing	Germany	WOS	3.6948	0	0	2006	June
Zenotech Laboratories Ltd	Manufacturing	Brazil	WOS	0.0988	0	0	2006	July
Kerala Ayurveda Pharmacy Ltd	Trading	USA	WOS	0.115	0	0	2006	August
Kerala Ayurveda Pharmacy Ltd	Trading	USA	WOS	0.3049	0	0	2006	August
Kerala Ayurveda Pharmacy Ltd	Manufacturing	USA	WOS	0.1	0	0	2006	August
Zenotech laboratories Ltd	Manufacturing	Brazil	WOS	0.073	0	0	2006	October
Emcure Pharmaceuticals	Manufacturing	USA	JV	0	1.45	0	2006	December
Amol Pharmaceuticals Pvt Ltd	Trading	China	WOS	0	0	3	2007	January
Zenotech Laboratories Ltd	Manufacturing	Brazil	WOS	0.042	0	0	2007	March

Note: JV- Joint Venture and WOS- Wholly-owned Subsidiary

Source: Based on data collected from Reserve Bank of India through Ministry of Finance, Government of India.

4.4 Conclusions

Pharmaceutical SMEs have played an instrumental role in promoting total pharmaceutical exports from India during 1970s-1980s. However, the export share of these firms plummeted to 2.4 per cent in 2001-02. The large pharmaceutical firms, on the other hand, have experienced rapid export growth with faster rise in their export intensities. The relatively lower export performance of SMEs required an urgent attention to identify factors inhibiting exports from the SME sector.

The study has undertaken a quantitative analysis to identify factors that influence export activities of pharmaceutical SMEs. The in-house R&D capabilities of SMEs have been found to be an important promoter of their transnationalization through

export activities. As the current level of R&D investment by SMEs is quite low, measures to propping up indigenous technological activities of SMEs is, therefore, required for increasing SMEs involvement in international markets. To the extent possible, the emphasis should be on developing a culture of collaborative research among SMEs through cluster approach and ensuring efficient linking of their innovative activities with national laboratories, universities and research institutions.

Another significant factor for SMEs export performance is the imported capital goods and machinery. New capital goods embody modern process technologies and possess specification required for good manufacturing practices in overseas markets, therefore, endow the importing SMEs significant export advantages. In this context, it is quite important that government policy of the export promotion of capital goods (EPCG) scheme should be revamped for pharmaceutical SMEs. To enjoy this benefit, in general firms are required to undertake a specified export commitment and also required to file bond with bank guarantee if a firm's export is below Rs. 1 crore. Clearly, these conditions are quite restrictive on the parts of pharmaceutical SMEs who are currently upgrading their good manufacturing practices. It appears to be a good policy to permit free imports of capital goods to pharmaceutical SMEs without any conditionality for a ten-year period so as to allow them modernizing freely to meet the new global patent regime. Clearly, these modernized SMEs will be forced to go global via exporting when competition becomes steeper in the domestic market and hence policy is not required to put any export commitment for importing capital goods. The export activities of pharmaceutical SMEs were observed to be insignificantly depending upon the purchase of overseas technology through licensing from foreign technology owners.

The SMEs export activities are also found to be crucially dependent upon various fiscal incentives granted by the government. This clearly shows that export position of SMEs can be significantly enhanced by ensuring participation of rather large numbers of SMEs that failed to avail these benefits merely because of immense transaction costs and difficulties posed by existing procedural hurdles.

Firm size has been another important factor affecting SMEs export behaviour. It appears from this that government export promoting policy has to be necessarily discriminatory in nature with incentives given to firms going up towards the lower spectrum of firm size distribution. SMEs are suffering from size disadvantages in exporting, thus, deserving more policy supports than that required by large enterprises.

Foreign ownership has been export restricting given the domestic market seeking nature of foreign investment in Indian pharmaceutical industry. The SMEs export intensity has been found to be lower in the liberalized phase as compared to the pre-liberal period. This suggests that large number of pharmaceutical SMEs devote relatively more attention on domestic markets to sustain their existing market shares in the face of globalized competition in the liberalized phase. This strategy is certainly a counter productive one for SMEs because competing in the narrow domestic market is likely to generate scale-disadvantage because of shrinking market share whereas focusing on a global market would offer large business opportunities. Pharmaceutical SMEs after upgrading their manufacturing facilities at par with different types of GMP, it is in their own interest to explore export possibility and the policy makers should provide them with immediate cheap finance for transnational expansion as they have just undertaken substantial investment in implementing GMP provision. The other variables such as firm age, domestic market power and product differentiation activities were observed to have mixed impact for individual firms with overall not so strong impact on export activities of pharmaceutical SMEs.

Indian pharmaceutical SMEs have a great potential of transnationalization through direct investment aboard. OFDI for building trade-supporting infrastructure per se appears to be an ideal form given their key capabilities and attitudes. Limited financial and managerial resources of SMEs may not allow them to undertake higher and sophisticated forms of OFDI like manufacturing in host countries thorough joint venture with local partners or through wholly-owned subsidiary. These SMEs can simply export their products from India and undertake trade-supporting OFDI to further boost their export performance. The actual OFDI data for Indian

pharmaceutical SMEs shows that the most preferred mode of OFD is manufacturing OFDI and mostly directed at the developed countries like USA and Germany.

Chapter V

CASE STUDIES OF SELECTED PHARMACEUTICAL SMEs

5.1 Case Studies of Exporting Firms

The quantitative analysis undertaken in the previous chapter has shown that SMEs export performance is substantially determined by a host of firm-specific characteristics like R&D, imports of new capital goods, various fiscal incentives granted by the Government, firm size, etc. However, there are several factors or firm-level strategies that motivate SMEs' participation in international market but are not amenable to any quantitative tools of analysis. This chapter undertakes case studies of selected export-oriented SMEs to specifically examine, where possible, those aspects of firm's export behaviour not captured by quantitative approach. Based on information gathered from company's annual report, their websites and various press clippings, it presents case study of six export-based SMEs, operating in different parts of India; incorporated during different phases of India's economic development; and with varying export intensities and provides a background on strategies undertaken by them to develop international business (Table-5.1). An attempt has also been made to include firms dealing with A*yurvedic* and *Herbal* products as different from allopathic drugs. In the previous Chapter, the cases of three pharmaceutical SMEs namely Fermenta Biotech, N G L Fine-Chem and Bal Pharma has already been discussed with reference to firm's innovation strategy for export expansion (see Annexure-2).

Table-5.1
Selected SMEs for Case Study

Name of SME	Location	Incorporation Year	Export Intensity (%)	Year of Export Data
Auro Laboratories Ltd.	MIDC Industrial Area, Tarapur, Boisar, Thane Maharashtra	1989	20.44	2005–06
P I Drugs & Pharmaceuticals Ltd.	Vardhaman Industrial Complex, Lal Bahadur Shastri Marg, Thane Maharashtra	1985	32.57	2005–06

Tonira Pharma Ltd.	G I D C Estate, Nandesari, Vadodara Gujarat	1992	86.75	2005–06
Venkat Pharma Ltd.	Banjara Hills, Hyderabad Andhra Pradesh	1989	90.31	2004–05
Ozone Pharmaceuticals Ltd.	Janak Puri, New Delhi	1991	NA	
A B L Biotechnologies Ltd.	Kamaraj Nagar, Tiruvanmiyur, Chennai Tamil Nadu	1992	NA	
Fermenta Biotech Ltd.	Dil Complex, Ghodbunder Road, Majiwada, Thane (West), Maharashtra		48.49	2004–05
N G L Fine-Chem Ltd.	TTC MIDC Indl.Area, Pawane Vill., Thane Belapur Rd., Navi Mumbai Maharashtra	1981	95.64	2004–05
Bal Pharma Ltd.	Bommasandra Industrial Area Anekal Taluk, Bangalore Karnataka	1987	19.97	2004–05

5.1.1 Auro Laboratories Limited

Auro Laboratories[7]—a manufacturer of bulk drugs and generic formulations—was founded and incorporated as a Private Limited Company on May 26, 1989 by two Deorah brothers, Sharat Deorah and Satish Deorah. Both these brothers after gaining business experience in various activities like road transport, tea warehousing and bulk drugs for nearly two decades, saw the opportunity of establishing their own company after India adopted a process patent regime and enacted policies favouring small firms. They had access to a process technology to produce a bacteriostatic antibiotic named Trimethoprim (TMP) of GlaxoWellcome, primarily used in the treatment of urinary tract infections. This was the period when Indian policy markers were busy in promoting indigenous production of technology intensive bulk drugs and the new company did not have much difficulty in securing a plot of land at MIDC Industrial Area from the State Industrial and Investment Corporation of Maharashtra and financial assistance from Maharashtra State Finance Corporation. The manufacturing plant was successfully set up and started producing from July 1992 with a total production capacity of 60 TPA (tonnes per annum) of TMP. In the next year the company decided to produce the basic raw material used in the production of TMP and commence the production of 3-4-5 TRIMETHOXYBENZALDEHYDE (TMBA). Since the two promoters of the company had prior experience with exporting business of bulk drugs from India, the export decision of Auro Laboratories was immediate with the commencement of

[7] http://www.aurolabs.com/

production. During 1993–94, the company had exported about 50 per cent of total TMP production with export amounting worth Rs. 45 lakh[8]. Starting with the exports to developing countries such as Malaysia, Singapore, South Africa, Brazil, the company expanded its export focus to European countries such as Spain, United Kingdom and Germany.

Over the years the company diversified into manufacturing of Metformin Hydrochloride and Glibenclamide belonging to the anti-diabetics drugs segment and into contract manufacturing. As exporting demands strict quality controls, the company has obtain ISO 9001:2000 quality certification in 2004 and adopted cGMP norms for its manufacturing facility. These measures have certainly help the company in maintaining its export levels at an average level of 30 per cent during 1999–2006 (Table-5.2). In spite of the fact that the company continued to operate in a narrow range of product area, exports has played a major role in sustaining its growth performance.

Table- 5.2
Gross Sale and Exports of Auro Laboratories Limited

Indicator	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Gross Sales (Rs, crore)	7.68	3.96	1.22	1.36	2.76	2.02	4.50
Exports (Rs, crore)	2.18	0.75	0.41	0.22	1.30	1.11	0.92
Export Intensity (%)	28.39	18.94	33.61	16.18	47.10	54.95	20.44

Source: Prowess Database, CMIE.

However, the growth of the company received setbacks during1999–2003 because the company continued to ignore the importance of technological improvement. It had spent little to strengthen its in-house R&D capabilities. The experience of Auro Laboratories brings out a very important fact that only quality improvement is not enough for sustaining export and domestic market performance unless that is strongly supplemented by technological improvements.

[8] History of Auro Laboratories, access at http://content.icicidirect.com/research/HistoryCompany.asp?icicicode=AURLAB

5.1.2 P I Drugs & Pharmaceuticals Limited

This company was originally incorporated as Visistha Trades & Finance Limited[9] on June 28, 1985 with the Registrar of Companies, Maharashtra. The business operation of the company got diversified into pharmaceuticals from trade and finance when it collaborated with Mr. Aditya R Desai to promote a private limited company named P I Drugs and Pharmaceuticals Limited and registering the same with the Registrar of Companies, Maharashtra in 1991. Mr. Desai, an entrepreneur with a bachelor's degree in commerce, in turn has roped in three skilled and experience executives, Mr. L N Bhatt, S V Shanbhag, and S N Jagannath—who had over two decades of experience in the pharmaceutical industry. Under a dynamic team of entrepreneur and managers, the promoted company achieved its foothold in the domestic market by supplying specialized quality formulations and bulk drugs in the human and animal healthcare segments and got involved into sporadic exporting from India by late 1990s.

With a view to enhance technological capability the company had established two Research and Development Centres at Bangalore and Kumta. In 2003, Visistha Trades entered into a conglomerate merger with P I Drugs and the merged company was renamed as P I Drugs & Pharmaceuticals Limited. Since 2003-04, exporting has become a regular strategy of the company. In order to ensure supply of quality drugs in Indian and international markets and to conform to the recently policy requirement of compulsory WHO-based GMP, the company has improved its manufacturing practices to the specified standard. The R&D effort of the company led to rationalization of its cost, increase in efficiency, process improvement and diversification of product basket. The company which started with introduction of Albendazole, later developed its expertise and specialization in chemical synthesis of Anthelmentic Products namely Benzimidazole.

With quality upgradation and supporting role of in-house R&D centres targeted at product development for international markets has been showing encouraging

[9] http://www.pidrugs.com/

results for the company. The sales of the company has increased by 63 per cent from Rs. 20 crore in 2003–04 to Rs. 32.6 crore in 2005–06 and the growth rate of exports has been phenomenal between the corresponding years at 322 per cent. The share of exports in sales has gone up from about 12.6 per cent in 2003–04 to a high of 32.6 per cent in 2005–06 (Table-5.3). Regionally, the export market for the company became broader with countries from Europe, South America, Asia, and Africa. The export performance of the company can be predicted to get better as it is trying to obtain international regulatory approvals from other agencies and entering with strategic alliance with foreign companies. However, the allocation fund for R&D by the company is inadequate and to achieve any effective push on the export front requires increase in the proportion of sales directed at R&D from current 1 per cent level to at least 4-5 per cent. The company continued to pursue its inorganic growth strategy by acquisition route as it had recently acquired Elixir Chemicals Pvt Ltd, an unlisted pharmaceutical company for Rs 7 crore with the basic objective of strengthening its position in the domestic market[10].

Table-5.3
Sale, Exports and R & D Expenses of P I Drugs & Pharmaceuticals Limited

Indicators	2003-04	2004-05	2005-06
Gross Sales (Rs. Crores)	19.98	25.59	32.64
Exports (Rs. Crores)	2.52	7.79	10.63
R & D Expenses (Rs. Crores)	0.35	0.2	0.34
Export Intensity (%)	12.61	30.44	32.57
R & D Intensity (%)	1.75	0.78	1.04

Source: Prowess Database, CMIE.

5.1.3 Tonira Pharma Limited

Tonira Pharma[11] came into being as a Private Limited Company in 1992, following the transfer of all the assets and liabilities including trade marks, patents, etc., of Pharmachem Laboratories to itself with effect from October 16, 1992[12]. The acquired

10 Hindu Business Line 2006) 'PI drugs to buy Elixir Chem for Rs 7 cr', 21 April.
11 http://www.tonira.com/
12 http://content.icicidirect.com/research/HistoryCompany.asp?icicicode=TONPHA

entity was a partnership firm engaged in manufacturing and trading in chemicals and bulk drugs since 1987.

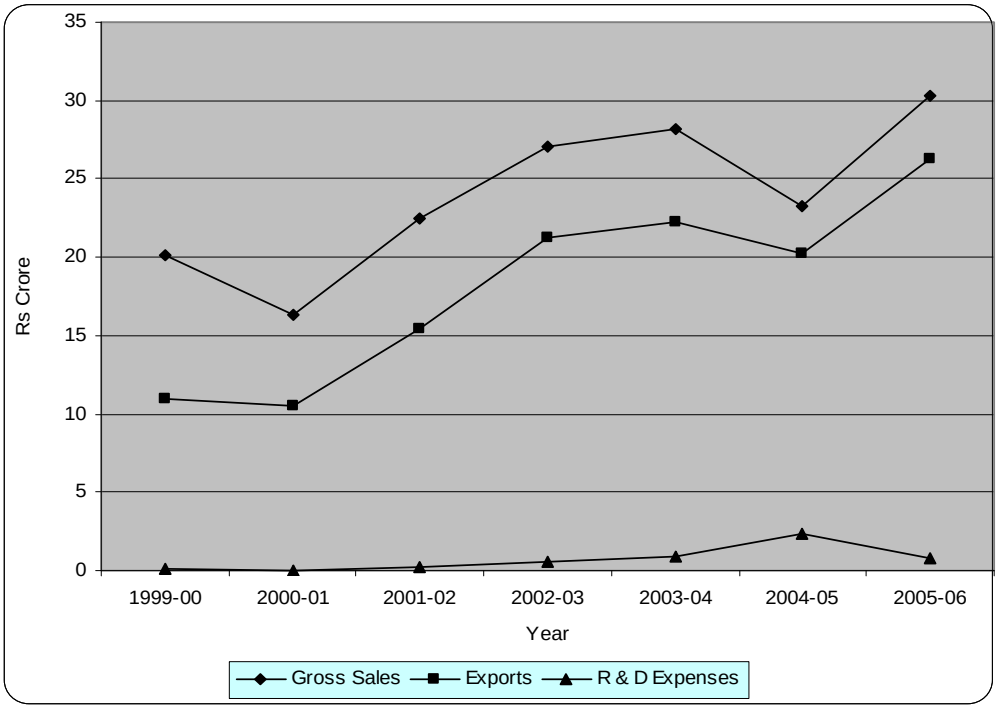
After taking over a running business unit, Tonira Pharma decided to expand its bulk drugs manufacturing facility located at Ankleshwar, Gujarat and to foray into formulation. With this purpose the company entered into Indian capital market in 1995 and raised resources to finance increase in installed capacity of active pharmaceutical ingredients and setting up of a new formulation unit. From these early days, Tonira decided to primarily specialize in exports of bulk drugs from India and has received the status of an export oriented unit from Government of India.

Since the objective was to be a competitive global supplier, Tonira has given crucial importance on quality products in its expansion-cum-diversification plan and has consciously upgraded its manufacturing unit at Ankleshwar (Gujarat) to be WHO-GMP compliant and implemented the manufacturing standards of USFDA for current GMP (cGMP) in its recently commissioned (in January 2005) manufacturing unit at Vadodara (Gujarat). It has also established in-house R&D facilities for process and product development that received recognition from the Department of Scientific and Industrial Research (DSIR), Government of India in 1998. This R&D strategy has given additional new products to Tonira and led to the ownership of five patented products by process in India and foreign countries like Japan, USA and from Europe.

Tonira's importance on innovation and quality has played a major role in its export success and by 2001, about 64 per cent of its sales originated from export markets. Since late 1990s, the company has been pursuing the route of contract manufacturing and strategic alliances to further boost its export business. It has entered into strategic alliances with an increasing number of foreign companies such as Schweizerhall (Singapore/Germany), Deshores (France), Nutrivete Corporation (USA), Chemo Iberica (Switzerland), Samaha Company (Egypt), and Pharmaline (Italy) for supply of bulk drugs and intermediates. It has significantly increased its R&D investment from just 1 per cent of sales in 2002 to 10 per cent in 2005. With

these measures, the export performance of the company reached to 87 per cent of sales in 2005 with the volume of exports doubling between 2001 and 2005 (Figure-5.1). The company presently exports to about 40 countries and given its strategies of innovation, quality management, strategic alliances; it is expecting to enhance its export performance further.

Figure- 5.1
Selected Performance Indicators of Tonira Pharma



5.1.4 Venkat Pharma Limited

Venkat Pharma[13] is a leading pharmaceutical SME, based in Hyderabad and incorporated in 1989. The company mainly deals with manufacturing of pharmaceutical finished doses, active pharmaceutical ingredients (APIs), pharmaceutical formulation intermediates (PFIs) and nutraceuticals or dietary supplements. Although it was incorporated in 1989, it started manufacturing and sales of pharmaceutical products only in 1992. To expand its investment and enter into overseas market, it became a listed company in 1992.

The company started its export activities in 1994 and has adopted a number of strategies to expand its export market. Aggressive marketing with product registration in overseas markets and entering into strategic alliances with foreign firms have been important tools adopted by this company in its drive to transnationalize. Its strong initiative to improve standards of product quality has enforced the confidence of its business partners across the globe. This international

[13] http://www.venkatpharmaltd.com

product quality and competitiveness in terms of pricing and efficiency has been commensurately met by the company's constant efforts to enhance its research and development capabilities for innovating new product, process and improvement of existing product mix. The company's manufacturing facility has been fully upgraded to cGMP and has been certified with ISO 9001:2000 standards. Over the years, the company has generated additional funds to undertake aggressive marketing of their products and services. To further expand its overseas market, the company is currently negotiating with some major players in US and EU markets, for marketing tie ups of finished dosage forms in the OTC segment.

As a result of these measures, the company witnessed significant expansion led by higher exports growth. The gross sales of the company increased by two and half times from Rs. 19.71 crore in 1999–2000 to Rs. 51.74 crore in 2002–03. Much of these sales growth is due to rapid rise in export intensity of the company with more than 90 per cent of total revenue derived from export market. Currently, the company is exporting to more than 16 countries including countries in North & South America, Asia and Australia. In January 2005, the company signed MoU with UPHA Corporation of Malaysia for the exclusive manufacturing and supply of branded formulations to be marketed in different countries viz., Malaysia, Singapore, Thailand, Indonesia, Hong Kong, Macau, Taiwan, Papua New Guiena and Maldives[14]. In 2005 it got orders worth of $400,000 for supplying vitamins and dietary supplement products to the US market.[15] Overall the experience of Venkat Pharma shows that the company had performed well, based on R&D and quality capabilities.

[14] Pharmabiz (2005) 'Venkat Pharma signs MoU with UPHA corp of Malaysia for supply of branded formulations', 05 January.

[15] http://www.domain-b.com/industry/pharma/2005/20051102_supplements.html (Accessed on 25.08.2007)

5.1.5 Ozone Pharmaceuticals Limited

Ozone Pharmaceuticals[16] is a relatively young and small pharmaceutical company established in early 1990s. The company was establish by an entrepreneur, Mr. S.C. Sehgal, who after working with a foreign pharmaceutical company named Glaxo for more than seven years decided to start his own venture. The new company commenced its production operation at Bahadurgarh near Delhi and started serving domestic market and a neighbouring foreign country Nepal through exporting. The company mainly manufactures and markets formulation drugs (i.e. allopathic products) for various segments like Antibiotics, Antifungal, Nutrinional, Antiinfectives, Anxiolytics and NSAIDs.

Mr. Sehgal had a vision to make his company a global player and for this he undertook a business tour to New York, London and Paris to identify export opportunities for his products in 1991. In this particular trip he had observed a growing number of ayurvedic products are visible in overseas medical shops, which led him to believe that there is a niche but less explored area of health care system based on herbal medicines[17]. He realized that the market potential for alternative medicines emerging from the USA, UK and France can be immense once the herbal products are well documented and authenticated through established scientific procedures and targeted at modern day ailments of global consumers. With a view to serve this growing opportunity in the field of herbal products, in 1992 Ozone Pharmaceuticals diversified into ayurvedic products based on a well-planned product diversification strategy and after two years of research it launched a herbal cream known as 'No Marks'. This is a specialized product for reduction and removal of marks from the skin. The product was extremely successful and by 1996 the ayurvedic business of the company was separated into an independent entity, Ozone

16 http://www.ozonepharma.com

17 Business Today (2003) 'Hitting A Dead End', 05 January.

Ayurvedics. The company emerged as a strong competitor to big and established firms such as Hindustan Lever and Godrej in the home market[18].

The turnover of the company has grown from Rs. 5 crore in 1995 to Rs. 10 crore in 1997. The increased demand for the products of the company has led to establishment of two additional manufacturing units at Baddi (Himachal Pradesh) and Amingaon (Assam). By 2001, Ozone group has emerged as a national player covering operation in all the states and achieved a sale of Rs. 50 crore in 2002, Rs. 25 crore from Ozone Pharmaceuticals and Rs. 25 crore from Ozone Ayurvedics. An increasing proportion of its sales actually came from exports to new markets like the Middle East, South Africa, West Indies, Malaysia and Canada, where the company started its marketing operations[19]. In an interview in 2002, Mr Sehgal indicated that exports are going to be more than the company's sales in the domestic market[20]. The company has taken the route of R&D as its crucial competitive strategy and has expanded its R&D programme to the tune of Rs 25-crore, half of its sales! Since 1999, it has also pursued an active advertising strategy to create brand names for its herbal products.

As a result of strategic R&D efforts, the company has been a regular introducer of new products from both allopathic (TRANOSTAT, OSIL and specialities in the cardiac and diabetic segment) and ayurvedic areas (e.g. pain-relief cream `Kwik' and eye-care product 'Itis' and hair care products and body contour oils). The company, given its desire to maintain global quality standard of manufacturing, has been first mover among Indian pharmaceutical SMEs to upgrade its infrastructure and production facilities to be in compliance with GMP guidelines as laid down by the WHO. In order to expand its overseas market, the company decided to establish an

[18] Hindu Business Line (2002) 'Ozone Ayurvedic to take on FMCG majors', 02 July.

[19] 'Ozone—The Herbal Approach to Health Solutions' at http://www.techno-preneur.net/ScienceTechMag/feb03/ozone.htm

[20] Hindu Business Line (2002) 'Ozone Ayurvedics plans to introduce more products', 12 September.

overseas sales subsidiary, Ozone UK Ltd[21], in 2005 for undertaking marketing of its products exported from India.

Very recently in August 2007 the Ozone group has set up a strategic business unit named as 'Ozone R&D' whose main function is to target the emerging global market for R&D services in the pharmaceutical sector and to meet product development needs of existing Ozone group companies in allopathic, ayurvedic and natural segments[22]. An estimated Rs. 200 million has been planned for investment in this new unit over the next two years.

Clearly based on an aggressive R&D strategy with diversification into niche areas of herbal products and R&D services and up gradation of quality of production process to serve global consumer healthcare market, the experience of Ozone Pharmaceuticals shows that even an SME can successfully create a well known brand name in a home market dominated by large firms and can tap a global market via marketing and sales outward direct investment.

5.1.6 A B L Biotechnologies Limited

ABL Biotechnologies[23] (ABL) presents the case of a pharmaceutical SME that has recently entered into export markets. Since its incorporation in early nineties, the company has been predominantly preoccupied with gaining a definite position in the domestic markets through a host of strategies including R&D, collaborative marketing arrangement, acquisition and product diversification through establishing domestic subsidiaries in niche areas.

As the company started its operation in a liberalized policy regime, it realized that innovation is the only survival and growth strategy in otherwise a highly competitive domestic market. The hallmark of its innovation strategy has been maintaining a collaborative research programme through joint research development

21 It was set up 2005 at an investment of Rs. 1.5 crore.
22 Moneycontrol.com (2007) 'The Ozone Group launches Ozone R&D', 03 August.
23 http://www.ablbiotechnologies.com

initiatives with institutions of advanced research in India and abroad[24]. It has established its R&D centre at Vishakapatnam, which later received accreditation and recognition from the Department of Scientific Technology (DST), Ministry of Science and Technology, Government of India. It has been a direct beneficiary of public support for R&D and has got a funding of Rs.2 crore from the Drug Development Board[25] of the Department of Scientific and Industrial Research towards research activities. The company has also expanded its research scale and has been in the process of establishing a new R&D facility for drug discovery and bioactives at the TICEL Biopark in Chennai. During 2000–2006, the investment of the company in R&D amounted to be as high as 5.6 per cent of its sales.

ABL has so far developed over 150 formulations both in therapeutics as well as in nutrition, for the pharma industry. In order to expand its share in the domestic market, in 2004, it acquired the entire stake in Shantha Marine Biotechnologies Pvt Ltd, which produces over 75 formulations of beta carotene-based products. Further, the company has collaborated with Texas-based biotechnology company, Samudra Technologies Inc (part of the $25-million Bionexus group), which has helped this company to restructure in terms of commercializing more products and widening its market[26].

The technology focused business approach of ABL has seen launching of several new products in the domestic markets and delivering services to a large segment of the Indian pharmaceutical industry with unique formulations developed in-house. The company has achieved a good market presence in the areas of bio-manufacturing, identification and isolation of marine microbial metabolites of therapeutic value and bio-process engineering. ABL has established two domestic subsidiaries, Samudra Biopharma Private Limited (SBPL), which produces Betacarotene, Lutein, Lycopene

[24] Research Triangle Institute, North Carolina, USA, Kard Scientific,Inc at the Harward Medical School, Boston, the National Facility for Marine Cyanobacteria, Bharathidasan University, Trichy, the National Institute of Oceanography, The Madras University and Dr.A.L.M Post Graduate Institute of Medical Sciences, Madras.

[25] http://www.dst.gov.in/whats_new/press-release06/drug-comp-loan.htm

[26] The Hindu Business Line (2004) ABL Bio to buy partner's stake in Shantha Marine, 30 March.

and other trace Carotenoids from marine algae and Celgen Biologicals Pvt Limited (CellGen), which is India's first facility for the production of the essential fatty acid DHA. ABL has planned to invest a huge sum of about Rs. 100 crore to produce around 100 MT of DHA per annum through CellGen[27]. Obviously these subsidiaries are meant to diversify business areas of the company through concentrating on niche products. With the above measures, the company has been able to enhance its market position with sales growing from just Rs. 1.8 crore in 1999–2000 to Rs. 10.45 crore in 2005–06 (Table-5.4).

Table-5.4
Sale and R&D Expenses of A B L Biotechnologies Limited

Indicators	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06
Gross Sales (Rs. Crores)	1.77	0.53	0.22	0.26	2.55	6.78	10.45
R & D Expenses (Rs. Crores)	0.03	0.12	0.00	0.10	0.24	0.45	0.33
R & D Intensity (%)	1.69	22.64	0.00	38.46	9.41	6.64	3.16

Source: Prowess Database, CMIE.

After a successful entry in the Indian market based on strategic innovation, ABL decided to explore foreign markets. In 2004–05, the company formally started exporting to neighbouring countries. The experience of ABL, thus, shows that a small firm can successfully achieve a critical level in the competitive home market by adopting innovation as a main strategy. Domestic market success will ultimately motivate the firm to go for transnationalization with more confidence and reasonable sets of firm-specific advantages.

5.2 Case Studies of Firms with Outward FDI

In this sub-section, the case of four Indian pharmaceutical SMEs are discussed with the basic objective of examining the characteristics of outward investing SMEs and exploring possible ways in which OFDI affects outward investing SMEs so as to deduce implications for other SMEs.

[27] http://biospectrumindia.ciol.com/content/BioAsia/104031109.asp

5.2.1 Jagsonpal Pharmaceuticals Limited

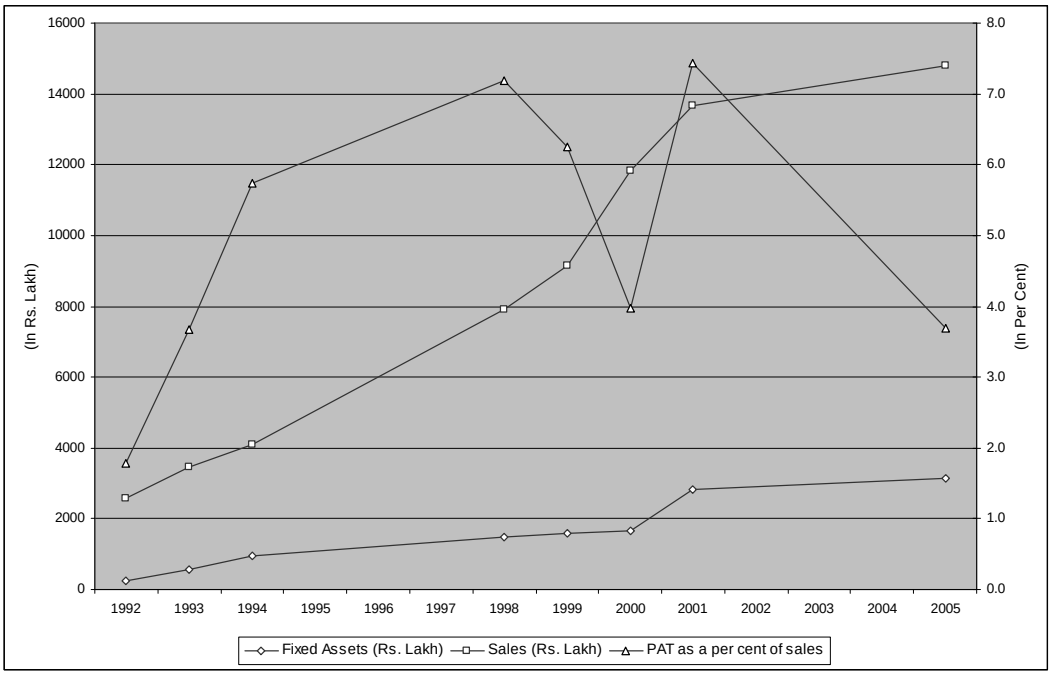
Jagsonpal pharmaceuticals[28], which was established as a chemist shop in Delhi in 1964, later evolved into a pharmaceutical company. It got incorporated as a private limited company in 1978 and then in 1986 became a public limited company by raising capital from Indian capital market. Since then the company has pursued an aggressive growth strategy for expanding its position in the domestic market. The firm, although was basically a family owned concern, has opted for professionally run management and gone for expansion of sales and distribution networks in India. It has also started in-house R&D units for enhancing indigenous technological capabilities. As a result of these strategies, the company achieved secular expansion in sales and has emerged to be amongst the top 50 pharmaceutical companies in India with rank 42 by March 2004[29]. Its sales have grown from Rs. 259.4 million in 1992 to Rs. 1.5 billion in 2005 (Figure-5.2).

In early 1990s, the company started exploring the option of exporting. With a view to promote its export of bulk drugs and active ingredients, the company established an export focused trading subsidiary Jagsonpal Export India (P) Ltd in 1992. In spite of this initiative, exports continued to be an irregular business activity until early 2000s. In the years 1993 and 1994 the company exported about just 2 and 0.79 per cent of total sales respectively. Then the period 1995–1997 saw little exporting by the company and in 1998 Jagsonpal Export India was sold off.

[28] http://www.jagsonpal.com/

[29] domain-b.com (2004) 'Jagsonpal amongst India's top fifty pharma companies', 16 June.

Figure- 5.2
Sales, Fixed Assets and Profitability of Jagsonpal Pharmaceuticals Limited, 1992–2005.



Source: Based on Jagsonpal 26th Annual Report, 2004-05.

In the early 2000s, Jagsonpal was forced to rethink its export strategy due to severe domestic competition, cut throat discounting, and sluggish market trends. To improve its exporting activities, the company adopted the strategy of OFDI and opened up branch offices in New York (USA), Minsk (Belarus) and Warszawa (Poland). Beside this the company has entered into marketing collaborations in a number of countries. As a result of this strategic approach, the company is now regularly exporting to an increasing number of countries such as Russia, Brazil, USA, Ukraine, Sri Lanka, Cameroon, Thailand, Argentina, Germany, Switzerland, Korea, Egypt and Vietnam. The amount of exports in 2004 and 2005 respectively were Rs. 521 and 358 Lakh, about 3 and 2.4 per cent of total sales correspondingly. The company's website describes the role of the overseas presence through branch offices and alliances as follows:

> "Jagsonpal is committed to growth through international expansion. The firm is already a multi-national player with a presence in over 15 countries. Jagsonpal reaps substantial benefits by being a global player. The firm sells its existing products in new international markets. The firm is able to share research and development costs with foreign companies by licensing its own products to them.

> Jagsonpal has also obtained licenses from foreign companies to sell their products in India."[30]

Jagsonpal is likely to benefit from substantial export expansion in the future as the company's trade-supporting OFDI like opening of branch offices has recently begun and their impact can be realized only after some years.

5.2.2 Venus Remedies Limited

Venus Remedies[31] is a small-sized pharmaceutical company established in 1991 with manufacturing of large volume parenterals (LVP) with a product range of 15 products. During 1991–92, the company has a total workforce of 45 with a sale of Rs. 0.25 crore derived from a narrow market focus on two Indian states, namely Punjab and Haryana. Since then the company continuously diversified its manufacturing range to Small Volume Liquid Vial Section (SVP) and added additional number of products to both of its LVP and SVP product range. Strategies such as expansion in production capacity, implementation of quality standards for an entire operation of manufacturing, aggressive expansion in marketing networks to other Indian states, etc., lead to significant growth of the company and in 1993–94, the company's sales crossed Rs. 1 crore mark. The company's market presence expanded to additional states like Rajasthan, Uttar Pradesh, Delhi and Himachal Pradesh.

The company became a public limited company in 1994–95 and raised resources to fund for its expansion plans. The strategy of expansion in product range, marketing, production, quality, etc., led to sharp increase in company's sales to be over Rs. 5 crore in 1995–96. In 1996–97, the company decided to enter into the international market and began exporting to Nepal. In the same year the company established its in-house R&D division and adopted contract manufacturing as a future growth strategy. The company also aggressively pursued information and communication technology (ICT) as a medium of business and introduced large scale

[30] http://www.jagsonpal.com/about_multinational.php
[31] http://www.venusremedies.com/

computerization of work and processes in both office and manufacturing areas. The year 1997–98 saw the company diversifying its export market to five new countries such as UAE, South Africa, Sri Lanka, Kenya and Yemen but its export activities were not a regular feature.

Since 1998–99, the company undertook an extensive consolidation drive to face the impending implementation of a product patent regime and the challenge of cheap imports and entry of foreign players. Several measures were taken for cost reduction, quality improvement and GMP implementation. The business operation of the company was segregated into separate divisions such as I.V. Fluid Sales, Ethical Sales, Veterinary Sales, Generic Sales, Institutional Sales, Third Party Manufacturing and Export Sales Divisions. The company seriously focused on export promotion objective and measures were taken for product registration in a number of countries. Besides direct exporting, the company also started exploring indirect export orders. The company's proactive measures to improve its manufacturing practices, quality, product range, etc., led to achievement of sales over Rs. 18 crore in 2000-01 (Table 5.5). In order to improve its export performance, the company entered into a licensing agreement with a UK based multinational company in 2001-02 for manufacturing of latter's product range for direct exports to Ukraine and CIS countries.

Table-5.5
Performance of Venus Remedies Limited, 2001–2006

Indicators	2001	2002	2003	2004	2005	2006
Gross sales (Rs. crore)	18.14	21.23	20.73	23.7	34.09	92.07
Gross fixed assets (Rs. crore)	7.77	8.18	8.75	9.5	12.73	29.13
PAT as a per cent of sales	4.52	3.86	1.74	5.32	12.09	17.63

Source: Prowess database, CMIE.

In 2005–06, the company adopted manufacturing OFDI as a strategy to expand position in the European pharmaceutical market. In June 2006, the company got an OFDI approval for establishing a wholly owned manufacturing subsidiary with approved equity of US $3.7 million. Venus Pharma GmbH—the newly formed

German subsidiary has in turn acquired an EU-GMP compliant pharmaceutical unit from Bayer AG in January 2006[32].

Since these OFDI activities are most recent, their actual impact on the performance of the parent firm can only be analyzed after a few years. However, it can be stated that having a commercial presence in the regulated EU market can enable quick market penetration for several of the new products that the company is recently launching based on its in-house R&D activities. The company has already filed 5th International Patent Application and has recently filed patent application for an antibiotic in 48 countries[33]. OFDI can certainly help the company to maximize the returns to its patented intellectual properties in foreign markets.

5.2.3 Rusan Pharma Limited

Rusan Pharma[34] is relatively a young pharmaceutical company starting its manufacturing operation of Buprenorphine Hydrochloride in 1994. The company was established by Dr Navin Saxena, a Russian trained scientist who worked in the Unichem Laboratories Research Centre since 1981. During his association with Unichem, he obtained an Indian process patent for Buprenorphine Hydrochloride which later led to the establishment of an independent company.

The company being established by a scientist turned entrepreneur, R&D has been an integral growth strategy of the company. Its innovation drive has been strongly promoted by a research centre in Mumbai established by the founder of the company in 1996. The company continued to expand rapidly based on productivity, quality and innovation. It has also expanded into international markets through exporting. With a view to expand its production capability, the company acquired a Novartis' factory in Kandla Special Economic Zone in 1999. In 2000 the company has received the CHEMEXCIL's (Basic Chemicals, Pharmaceuticals & Cosmetics Export

[32] Economic Times (2006) 'Venus Remedies buys German unit', 31 January.

[33] PHARMABIZ.com (2006) 'Venus Remedies Files 5th International Patent Application', 14 July; Economic Times (2007) 'Venus files antibiotic patent application in 48 nations', 15 June.

[34] http://www.rusanpharma.com/

Promotion Council) award for outstanding export performance. By 2002, the company has upgraded its formulations and bulk drugs manufacturing facilities to be WHO-GMP compliant and received accreditation for the same.

The company has implemented manufacturing practices in compliance with the overseas regulatory frameworks for improving own export performance. Its formulations manufacturing facility received accreditation from overseas authorities of UK, South Africa, and Zimbabwe in 2003. The company started exporting generics to UK and South Africa and expanded market focus to Sudan, Syria, Ethiopia, Egypt, Bangladesh, and UAE.

In early 2000s, the company realized that overseas presence is critical for export performance and adopted the strategy of OFDI. The company started opening up its branch offices in countries such as Russia, Ukraine, Uzbekistan, and UAE and entered into strategic alliances in several other countries. As a result of these efforts, export grew by 166 per cent between 2003 and 2004 from Rs. 7.15 crore to Rs. 19.03 crore in 2004 (Table 5.6). Exports constituted above 66 per cent of gross sales of the company in 2004. The CIS region has emerged as the top export market for the company followed by UK and South Africa.

Table- 5.6
Performance of Rusan Pharma Limited, 1999-2004

Indicators	1999	2000	2001	2002	2003	2004
Gross sales (Rs. crore)	3.2	64.0	23.0	12.8	11.1	28.7
Gross fixed assets (Rs. crore)	1.77	2.34	3.21	15.69	15.83	15.65
PAT as a per cent of sales	19.7	27.4	19.6	6.7	-17.9	12.8

Source: First Source and Prowess database, CMIE.

5.2.4 Paras Pharmaceuticals Limited

Paras Pharmaceuticals[35] is presently a medium-sized pharmaceutical company with a total sale of Rs. 202 crore in 2005. The company, incorporated in 1980, is engaged in the manufacturing of over the counter drugs and personal care products. The company was predominantly a domestic player for nearly a decade concentrating on

[35] http://www.paraspharma.com/

developing innovative brands and strong distribution networks in India. It has identified niche gaps in the existing OTC market and strategically positioned its products with heavy product differentiation activities. These strategies led to consistent successes of the company and its brand portfolio like Moov, D'Cold, Krack, Borosoft, Dermicool, Stopache, and Itch-Guard are among top brands in India.

After gaining a good ground in the domestic market the company started focusing on international markets recently. In 2000, the company exported about Rs. 2.4 crore, accounting for just 2 per cent of its total sales. In order to boost its export activities, the company recently floated two wholly-owned overseas subsidiaries—*(i)* Paras Overseas Holdings Llc, Dubai; *(ii)* Paras Inc., USA. Paras Overseas Holdings was established on February 12, 2005, which in turn established a marketing and distribution company named Paras Global HE at Jabal Ali, UAE on July 24, 2005.

Paras Inc., has contributed over US $19 million of sales during 2004–05 as compared to the sales of US $0.89 million for a six months period during 2003–04 (Paras 25th Annual Report, 2005). This subsidiary has a net worth of US $ 3.8 million and generated a profit of US $ 18 thousand in 2004–05. The information on the performances of recently established subsidiary, Paras Overseas Holdings and the step down subsidiary, Paras Global HE is not available.

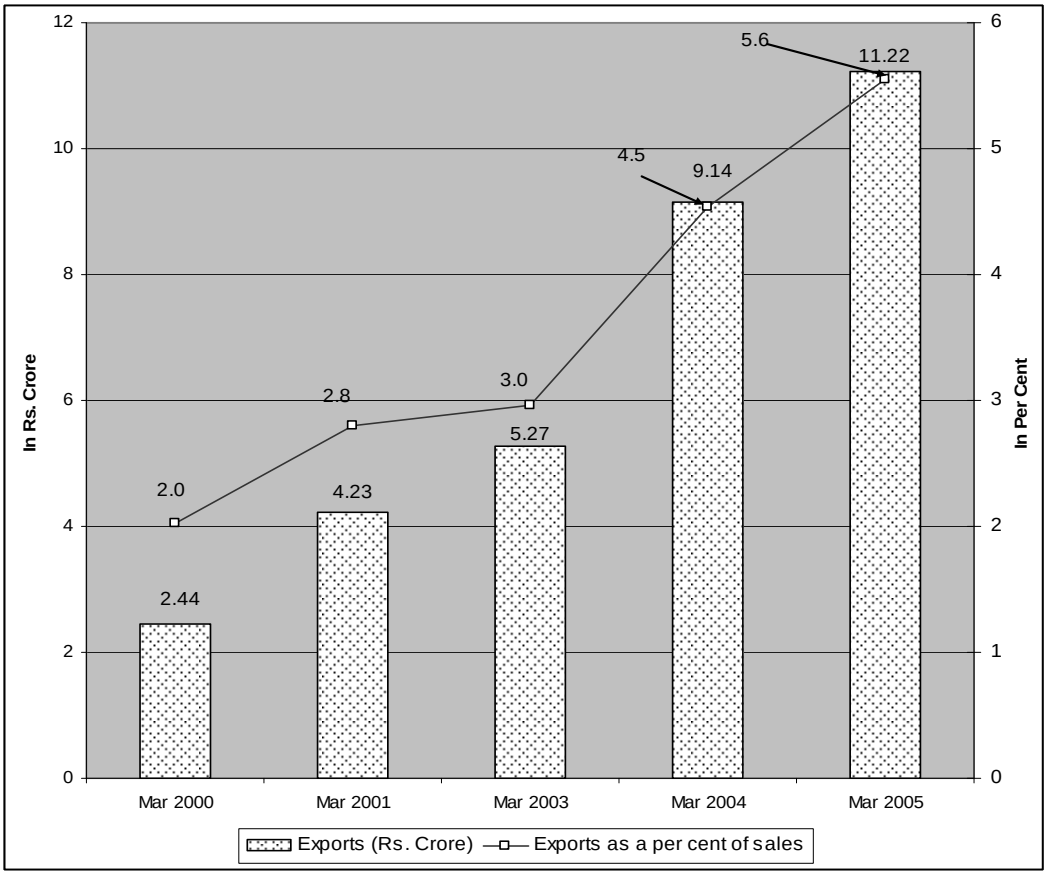
It can be seen that after the starting of operation of American subsidiary, Paras' exports more than doubled from Rs. 5.3 crore in 2003 to Rs. 11.2 crore in 2005. As a result, the contribution of exports to the sales of the company has grown from 3 per cent in 2003 to 5.6 per cent in 2005 (Table 5.7 and Figure 5.3). The company's export in coming years is likely to increase significantly as the other two overseas subsidiaries have already commenced their commercial operations.

Table- 5.7
Performance of Paras Pharmaceuticals Limited, 1999-2004

Indicators	2000	2001	2003	2004	2005
Gross sales (Rs. crore)	120.21	150.96	177.92	201.6	202.08
Gross fixed assets (Rs. crore)	12.94	17.58	21.63	20.82	21.45
PAT as a per cent of sales	2.87	12.55	13.52	15.58	14.59

Source: Prowess database, CMIE.

Figure- 5.3
Export performance of Paras Pharmaceuticals, 2000–2005



5.3 Conclusions

The above discussion clearly indicates that the transnationalization process of Indian pharmaceutical SMEs are diverse and they are essentially firm-specific in character. There are SMEs who have gone along the traditional process of transnationalization viz. first to expand in the domestic market and then widening their base into overseas markets. P I Drugs, Ozone Pharmaceuticals and ABL Biotechnologies belong to this group of SMEs. As opposed to this group, there is another group of SMEs like Auro Laboratories, Tonira Pharma, Venkat Pharma, who started exporting since very early years of their commencing production.

The experience of majority of SMEs under case studies suggests that transnationalization process of firms is critically dependent upon firms' technological capacity building. Contrary to the general perception that small firms due to resource limitation would like to adopt soft/marginal innovation strategy, the present case

studies indicate that SMEs have made conscious and consistent strategy for up grading their innovative strength and allocated a significant proportion of their limited sales in risky R&D efforts. It is important to note that an SME like ABL has been maintaining a close innovative link with research institutions, which is often a missing link in innovation system of developing countries like India.

Another important strategy that has significantly impinged upon the exporting process of Indian SMEs has been their drive to upgrade their manufacturing process to the levels currently existing in the global industry and ensure global standard of quality in the products manufactured. The case of Auro Laboratories indicate that even a small enterprise can operate globally with just concentrating on product quality although it is a different matter that quality alone may not ensure the existing market share for long.

Indian SMEs are also exploring strategic alliances with foreign firms and engaged in M&As to expand their market position. It is also important to emphasize that the most of these SMEs under case studies relied on their individual resources to develop their own innovative and other strategies. The role of public support has been extremely limited with exception in the case of ABL technologies. Therefore, the internationalization process of Indian pharmaceutical SMEs is largely led by their in-house efforts in terms of innovation, product diversification, adoption of new technology, aggressive marketing, acquisition of firms, and so on.

The case study of four Indian pharmaceutical SME with OFDI offers a number of tentative observations relating to the OFDI behaviour of these firms. These are tentative because OFDI projects undertaken by the selected SMEs are most recent and the long term impact of OFDI on firms' performance can be observed only after a few years. Outward investing pharmaceutical SMEs seem to benefit from expanding export performance. OFDI provides a means to improve one of the most relevant aspects of global competitiveness, namely, the provision of a high quality of after-sale services via enhancement of trade-supporting infrastructure abroad. The experience of Jagsonpal and Paras Pharmaceutical corresponds to the export

promoting role of OFDI. This result is inconformity with the past empirical evidence that OFDI by Indian manufacturing firms has been largely export encouraging from India (Pradhan, 2007d). Among factors that positively affected the export engagement of SMEs are domestic competition, technological activities, and quality improvements.

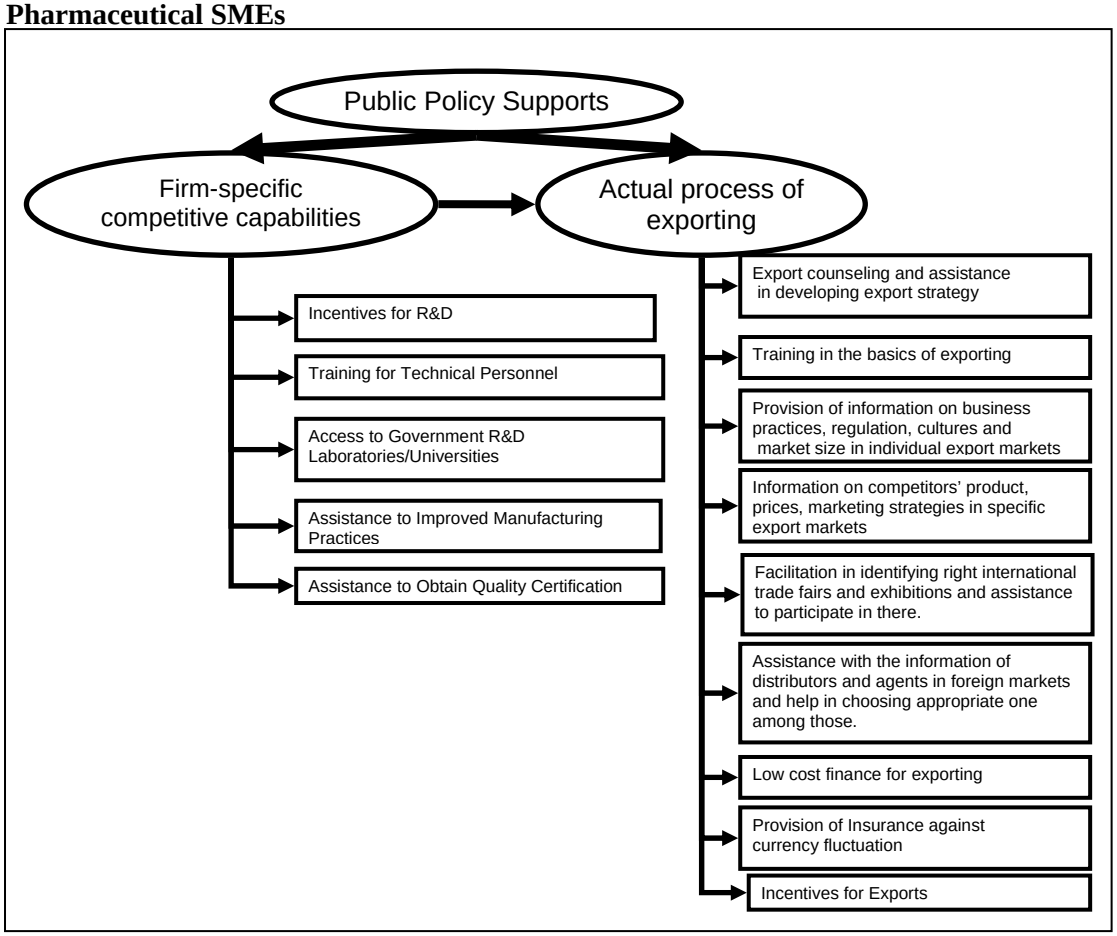
Chapter VI

GOVERNMENT'S MECHANISMS FOR TRANSNATIONALIZATION OF PHARMACEUTICAL SMEs

6.1 Introduction

As Indian pharmaceutical SMEs are lagging far behind their large counterparts in export activities, the export promoting role of public policy needs to be redefined. There are two ways in which government policy can improve export performance in domestic firms (Figure-6.1). First, it can assist domestic firms in improving their firm-specific competitive capabilities like R&D, skills, quality, etc. Second, government can directly assist these firms in actual process of undertaking export activities. In both these policy components, it is important to have a discriminatory policy that takes into account size-specific heterogeneity. The policy regime should be designed in such a way that it provides relatively larger support to SMEs as compared to large firms because they suffer from several size-related disadvantages like inadequate finance, low R&D, management constraint, inadequate market information, etc. By addressing issues that urgently concern exporting SMEs and that prohibit presently non-exporting SMEs to pursue exporting can really improve the transnationalization of SME sector. Does the existing policy regime for exports in India follow such a differential practice for SMEs? This chapter specifically examines the above question for Indian pharmaceutical SMEs and shall attempt to suggest some policy measures that can help boosting SMEs' export activities.

Figure-6.1
A Framework for Redefining Government Role in Transnationalization of Pharmaceutical SMEs



6.2 General Growth Assistance

This involves a wide range of assistance and measures undertaken by the government to support pharmaceutical firms' growth and their competitive strengths.

6.2.1 Finance

Finance has been identified as the key factor inhibiting the growth of Indian SME sector (Morris *et. al.,* 2001). As a result the government has categorized SME sector as a priority sector for credit lending by banks and financial institutions and consistently the cost of credit to the SSI sector has been kept below market rate. As per RBI guideline small firms are exempted from pledging collateral with banks for getting loans and assets created from loan should be treated as security. In spite of

these provisions, banks are most often observed to have denied credit to small firms due to failure in providing security (Das, 2006). In fact, between 1991 and 2003 the proportion of bank credit to small firms been declined from 16 per cent to 11 per cent.

The National Equity Fund set up under Small Industries Development Bank of India (SIDBI) has been in operation since August 1987 to provide equity support to small companies for starting new project and for rehabilitation of existing small units that are potentially viable but sick. This fund enables a small entrepreneur to start his venture if he is able to contribute just 10 per cent of the total equity capital requirement of the venture. SIDBI contribute 25 per cent of the equity capital and rest is ensured through bank loans. Since 2000–01, the Credit Guarantee Fund Trust for Small Industries (CGTSI) jointly established by the Government and SIDBI has been functioning to tackle the problem of collateral guarantee in the case of credit to the small-scale units. CGTSI started providing guarantee against loans to small and tiny enterprises but it has been far from successful in motivating banks to enhance their credit exposures to these small units[36].

In October 2004, Small Industries Development Bank of India (SIDBI) in collaboration with Punjab National Bank (PNB) and Union Bank of India (UBI) launched a special venture capital fund known as the SMF Growth Fund to provide long-term risk capital finance to technology-intensive domestic SME units in India[37]. This fund with a corpus of Rs 500 crore covers large number of growing sectors including pharmaceutical industry. As the size of this venture capital fund is small in relation to the large number of existing SMEs from all sectors, it may not be able to adequately meet the requirement of pharmaceutical SMEs.

The above discussion shows that in the case of credit flows, the government has taken measures to ensure that SMEs sector in general has access to financial resources. However, targeting SMEs from all sectors with limited government

[36] Economic Times (2004) 'Banks keep 'safe distance' from SSIs', 19 March.

[37] Economic Times (2004) 'Sidbi, PNB, UBI set up Rs 500-cr SME fund', 26 October.

resources creates its own limitation in the long run. It is important to target only knowledge-intensive sectors that generate high value addition, grow faster and generate widespread knowledge spillovers in the economy. Also the financial support to SMEs from these technology-intensive sectors must be linked to their participation in international markets after certain years of domestic operation. Further, special credit should also be advanced to SMEs to finance the pre- and post-shipment expanses.

6.2.2 Technology and Training

SMEs from all sectors including pharmaceuticals have been receiving policy support for improving their technological capabilities. Technological improvements can take any form from product and process development to adoption of modern manufacturing practices, higher quality standards, skills, etc. The Department of Science and Technology initiated the Drugs and Pharmaceuticals Research Programme (DPRP) in 1994–95 for promoting business-institutional collaboration aimed at new product development in all systems of medicine. Recently, with an objective of promoting innovation in the pharmaceutical sector, the Government has established a Pharmaceutical Research and Development Support Fund (PRDSF) in January 2004. PRDSF had an initial corpus of Rs.150 crore and has been utilizing interest accrued on it for funding collaborative R&D projects proposed by industry and academic institutions/laboratories and extending soft loan for R&D. Since 24th January, 2006 the PRDSF Corpus of Rs.150 crore has been dissolved and replaced by annual budgetary allocation of Rs.150 crore. Both DPRP and PRDSF have been contributing towards promoting collaborative R&D projects between pharmaceutical firms and national institutions. A number of pharmaceutical firms listed in Table-6.1 have been benefiting from these national programmes on pharmaceutical R&D.

However, above measures by exclusively focusing on collaborative R&D projects do not have any potential to motivate SMEs that are not engaged in R&D activities and also are unable to forge linkages with national research institutions. A significant part of the funding from DPRP and PRDSF has also been extended to various

national institutions for upgrading their research infrastructure. These national institutions should take the lead in identifying research projects for technology development in emerging generics/new drugs and then issuing calls for SME participation in national newspapers or contacting SME industry associations. Interested SMEs shall contribute a part of the proposed cost of R&D project and the technology developed through this collaborative research programme can be made available to each SME associated with the R&D project.

Table-6.1
List of Firms Receiving Financial Support from DPRP and PRDSF

Year	Firm Name
2000–01	Dabur Research Foundation, Alembic Ltd., Cadila Pharmaceuticals Ltd, Glenmark Pharmaceuticals Ltd, Lupin Laboratories Ltd and Arya Vaidyasala.
2003–04	Natural Remedies Pvt Ltd, Sami Labs Ltd, itadel Fine Pharmaceuticals Ltd.
2004–05	Dabur Research Foundation, Indian Medicines Pharmaceutical Corporation Ltd., Lifecare Innovations Pvt. Ltd, Promed Exports Pvt. Ltd., Virchow Biotech. Pvt. Ltd., Ranbaxy Laboratories Ltd., Serum Institute of India Research Foundation, IPCA Laboratories Ltd., Surya Pharmaceuticals, Emmellen Biotech Pharmaceuticals Pvt. Ltd. and Petlad Mahal Arogya Mandal Pharmacy.
2005–06	Zydus Research Centre, Dey's Medical Stores, Ranbaxy Labs Ltd., Indo Bioactive Labs (P) Ltd., Orchids & Pharmaceuticals Ltd, Zydus Research Centre, Rumi Herbals Ltd, Rex (USA) Remedies Pvt Ltd., Microtest Innovations Pvt Ltd, Land Pharma Fabricon Ltd, Dalmia Centre for R&D, Promed Exports Pvt. Ltd., Biological E. Ltd., Microtest Innovations Pvt.Ltd.

Source: Annual reports of DST, Government of India, various years.

In India, SMEs in general have been provided with incentives and support measures to modernize their production facilities with adoption of improved and updated technology. SIDBI's Technology Development and Modernization Fund is in operation from April, 1995 and the scheme has been providing low cost finance (interest at the bank's prime lending rate) for the purchase of capital equipment, technical know-how, upgradation of process technology and products, improvement in packaging and acquisition of ISO-9000 series certification. Under the Scheme of ISO-9000 reimbursement scheme in operation since March 1994, small firms obtaining ISO-9000 certification have been provided with 75 per cent of their expenditure involved subject to a maximum of Rs.75, 000. The Credit Linked Capital Subsidy Scheme for Technology Upgradation was launched in October, 2000, modified in 2005 and ended on 31st March, 2007. This scheme had provided for 15 per cent capital subsidy on institutional loan (not exceeding Rs. 1 crore) taken by

small units from pharmaceutical and other sectors for modernizing their production equipment and techniques.

Of late the government has been taking some measures to help pharmaceutical SMEs to adopt good manufacturing practices (GMP) included in the revised "Schedule M" of the Drugs and Cosmetics Rules, 1945. The GMP is the global standard of quality and according to the WTO regime came into force from July 01, 2005. As many pharmaceutical SMEs were not able to meet the resource requirement for immediately upgrading their manufacturing facilities to the prescribed standards, the Government had extended the deadline for SMEs from December 31, 2003 to December 31, 2004 and then to June 30, 2005. In the draft National Pharmaceutical policy 2006, the government is intending to start a scheme of 5 per cent interest subsidy on borrowing by pharmaceutical SMEs going for implementation of Schedule M for GMP. It is advisable that this scheme should cover all those SMEs that have taken loan to implement GMP earlier.

In addition to above measures, government has been providing direct incentives for increasing in-house R&D activities of a firm irrespective of size. Any industrial unit receiving recognition from the Department of Scientific & Industrial Research (DSIR) for its in-house R&D centre is provided tax deduction equal to the revenue and capital expenditure spent on R&D and in the case of pharmaceutical industry the allowed deduction is 150 per cent of the research expenses. Recognized pharmaceutical firms are also eligible for duty free import of pharmaceutical reference standards, analytical and specialty equipment for R&D and production.

As most often SMEs do not possess necessary in-house training facilities for their employee in the area of skill development related to adoption of new technology, quality control, entrepreneurship, business and financial management. To address this problem, the Government has established a number of institutes such as National Institute for Entrepreneurship and Small Business Development (NIESBUD) at Noida, National Institute of Small Industry Extension Training (NISIET) at Hyderabad and Indian Institute of Entrepreneurship (IIE) at Guwahati.

These institutes have been developing and undertaking training programmes for small enterprises in the filed of marketing, finance, working capital, business forecasting, business communication, computerization, quality, etc. The National Institute of Pharmaceutical Education and Research (NIPER)—the institute of national importance in the field of pharmaceutical sciences was established in 1988 at Mohali, Punjab and now there are four such additional NIPERs being proposed at Hyderabad, Ahmedabad, Hajipur and Kolkata[38]. These NIPERs should foster strong linkages with pharmaceutical SMEs for research and can be source of excellent training centre for technical skills.

6.3 Internationalization Assistance

The Government of India has taken a set of export promoting measures generally available to exporting Indian firms from all the sectors, besides some specific promotional measures to promote exports from pharmaceutical sectors. Among policies aimed at pharmaceutical industry, the most important was the establishment of an exclusive export promotion council for pharmaceutical products to take up export services and promotional efforts specific to the sector in more rigorous ways in 2004. This was achieved by carving out Pharmexcil (Pharmaceutical Export Promotion Council) from the Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council (Chemexcil)[39]. The Pharmexcil became the nodal agency for granting mandatory Registration-cum-Membership Certificate (RCMC) to Indian pharmaceutical firms desirous of exporting from India. It has started assisting its members by providing trade enquiries received from abroad, organizing trade delegations/buyer-seller meetings at abroad/home, undertaking periodical workshops and interactive meetings on exports related issues, issuing certificate of origin, conveying suitable policy advice related to the emerging problems of pharmaceutical firms to the government.

[38] Hindu Business Line (2007) 'Niper secures 100 acres from IDPL, to invest Rs 180 cr', 30 April.
[39] Economic Times (2004) 'Chemexcil bifurcated to form Pharmaxcil', 22 May.

The Export Promotion Capital Goods (EPCG) Scheme, introduced since 1990, allows exporting firms a concessional customs duty for imports of capital goods. As compared to the early 1990s, the relevance of this scheme has been drastically reduced by early 2000s due to substantial reduction in tariffs on capital goods. An exporter is also given the benefit of replenishing his stocks of inputs (used in exports) by importing the same without payment of customs duty (Duty Free Replenishment Certificate Scheme) and is granted credits, adjustable against payment of customs duty, to neutralize the incidence of basic custom duty on the import content of the exported products (Duty Entitlement Pass Book Scheme). Both the replenishment licenses and duty entitlement pass book are transferable to another exporter. Instead of above two options, an exporter can decide to claim duty drawback (i.e. refund of money to compensate for excise duty paid on the inputs used in the exported products) (Duty Drawback Scheme).

The Ministry of Commerce and Industry has been running a scheme on Marketing Development Assistance (MDA) for exporting firms. Under the MDA scheme, an exporting firm is eligible for financial assistance (travel expenses and/or charges of the built up furnished stall) in participating in export promotion councils led trade delegations/buyer seller meet/trade fairs/exhibitions abroad. To be eligible for MDA, a particular firm's value of exports should be less than or equal to Rs. 15 crore (f.o.b) in the preceding year. Another export promoting scheme known as Market Access Initiatives (MAI) is also available for individual exporting firm. Financial assistance is available to firms in relation to fulfilling statutory requirements in the buyer country including registration charges for product belonging to select priority product groups, hiring of consultants/designers in the prospective/buyer country, and modernizing and upgrading of the identified products as per the needs of the specific markets.

6.4 Areas for Policy Intervention to Promote Exports of Indian Pharmaceutical SMEs

Although the present policy regime has several measures to promote exports of pharmaceutical SMEs, such measures seem to have been implemented unsatisfactorily and the amount of resources committed by the Government is rather inadequate in relation to the existing size of SME sector. This calls for more specific policy initiatives to influence transnationalization behaviour of these small firms. The emphasis of policy should be now on the following areas:

6.4.1 Spreading Awareness of Existing Government Policies

One of the key problems that tend to limit the effectiveness of existing policy supports is the lack of awareness among pharmaceutical SMEs about such Government initiates. Increasing awareness among SMEs about different government policies should be part of a broader effort to facilitate their improvement in technological activities and involvement in international markets. Government agencies covering export councils, banks, technical institutions and industry organizations should develop a specific information dissemination function thorough seminars, workshops, newsletters, short term training programmes, and furnishing information on their web-sites on the existence and accessibility mechanism for various policy incentives available to SMEs.

6.4.2 Ensure Accessibility to National Training and R&D Institutions

The recent policy approach in India has been to encourage and provide financial support to collaborative research between national institutions and firms. The formation of sector-specific R&D funds is meant to encourage sectoral innovation. Notwithstanding the urgent need for adopting such a policy, SMEs usually experience difficulties when accessing national R&D institutions and other supporting institutions due to their proven inadequate networking and accessibility.

On the other hand large firms utilized these policies optimally whereas a large number of SMEs do not benefit from it. Therefore, there is an acute need for developing capabilities of existing institutions to have programmes exclusively for SMEs to promote collaborative research and to help their modernization and upgradation of technological competencies. These institutions should build up relevent technology management programmes appropriate to SMEs' competitive needs and requirements. Furthermore, a specified proportion of pharmaceutical R&D fund should be set aside for supporting SMEs identified according to the present critical limits of investment in plant and machinery.

6.4.3 Provision of Training in Exporting

For encouraging SMEs, especially those without any prior transnational exposure, to adopt export strategy, it is extremely important to provide them with early guidance on the expected costs and benefits of such a strategy with training in the basics of exporting. This should cover the preparatory issues related to exporting and issues involved in actually implementing an export order. Once SMEs are counseled about ways to examine their own firm-specific strengths and weakness with respect to exporting, their knowledge should be expanded on sources of collecting relevant information like list of overseas buyers and products with export potential in specific markets, evaluation procedures to be followed in selecting an appropriate country/buyer and ways to increase familiarity with them, issues to be kept in mind in choosing suitable modes of exporting, considerations for implementing formal export contract with the overseas buyer, special packaging, labeling and marketing requirements, shipment and delivery date, insurance, documentation, arrangement for export finance, etc. The training programmes should be run continuously for exporting SMEs that addresses emerging regulatory issues in specific export markets, changes in market potentials and emerging business opportunities, etc. The provision of this training is particularly useful for SMEs as they usually have scarce in-house capabilities to understand nuances and benefits of exporting and access required information as compared to large enterprises.

6.4.4 Differential Incentive Rates for SMEs

Until now most of the policies relating to R&D incentives and export promotions do not recognize the firm-specific structural heterogeneity associated with firm size and specify a uniform rate of incentives for R&D and export performance across variety of firms in a particular industry. For example, 150 pert cent tax deductions for R&D expenses or the rate of duty drawbacks are same for both SME and large firms. However, given the widespread disadvantages that SMEs faced in doing R&D/exporting than a large firm, it is important to provide them a relatively higher rate of incentives.

6.4.5 Promote Use of IT

Policy attention should also be given to encourage SMEs' adoption of information and technology (IT) as a part of their investment and business strategy. IT capabilities can greatly reduce their business cost by computerization of manufacturing process, efficient database maintenance of information related to buyers order and after sales services and importantly by leading to substantial cutback on the search costs associated with finding and communicating with prospective overseas buyers. IT in the form of website is further a cost- effective way of advertising about the company and its product in the global market. However, Indian pharmaceutical firms including SMEs are laggards among global firms investing in IT. It is estimated that the fixed asset (i.e. cumulative investment) in the form of computers and computer software by pharmaceutical SMEs account for just one per cent of total value of fixed assets in 2000–01 (Pradhan, 2007a). This low level of investment in IT by pharmaceutical SMEs calls for urgent attention. Organizing training programmes related to the use of IT for SMEs and treating investment in IT as eligible for incentive granted to R&D investment are different policy options that can be considered.

6.4.6 Pharmaceutical Clusters

Another relevant policy component for promoting transnationalization has to do with the supports for clustering of pharmaceutical SMEs. When SMEs are suffering from various size-related constrains, clustering—acting together based on a common spatial location—appears to be an effective mechanism for these firms to operate in international markets (Das and Nair, 2004). Pooling of resources for information gathering and sharing, cooperative research efforts, joint marketing and trading activities, etc., certainly help SMEs to do well in the domestic market and to break into export markets with suitable support from Government in initial period. It is advisable to identify different pharmaceutical clusters across different states in India and targeting SMEs to relocate into such clusters for providing required physical and R&D infrastructure.

6.4.7 Poor Infrastructure

Shortage of essential infrastructure like transportation (road, rail, and waterways), power, water, internet connection, banking, etc., constrain the growth and transnationalization of firms in general but their negative effects are more serious for SMEs. Small firms are essentially takers of given relevant infrastructure as they do not own resources to overcome these obstacles by themselves unlike large firms. Beside public investment in such infrastructure supply, promotion of industrial clustering of small firms can certainly help to address this critical issue.

In addition to above areas, the difficulties faced by SMEs in accessing financial resources, improving their managerial capacity, measures to help SMEs to overcome cultural and language barriers, etc., are other aspects to be address by policy measures. Among these, finance continued to be the biggest problem faced by Indian SMEs to grow in domestic and international market as discussed earlier.

6.5 Policy Assistance and Experience of Exporting SMEs

Secondary data often fail to capture many practical difficulties faced by small pharmaceutical firms in undertaking export activities. Therefore, besides using major secondary data sources, we also carried out a primary survey of ten odd small pharmaceutical exporting firms in July 2007 with a set of structured questions pertaining to their exports behaviour. The present section is based on first hand information gathered in the process of interviews during personal visits, telephonic and email interactions with this set of pharmaceutical SMEs. The analysis of survey data will educate us about the nature and magnitude of different constraints these small firms face, while they enter into export market. Moreover, we also enquired whether these firms are availing any government assistance to promote their export activities.

6.5.1 Government Policies: Awareness and Benefits

As mentioned earlier, a number of measures have been taken by the Government to promote exports by Indian pharmaceutical SMEs. To start with, our basic concern has been to examine the general impression that SMEs constitute the least aware group of firms about existing polices as compared with their large counterparts. The rate of awareness, measured as the percentage share of SMEs being aware about a specific government support for exporting to total SMEs, varies from a lowest of 50 per cent to a maximum of 80 per cent on a set of eight major assistances floated by government agencies during last five years to promote exports by SMEs (Table-6.2). It appears that Indian pharmaceutical SMEs are most aware about the establishment of a separate export promotion council for pharmaceutical sector. Tax exemption of export income, MDA and MAI Schemes are also other measures that exporting pharmaceutical SMEs are relatively more aware of.

Table-6.2
Impact of Government Policy on Export Performance

Type of Internationalization Assistance	Rate of Aware-ness (%)	Impact				
		Insignificant /Not-availed	Moderately (-) ve	Highly (-) ve	Moderately (+) ve	Highly (+) ve
Exemption of export earnings from corporate income tax	70.0	42.9	0.0	0.0	42.9	14.3
Market Development Assistance for Exporters (MDA Scheme)	70.0	57.1	0.0	0.0	14.3	28.6
Market Access Initiative MAI Scheme	70.0	71.4	0.0	0.0	28.6	0.0
Duty Drawback Scheme	60.0	50.0	0.0	0.0	16.7	33.3
Duty Exemption Scheme (i.e. advance licenses)	50.0	40.0	0.0	0.0	20.0	40.0
Duty Remission Scheme (i.e. Duty Free Replenishment Certificate Scheme and Duty Entitlement Pass Book Scheme)	50.0	60.0	0.0	0.0	40.0	0.0
Export Promotion of Capital Goods Scheme	60.0	66.7	0.0	0.0	16.7	16.7
Export Promotion Council/ PHARMEXCIL	80.0	50.0	0.0	0.0	12.5	25.0

Source: Based on Survey of 10 Pharmaceutical SMEs

Among the SMEs that are aware about the particular government scheme, quite a significant proportion, often representing majority, is not able to avail those benefits or fail to perceive the beneficial impact of these policies on their export performance. It appears that procedural hurdles, delay, and spending of resources that marked availing process of government scheme may not be commensurable for many SMEs that export small amount of products. In spite of this fact, there are a group of SMEs that have availed government incentives and also benefited from considerable to moderate level of export expansion. For example, a group of two SMEs have availed and greatly benefited from central government's Duty Drawback and Duty Exemption Scheme in terms of a high and significant growth of exports.

6.5.2 Requirement of Different Export Assistance

Several factors play crucial role to expand business into overseas market. For instance, it is important to chalk out an export strategy and to collect necessary information about the perspective destinations where the firm expects to have a profitable export demand for its products. Understanding about the procedure and regulations regarding export both in domestic as well as other countries is equally

important. In each of these areas, SMEs require preliminary support for making a successful entry into export market.

A set of ten types of assistance required for export performance was presented to each respondent SME and were asked to provide a subjective ranking on a scale of 1 to 4 (low requirement to very high requirement of assistance respectively) to each assistance requirement. Table-6.3. and Figure-6.2. summarize the aggregate response of sample SMEs to the different types of export assistance they require from the public agency. The sum of ranking of all SMEs has a possible lower value of 10 (if each SME ranked a particular assistance requirement as low with putting a value of 1) to a maximum value of 40 (if each SME ranked a particular assistance requirement as very high by putting a value of 4).

Table-6.3
Types of Export Assistance Requirement by Pharmaceutical SMEs

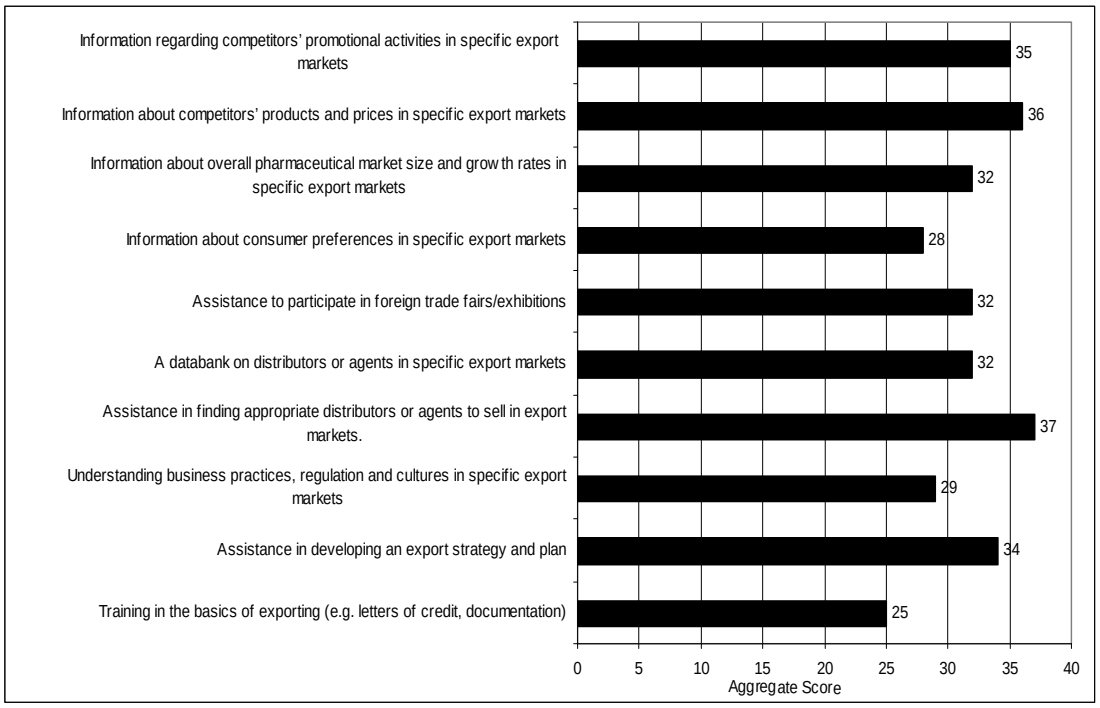
Type of Export Requirement	Sum of Ranking	% of firms reporting of not getting any benefits from government sources (%)
Training in the basics of exporting (e.g. letters of credit, documentation)	25	60.0
Assistance in developing an export strategy and plan	34	100.0
Understanding business practices, regulation and cultures in specific export markets	29	100.0
Assistance in finding appropriate distributors or agents to sell in export markets.	37	80.0
A databank on distributors or agents in specific export markets	32	70.0
Assistance to participate in foreign trade fairs/exhibitions	32	70.0
Information about consumer preferences in specific export markets	28	90.0
Information about overall pharmaceutical market size and growth rates in specific export markets	32	70.0
Information about competitors' products and prices in specific export markets	36	90.0
Information regarding competitors' promotional activities in specific export markets	35	90.0

Source: Based on Survey of 10 Pharmaceutical SMEs

It can be seen that information about the prospective buyers and competitors is the most crucial requirement of SMEs from the Government. They also feel that any help that ensures their access to information on competitors' products and strategies with

respect to pricing and advertising activities in specific export markets is another crucial requirement for their export business. Assistance in developing an export strategy and a readymade and up-to-date databank on overseas buyers are other assistance that SMEs require from policy makers.

Figure-6.2
Aggregate Scoring of Different Export Assistance Requirement



In addition to asking SMEs the importance of different specific export assistance requirement, they were also asked if they had received any assistance from Government with respect to each of these requirements and mentioned the source of assistance such as Pharmaxcil, SIDO (Small Industry Development Organization), SIDBI (Small Industries Development Bank of India), NISIET (National Institute of Small Industry Extension Training), and NSIC (National Small Industries Corporation). Not withstanding, the crucial importance assigned by SMEs to these export assistance, majority of them have grown without any government assistance. In four areas, namely training programmes for basics of exporting (e.g. letters of credit, documentation), opportunity to participate in foreign trade fairs/exhibitions, information on foreign buyers and size of specific export markets, the PHARMEXCIL has been increasingly playing a positive role to the benefit of Indian pharmaceutical SMEs. However, most of the surveyed firms complained that these training are not

regular and just confined to a few selected cities and prepared databank/directories on distributors/agents or prospective buyers are not regularly updated.

6.5.3 Constraints of Export Efforts

Among the major problems that constraint export by Indian pharmaceutical SMEs shortage of low cost finance to meet the expenses towards exporting and inadequate policy support to receive approvals from overseas regulatory authorities emerged as the two most important areas of concern (Table-6.4.). It is natural that a resource-constraint small firm without access to cheap capital may not be able to undertake the whole range of expenses that export entails like conducting market studies, identifying and communicating with overseas buyers, high transport and packaging cost, product registration and approval from overseas authorities, etc.

Indian SMEs also seem to be discouraged from exporting due to lack of information services on overseas markets and potential buyers, insufficient access to laboratory testing facilities and inadequate tax concessions and other incentives.

Table-6.4
Constraints of Export Efforts by Pharmaceutical SMEs

Types of Constraints	% of Firms Reporting the listed Problems as		
	Very Significant	Moderately Significant	Not a Problem
Documentation and approval procedural hurdles in export marketing	70.0	30.0	0.0
Lack of information services on overseas markets and potential buyers	80.0	20.0	0.0
Lack of access to low costs finance for exports	90.0	10.0	0.0
Inadequate tax concessions and other incentives for exports	80.0	20.0	0.0
Inadequate government assistance/incentives for getting approvals of overseas regulatory bodies like USFDA	90.0	10.0	0.0
Higher transport costs	80.0	10.0	10.0
Limited Managerial Resources	70.0	10.0	20.0
Inadequate In-house R&D investment	70.0	30.0	0.0
Insufficient access to laboratory testing facilities	80.0	10.0	10.0

Source: Based on Survey of 10 Pharmaceutical SMEs

6.5.4 Areas of Policy Interventions Suggested by Surveyed SMEs

The surveyed SMEs were also encouraged to suggest policy support measures that they think would be helpful for their companies' export activities. Most of these SMEs are unanimous in their suggestions that effective steps should be taken to ensure access to cost effective laboratory/clinical testing facilities and evolving a standardized documentation procedure for quality control for compound formulations involving safety data sheet, efficacy data, etc. Those SMEs dealing in herbal products suggested that most crucial problem that inhibits their exports is absence of global recognition of Aurdeva as a system of treatment. It is strongly suggested that Government of India must take up this issue at bilateral and multilateral levels among various countries to give due recognition to Ayurveda in their healthcare system. Efforts should be made to ensure representation of Aurvedic experts in technical committees of international organizations like WHO and national agencies and to make Indian pharmacopoeia and standard monographs acceptable by other countries. Internally, the government should take necessary steps to increase clinical testing facilities for Ayurvedic products including enhancing technical know-how on microbial and other contamination testing, introducing uniformity in Ayurveda educational curriculum, and instituting necessary changes in the Indian Drugs and Cosmetics Act to fit Ayurvedic medicines with the ways of the world.

Many SMEs also mentioned that Government support to upgrade manufacturing facilities to GMP has not been timely and the provision of low cost finance for this purpose has been recently mentioned in the draft of the forthcoming pharmaceutical policy. They perceived that access to low cost finance (i.e. lower rate of interest) for upgrading plants to meet international standard has been a major factor upsetting their export plans. These SMEs were also expressively worried about the negative impact that a non-stable exchange rate regime can have on their export performance. As Indian rupee is on the course of a consistent rise vis-à-vis the US dollar in recent times, SMEs are quite serious about its impact.

According to the surveyed Pharmaceutical SMEs, their exporting has been obstructed by a wave of new and emerging protectionism in several importing countries from developed to developing regions. This concern of exporting SMEs has been clearly verified by several newspaper reports that documented rising incident of tariff and non-tariff barriers against Indian pharmaceutical exporters in a host of countries such as Brazil, Mexico, China and Germany[40]. Raising import duties from a nominal level to a very high level, insisting on different types of plant approval procedures, charging prohibitive product registration fee, etc., have been the tools employed in these countries. Recently, European Union stipulated that herbal drugs exporters into its region should provide 30 years safe usage data and provide for blacklisting for the presence of heavy metals in the exported medicines[41]. This problem can be resolved if India will evolve an official system that certifies or guarantees the quality of the export consignment and take steps to ensure its acceptance by other countries as mentioned earlier.

SMEs exporters were also found to have limited expertise to deal with intellectual property right (IPR) issues involved in exporting to different markets and have argued for a supportive mechanism. The establishment of an Intellectual Property Rights (IPR) centre under Pharmexcil in May 2007 to take care of this aspect of exporting by SMEs has been a very timely measure, which would greatly benefit these small firms[42].

40 Business Standard (2007) 'Export barriers hit pharma firms', 16 August.
41 Business Standard (2007) 'EU stipulation a hurdle for herbal exports', 21 August.
42 Hindu Business Line (2007) 'Pharmexcil setting up IPR centre for small scale sector', 03 May.

Chapter VII

CONCLUSIONS AND RECOMMENDATIONS

Over more than four decades in the past, the SME sector in India has functioned under the umbrella of protection and reservation but with economic liberalization since 1990s, it is facing increasing national as well as international competition. The nature and magnitude of competition is even more acute for technology-intensive SMEs like pharmaceuticals. The present study, based on a mixture of both primary and secondary data seeks to assess the constraints being faced by pharmaceutical SMEs especially those in respect of their transnationalization efforts. The primary objective of the study is to assess the effectiveness of the existing policies and programmes to address factors inhibiting SME's process of internationalization and suggest possible improvements to frame a more enlightened and well-grounded policy making.

To begin with, different possible transnationalization modes in the case of pharmaceutical SMEs were explored with particular emphasis on exports and outward FDI. A brief review of various theories dealing with exports and outward FDI was undertaken to identify possible factors that lead to the transnationalization of firms in general. Theoretical approach to the transnationalization of firms suggests that the necessary condition for exports and outward FDI is that firms must possess a set of monopolistic advantages based on firm-specific tangible and intangible assets. As small firms relatively possess these advantages in smaller magnitude when compared to their large counterparts, their processes of transnationalization are not smooth and require facilitating support from the public authority. Resource constraint SMEs, not only seek a strategic help from Government in strengthening their technological and skill base by training and R&D support, but also require preliminary help in foraying into international markets by the provision of market information including readily available list of overseas buyers, help in securing overseas product registration and plant approvals, etc.

The available estimates on Indian pharmaceutical SMEs indicate that they constitute the backbone of Indian pharmaceutical sector in terms of number of units and employment contribution. Although they had contributed only one-fourth of value added of the total pharmaceutical sector, their role in providing accessible essential drugs in India has been admirable. However, these SMEs are being increasingly exposed to a different kind of competitive scenario unlike in the past. As a result of policy liberalization, they have to meet a globalized competition largely driven by innovation of product and advertising. Therefore, it is expected that Indian pharmaceutical SMEs need to push up their technological activities, adopt aggressive product differentiation strategy, and go for skill improvement.

However, the statistical information available suggests that as compared to large firms, small firms are far behind in terms of many performance indicators even in the liberalized phase. For instance, these firms are not capable of undertaking adequate technological and marketing activities to compete with domestic large as well as foreign firms. They are also not able to enhance their export activities as a medium of enlarging their market focus. Indian pharmaceutical SMEs have witnessed a decline in export share in recent years as compared to large firms, a sign for major cause of worry. The export intensity of these firms has also declined in post-liberalized period (2001–02) as compared to pre-liberalized phase (1976–77).

In order to understand export behaviour of pharmaceutical SMEs more adequately, it is important to know a group of key causal variables that significant affect their export behaviour. Drawing upon the past theoretical and empirical literature in the tradition of Neo-technology theories of trade (Posner 1961; Venon, 1966) an empirical framework was developed for Indian pharmaceutical SMEs. The study has used two semiparametric censored regression estimators namely Symmetrically Censored Least Squares (SCLS) and Censored Least Absolute Deviations (CLAD) to address the problem of inconsistencies that marked the often used techniques of Maximum Likelihood Tobit estimation, when the error term fails to meet classical assumptions. The empirical analysis clearly brings out that in-house R & D capability is one of the important factors to promote transnationalization through export activities. Import of

capital goods and machineries also play a crucial role to gain a niche in the export market. Government fiscal incentives have been found to be more export promoting in the case of pharmaceutical SMEs. As the size is positively correlated with the export performance, this implies that size disadvantage is a crucial obstacle for the transnationalization of small firms.

The case studies of selected pharmaceutical SMEs bring out more clearly the different strategies that these firms are adopting with respect to transnationalization. A few pertinent lessons for other firms can be drawn from these case studies. First, it is possible for a particular SME to successfully enter into export market merely by improving quality of product and manufacturing process. However, quality alone does not ensure a secured market share in the long run. Second, those SMEs who have adopted both innovation and quality improvement as competitive tools have been relatively more successful in expanding their presence in the export markets. Third, besides these two strategies, SMEs have also employed the route of strategic alliances, collaborative research programmes with government and other institutions, adoption of outward investment, etc., indicating that competitive strategies of these firms are getting more complex and sophisticated. Fourth, in spite of a firm adopting all the above strategies may not succeed simply because of lack of transparent governance, poor management and adoption of corrupt practices.

Although pharmaceutical SMEs seem to have a great potential of transnationalization through outward FDI, due to limited financial and technological capabilities many small firms fail to undertake more profitable forms of OFDI such as manufacturing in host countries thorough joint venture with local partners or through wholly-owned subsidiary. Limited OFDI statistics clearly reveals that *manufacturing OFDI* is the most preferred mode of outward investment and their destinations are developed countries like USA and Germany. The experience of selected SME suggests that OFDI has helped in improving and enhancing their overall competitiveness in the global market.

The study has led to the following suggestions for a more realistic policy aimed at promoting transnationalization of Indian pharmaceutical policies:

1. Ensure adequate and low cost finance to SMEs for upgrading plants including GMP implementation, technology and getting approvals from overseas regulatory authorities;
2. Strengthen access to national research laboratories, Training Institutes and adequate facilities for testing laboratories for Indian pharmaceutical SMEs;
3. Allocate more resources towards MDA and MAI schemes for Indian pharmaceutical SMEs;
4. Maintain and regular update an online database on overseas distributors/buyers and provide access to SMEs at without any or at modest charges;
5. Organize regular awareness programmes on different government incentives through workshops at regional or local levels;
6. Organize training programmes to enhance SMEs' understanding of basics of exporting strategy, procedures, and requirements of different overseas markets;
7. Formulate discriminatory rate of incentives for export performance to SMEs than large firms;
8. Promote small firms to link with large domestic as well as foreign firms to enhance outsourcing and job works;
9. Encourage the use of information technology by SMEs;
10. Promote pharmaceutical SMEs clusters;
11. Invest more in improving physical infrastructure, including road transport, ports;
12. Take Efforts to establish global recognition for *Ayurveda* as an alternative system of health care;
13. Address the rising issues of protectionism in different export markets through bilateral and multilateral trade negotiations.

Recommendation for a Research Programme

In view of the above broad conclusions, this study would like to suggest that a research programme may be adopted jointly by various government authorities functioning in various dimensions affecting the performance of the SME sector. The government agencies like the Department of Scientific and Industrial Research (DSIR) have been playing a significant role in encouraging industrial innovation in India since late 1980s. As technology in various forms like new product, new process and new management system constitutes the starting point for transnationalization of firms, the role of DSIR and other relevant agencies are crucial in promoting Indian firms' export activities. The study proposes a concrete work programme that DSIR and such other public entities together can undertake to strengthen transnationalization of Indian SMEs including those from the pharmaceutical sector. The main objective of the research programme is to create institutional capabilities on various aspects of exporting and to provide continuous technical support to SMEs through regular training and special workshops.

• Experts Network on SME Export

This will include establishing a Network of Experts and Institutions drawn from various relevant areas concerning export activities like export financing, insurance coverage, packaging, product registration, IPR management, shipment, etc. The box below provides an illustrative list of experts with required skills who can be part of the expert network.

Experts	Skill Required
Policy Makers dealing with SSI sectors/export activities	- To disseminate information on various available government incentives for exporting by SMEs
CEOs of actual exporting SMEs	- To discuss various practical measures needed for actual exporting by SMEs
Financing Expert (Banks, consultancy organization, etc.)	- To discuss various means of arranging finances for undertaking export activities
Experts on Basics of Exporting (Individuals, institutions like IIFT, IIMs, other management institutions, etc.)	- To discuss various assessment stages of developing an export strategy; - How to identify a potential export market/potential overseas distributors and how to obtain accurate information; - Product registration; - IPR components of products to be exported; etc.

• Institutional Capacity Building and Training

This will include developing a training curriculum in exporting for SMEs. The selected experts will be drawn from the established Network who will harness the capability of SMEs in undertaking exporting by addressing various practical issues faced by them.

The government agency that is mooting this research programme may think of conducting these training programmes for SMEs by deputing instructors to various part of India, where pharmaceutical SMEs are located. Special training programmes may also be arranged for workers not only to make them aware of the changing business environment, but also to enhance their technical skills. These training programmes would also serve as a useful means of making many small firms aware of existing government supports for undertaking export activities. The government agencies may also think of collaborating with industry bodies like IDMA, PHARMAEXCIL, All India Small Scale Drug Manufacturers Association, Bulk Drug Manufacturers Association, etc., who can be part of the experts network and who can be instrumental in promoting their members to join the training programme. These industry bodies are also organizing different workshops on exporting and they may be happy to share resource burden with the concerned government body for developing a comprehensive and continuous training programme for their members. Apart from these initiatives different research papers on the latest aspects of technology management, exports, product development, business conditions, etc., can be brought out by various experts as working papers and should be put on the agencies' websites and be printed as reference material for SMEs.

Since exporting is a dynamic process, continuous dialogues among different stake holders like experts and SMEs will provide an effective platform to present timely policy issues to policy makers dealing with the SME sector development.

Annexure 1

List of Small and Medium Pharmaceutical Firms Included in the Present Study

Sl. No.	Company Name	Year/Month	(In Rs. Crore)				Size of the Firm
			Total sales	Gross Fixed Asset	Plant & Machinery	Exports	
1	A B L Biotechnologies Ltd.	200503	6.78	3.68	1.07	0	Small
2	Aarey Drugs & Pharmaceuticals Ltd.	200503	1.72	3.88	1.92	0	Small
3	Add-Life Pharma Ltd.	200203	0.46	2.7	2	0	Small
4	Adinath Bio-Labs Ltd.	200503	19.91	4.6	0.63	0	Small
5	Advik Laboratories Ltd.	200503	6.32	9.12	4.82	0	Small
6	Agio Pharmaceuticals Ltd.	200403	36.56	1.4	0.31	35.51	Small
7	Anmol Drugs & Pharmaceuticals Ltd.	200303	0.05	3.94	0.4	0	Small
8	Anuh Pharma Ltd.	200503	53.96	5.54	1.3	25.71	Small
9	Auro Laboratories Ltd.	200503	2.76	4.47	1.77	1.3	Small
10	Avinash Drugs Ltd.	200503	0.11	3.69	2.66	0	Small
11	Bal Pharma Ltd.	200503	57.99	25.12	4.68	11.58	Small
12	Beryl Drugs Ltd.	200403	7.99	5.13	2.93	0	Small
13	Bharat Parenterals Ltd.	200303	10.02	4.77	2.38	0	Small
14	Biddle Sawyer Ltd.	200412	35.19	1.99	1.67	0	Small
15	Biochemical & Synthetic Products Ltd.	200503	8.8	3.07	1.72	0	Small
16	Biofil Chemicals & Pharmaceuticals Ltd.	200503	1.16	4	0.4	0	Small
17	Blue Cross Laboratories Ltd.	200503	130.73	53.5	3.32	8.5	Small
18	Burroughs Wellcome (India) Ltd. [Merged]	200312	206.66	12.09	2.04	0	Small
19	Caplin Point Laboratories Ltd.	200403	8.37	6.71	3.68	0	Small
20	Ceejay Tobacco Ltd.	200503	69.77	0.71	0	0	Small
21	Chemech Laboratories Ltd.	200403	2.57	5.93	3.14	0.6	Small
22	Chemo-Pharma Laboratories Ltd.	199903	0.09	3.62	2.42	0	Small
23	Chiplun Fine Chemicals Ltd.	200403	3.1	5.3	3.64	0.28	Small
24	Colinz Laboratories Ltd.	200503	6.33	4.11	1.01	0	Small
25	Concord Drugs Ltd.	200503	2.03	3.1	1.17	0.01	Small
26	Croydon Chemical Works Ltd. [Merged]	200112	6.44	1.13	0.63	0	Small
27	Denis Chem Lab Ltd.	200503	15.13	6.34	3.8	0	Small
28	Dental Products Of India Ltd.	200503	8.33	1.02	0.42	0.48	Small
29	Desh Rakshak Aushdhalaya Ltd.	200503	1.82	4.48	1.87	0	Small
30	Dr. Sabharwal'S Manufacturing Labs Ltd.	200403	5.86	2.38	1.02	1.72	Small
31	Dr. Wellmans Homoeopathic Laboratory Ltd.	200303	0.36	2.6	0.55	0	Small
32	Ebers Pharmaceuticals Ltd.	200103	0.34	3.02	0.48	0	Small

Sl. No.	Company Name	Year/Month	(In Rs. Crore)				Size of the Firm
			Total sales	Gross Fixed Asset	Plant & Machinery	Exports	
33	Elder Health Care Ltd.	200503	23.01	6.11	2.99	0	Small
34	Elder Projects Ltd.	200203	20.63	7.71	3.68	0	Small
35	Endolabs Ltd.	200103	6.72	4.16	1.79	0	Small
36	Esskay Pharmaceuticals Ltd.	200203	1.91	5.7	2.31	0	Small
37	Fredun Pharmaceuticals Ltd.	200503	9.34	6.63	3.04	5.48	Small
38	Fulford (India) Ltd.	200412	131.79	7.4	1.53	0	Small
39	Geoffrey Manners & Co. Ltd. [Merged]	200203	156.94	6.22	4.54	0.11	Small
40	Gujarat Terce Laboratories Ltd.	200503	7.26	3.21	1.18	0.79	Small
41	Haffkine Ajintha Pharmaceuticals Ltd.	200403	7.4	2.49	0.99	0	Small
42	Haffkine Bio-Pharmaceutical Corpn. Ltd.	200403	30.83	22.41	2.72	0.01	Small
43	Harleystreet Pharmaceuticals Ltd.	200403	3.41	3.36	2.34	0	Small
44	Hester Pharmaceuticals Ltd.	200503	16.23	6.59	3.75	0.18	Small
45	Hulta Pharmaceutical Export Ltd.	200403	0.02	3.09	2.46	0	Small
46	Indo-American Advanced Pharmaceuticals Ltd.	200103	0.67	1.42	0.29	0	Small
47	Inwinex Pharmaceuticals Ltd.	200503	20.86	3.72	1.8	0	Small
48	Ishita Drugs & Inds. Ltd.	200503	2.07	2.76	1.61	0.35	Small
49	Ivee Injectaa Ltd.	200203	1.25	2.31	1.1	0	Small
50	Jenburkt Pharmaceuticals Ltd.	200503	26.11	7.37	3.65	0.77	Small
51	Kamron Laboratories Ltd.	200503	5.69	6.17	2.91	0	Small
52	Kappac Pharma Ltd.	200503	3.52	2.23	0.83	0	Small
53	Kilitch Drugs (India) Ltd.	200503	26.32	13.46	3.66	2.89	Small
54	Lekar Pharma Ltd.	200503	18.86	2.32	1.04	0	Small
55	Leopard Investments Ltd.	200403	3.07	4.8	1.64	0	Small
56	Makers Laboratories Ltd.	200503	42.92	10.75	3.98	0	Small
57	Mercury Laboratories Ltd.	200503	13.46	3.92	1.59	2.09	Small
58	Monozyme India Ltd.	200503	9.82	1.75	0.91	0.06	Small
59	N B Z Pharma Ltd.	200403	44.81	4.41	2.26	0	Small
60	N G L Fine-Chem Ltd.	200503	10.33	5.85	2.84	9.88	Small
61	Nalin Chemicals Ltd.	200003	0.01	3.31	2.43	0	Small
62	Ortin Laboratories Ltd.	200303	3.57	3.18	1.23	0	Small
63	Ozone Pharmaceuticals Ltd.	200403	40.43	9.3	3.34	0	Small
64	Perk Pharmaceuticals Ltd.	200503	1.06	4.49	2.34	0	Small
65	Phaarmasia Ltd.	200503	16.17	12.07	1.78	0	Small
66	Pharmaids Pharmaceuticals Ltd.	200503	0.46	1.98	1.14	0	Small
67	Principal Pharmaceuticals & Chemicals Ltd.	200503	0.17	6.44	4.32	0	Small
68	Proto Infosys Ltd.	200203	0.06	2.67	0.75	0	Small
69	Rekvina Laboratories Ltd.	200303	0.91	0.58	0.26	0.48	Small
70	Roopa Industries Ltd.	200503	8.4	6.84	4.32	0.27	Small

Sl. No.	Company Name	Year/Month	(In Rs. Crore)				Size of the Firm
			Total sales	Gross Fixed Asset	Plant & Machinery	Exports	
71	Rubra Medicaments Ltd.	200503	0.86	4.55	0.4	0	Small
72	Saket Projects Ltd.	200303	3.23	6.89	3.52	0	Small
73	Samrat Pharmachem Ltd.	200503	20.54	1.4	0.84	0	Small
74	Sandu Pharmaceuticals Ltd.	200503	8.3	9.01	2.94	0	Small
75	Sanofi-Synthelabo (India) Ltd.	200403	60.83	2.47	1.08	0	Small
76	Sarabhai Zydus Animal Health Ltd.	200503	70.94	1.13	0.54	0	Small
77	Shaba Chemicals Ltd.	200003	0.01	1.37	1.13	0	Small
78	Sharon Bio-Medicine Ltd.	200406	23.66	8.66	3.29	4.21	Small
79	Shilpax Laboratories Ltd.	199703	30.37	7.31	3.14	0	Small
80	Shree Dhootapapeshwar Ltd.	200503	10.9	3.99	1.32	0	Small
81	Sigachi Laboratories Ltd.	200503	0.33	3.6	1.45	0	Small
82	Solus Pharmaceuticals Ltd.	200312	3.05	0.39	0.26	0	Small
83	Solvay Pharma India Ltd.	200412	127.73	4.34	1.71	0	Small
84	Supriya Pharmaceuticals Ltd.	200209	14.78	5.57	3.98	0	Small
85	Swas Health Products Ltd.	200403	1.48	0.51	0.49	0	Small
86	Sword & Shield Pharma Ltd.	200403	2.66	3.2	2.17	0	Small
87	Tablets (India) Ltd.	200403	78.44	16.57	2.58	2.81	Small
88	Trans Medicare Ltd.	200003	0.05	4.09	1.37	0	Small
89	Triochem Products Ltd.	200503	0.23	2.02	1.01	0.09	Small
90	Twilight Litaka Pharma Ltd.	200503	75.5	28.65	3.64	3.76	Small
91	Unibios Laboratories Ltd.	200403	26.8	6.65	3.81	12.52	Small
92	Unjha Formulations Ltd.	200503	6.93	2.61	1.07	1.68	Small
93	Venkat Pharma Ltd.	200503	36.42	3.71	2.61	32.89	Small
94	Venus Remedies Ltd.	200503	34.09	14.75	3	0	Small
95	Veronica Laboratories Ltd.	200303	28.43	2.1	0.59	0	Small
96	Vikram Thermo (India) Ltd.	200503	11.56	6.62	4.52	1.38	Small
97	Vysali Pharmaceuticals Ltd.	200503	7.44	7.53	2.85	1.62	Small
98	Welcure Drugs & Pharmaceuticals Ltd.	200403	17.07	8.98	3.32	0	Small
99	Wockhardt Biopharm Ltd.	200412	0.48	4.31	4.05	0	Small
100	Yenkey Drugs & Pharmaceuticals Ltd.	200303	1.34	4.82	3.8	0	Small
101	Zenith Health Care Ltd.	200503	3.21	2.5	1.08	0	Small
102	Zenotech Laboratories Ltd.	200303	0.11	0.03	0.02	0	Small
103	Zuventus Healthcare Ltd.	200403	61.63	1.03	0.32	0	Small
104	Zyden Gentec Ltd.	200503	0.28	0.7	0.31	0.06	Small
105	Zydus Pathline Ltd. [Merged]	200103	3.1	0	0	0	Small
106	Apex Laboratories Ltd.	200403	53.69	12.39	6.21	0	Medium
107	B D H Industries Ltd.	200503	25.44	17.97	6.1	16.97	Medium
108	Bajaj Consumer Care Ltd.	200503	91.94	20.19	5.09	0.37	Medium
109	Bombay Drugs & Pharmas Ltd. [Merged]	200103	11.48	9.22	6.17	10.17	Medium
110	Chemcaps Ltd.	200303	5.62	6.98	6.15	1.5	Medium
111	Coral Laboratories Ltd.	200503	16.9	11.19	5.57	1.18	Medium
112	D I L Ltd.	200403	20.23	12.11	5.39	8.73	Medium

Sl. No.	Company Name	Year/Month	(In Rs. Crore)				Size of the Firm
			Total sales	Gross Fixed Asset	Plant & Machinery	Exports	
113	Dolphin Laboratories Ltd.	200103	14.28	17.92	7.35	5.37	Medium
114	Emergy Phaarma Ltd.	199709	0.2	7.54	5.26	0	Medium
115	Eupharma Laboratories Ltd.	200203	3.69	23.55	6.79	0.25	Medium
116	Fermenta Biotech Ltd.	200503	14.6	13.87	9.49	7.08	Medium
117	Fine Drugs & Chemicals Ltd. [Merged]	200303	6.18	12.65	8.29	0	Medium
118	Group Pharmaceuticals Ltd.	200503	32.69	14.3	6.2	0	Medium
119	Gufic Biosciences Ltd.	200503	56.03	13.97	9.75	9	Medium
120	Gujarat Inject (Kerala) Ltd.	200206	1.17	10.81	8.7	0	Medium
121	Icon Biopharma & Healthcare Ltd.	200103	32.65	9.73	5.78	0	Medium
122	Indosol Drugs Ltd.	200403	12.6	11.82	6.79	2.24	Medium
123	Ind-Swift Ltd.	200503	249.48	54.67	8.02	1.07	Medium
124	Jagsonpal Pharmaceuticals Ltd.	200503	148.01	40.91	8.68	3.58	Medium
125	Konar Organics Ltd.	200503	0.71	7.07	5.02	0	Medium
126	Laurel Organics Ltd.	200203	1.15	8.24	5.25	0	Medium
127	Lincoln Pharmaceuticals Ltd.	200503	37.9	11.74	5.8	7.09	Medium
128	Medicamen Biotech Ltd.	200503	48.11	12.58	5.55	37.88	Medium
129	Neon Laboratories Ltd.	200403	50.4	13.28	6.95	1.61	Medium
130	Organon (India) Ltd.	200412	160.66	17.16	5.2	13.35	Medium
131	P I Drugs & Pharmaceuticals Ltd.	200503	25.59	12.18	5.95	7.79	Medium
132	Pan Drugs Ltd.	200303	21.91	7.91	5.53	2.68	Medium
133	Paras Pharmaceuticals Ltd.	200503	202.08	28.05	7.1	11.22	Medium
134	Pharmacia Healthcare Ltd. [Merged]	200311	36.24	22.93	7.92	0	Medium
135	Pharmax Corporation Ltd.	200503	4.32	14.05	6.77	0	Medium
136	Rusan Pharma Ltd.	200403	28.73	16.85	9.12	19.03	Medium
137	Sanjivani Paranteral Ltd.	200503	30.77	11.25	7.4	0	Medium
138	Span Diagnostics Ltd.	200503	41.62	18.44	5.95	3.91	Medium
139	Sri Krishna Drugs Ltd.	200203	18.41	13.25	8.26	11.53	Medium
140	Suyash Laboratories Ltd.	200403	30.09	10.05	7.34	0	Medium
141	Synbiotics Ltd.	200503	20.24	10.41	8.63	0	Medium
142	Tonira Pharma Ltd.	200503	23.23	32.01	9.95	20.28	Medium
143	Uni-Sankyo Ltd.	200503	29.17	14.7	7.39	0.33	Medium
144	Vista Pharmaceuticals Ltd.	199603	0.43	8.84	6.51	0.07	Medium

Source: Prowess Database, 2007.

Annexure 2

Innovation Driving Exports: The Case of Tonira, Fermenta Biotech, N G L Fine-Chem, and Bal Pharma Limited

Tonira Pharma Limited[43]: This is a highly export-oriented medium-sized Indian pharmaceutical company that has been reaping benefits of a conscious innovation strategy adopted by it. During 2001–2006, the company exported about as high as 78.6 per cent of its sales to over 40 countries (Annexure Table-1). The company has been scaling up its capability in manufacturing practices, in-house research strength, and improvement in product quality. The company has adopted the WHO-GMP practices in its manufacturing plant at Ankleshwar (Gujarat) and its recently commissioned manufacturing plant at Vadodara (Gujarat) is designed according to the cGMP—the USFDA standards for manufacturing. The company has established a regulatory department to ensure strict compliance in manufacture, quality and documentation. The company has a well developed in-house innovation centre that concentrates on the development of cost-effective and patentable processes, Chiral drugs, and processes validation. This centre also has pilot plant to carry out the transformation of laboratory processes into industrial manufacturing processes. The company has a collaborative research alliance with National Chemical Laboratory, Pune, for instrumental analysis and information updates on technological development. The R&D intensity of the company has gone up from just 1 per cent in 2002 to 10 per cent in 2005 and is about 3.3 per cent for the complete period 2002–2006. This innovation strategy has resulted in five patents that the company holds in countries like India, Europe, Japan, and USA. Innovation in turn has improved its competitiveness in the world market. The Chairmen of the company in the Annual Report 2003–2004 stated the role of innovation and quality as follows:

> "Tonira has continued to pledge itself to bring excellence through focusing on vast global markets by improving value additions by launching new research and development based products, through rationalizing product portfolio (product mix), by minimizing operating risk through specific product cost control, with total quality management practices across the organization and by minimizing financial risk, correspondingly".

Annexure Table-1
Export and R&D Activities of Tonira Pharma Limited

Variables	Mar 2001	Mar 2002	Mar 2003	Mar 2004	Mar 2005	Mar 2006	All Years
Sales (Rs. Crore)	16.34	22.48	27.05	28.21	23.23	30.35	147.66
Export (Rs. Crore)	10.5	15.42	21.28	22.25	20.28	26.33	116.06
R&D (Rs. Crore)		0.24	0.55	0.93	2.34	0.82	4.88
(In Per cent)							
Export intensity	64.3	68.6	78.7	78.9	87.3	86.8	78.6
R&D intensity		1.1	2.0	3.3	10.1	2.7	3.3

Source: Prowess Database, 2007.

Fermenta Biotech Limited: Fermenta is another medium-sized firm in the Indian pharmaceutical industry that has achieved a rapid export growth in the first half of 2010

[43] Largely based on information collected from the company's website: http://www.tonira.com/

because of a strategic R&D focus and continuous process monitoring. The company has spent about 9 per cent of its sales in undertaking in-house R&D activities during 2000–2006 (Annexure Table-2). Over the years the company has developed its core competencies around the world class product quality ensured by cGMP compliant manufacturing facilities, scaling up of in-house R&D efforts and collaborative research with laboratories in India and Europe. Development of improved and novel enzyme catalysts, novel Penicillin G amidase, and reactive beaded polymer supports for binding various high value enzymes are results of company's focused research efforts. To sustain and enlarge its export activities the company is already in the processes of upgrading its manufacturing facilities to comply with EU- GMP norms.

Annexure Table-2
Export and R&D Activities of Fermenta Biotech Limited

Variables	**Mar 2000**	**Mar 2001**	**Mar 2003**	**Mar 2004**	**Mar 2005**	**Mar 2006**	**All Years**
Sales (Rs. Crore)	16.48	22.98	8.58	6.79	14.6	28.65	98.08
Export (Rs. Crore)	2.34	6.26	4.47	3	7.08	17.34	40.49
R&D (Rs. Crore)	2.6	2.02	0.52	0.83	2.23	0.72	8.92
(In Per cent)							
Export intensity	14.2	27.2	52.1	44.2	48.5	60.5	41.3
R&D intensity	15.8	8.8	6.1	12.2	15.3	2.5	9.1

Source: Prowess Database, 2007.

N G L Fine-Chem Limited: Primarily, N G L Fine-Chem is a small-sized company engaged in manufacturing and export of a narrow range of products related to the veterinary segment like Diminazene Aceturate, Diminazene Diaceturate, Homidium Chloride, Nitroxynil, Clorsulon, Homidium Bromide, Parvaquone, Carprofen, Clopidogrel Hydrogen sulfate, Nitazoxanide, etc. Although small in size, the company has been able to improve its export performance mainly because of innovation in process and quality. Competitive prices, adherence to delivery schedules, international quality standards and constant technological improvement are the main competitive tools of the company to establish its position in the global market through outsourcing to global pharmaceutical companies and exports to global customers. Exports constituted about as high as 70 per cent of company's sales during 2000–2006 (Annexure Table-3). Presently Africa is the main export market but the company is trying to diversify its export destination into more regions by improving R&D capabilities. During 2002-2006, company devoted about 2.2 per cent of sales for its in-house R&D activities. The company has been certified as ISO 9001:2000 compliant by SGS UK and its manufacturing facility at Tarapur is cGMP certified. The web site of the company summed up the innovation strategy of the company as: "N G L Fine-Chem Ltd has a strong focus on developing intellectual property as a key differentiator and as a platform for further growth up the pharma value chain. We respect intellectual property and invest in developing it as a key growth driver for the future[44]."

Annexure Table-3
Export and R&D Activities of N G L Fine-Chem Limited

Variables	Mar 2001	Mar 2002	Mar 2003	Mar 2004	Mar 2005	Mar 2006	All Years
Sales (Rs. Crore)	1.31	0.94	1.45	3.69	10.33	12.12	29.84
Export (Rs. Crore)	0.2	0	0.14	1.94	9.88	8.71	20.87

[44] http://www.nglfinechem.com/profile.htm

R&D (Rs. Crore)			0.05	0.13	0.3	0.18	0.66
(In Per cent)							
Export intensity	15.3	0.0	9.7	52.6	95.6	71.9	69.9
R&D intensity			3.4	3.5	2.9	1.5	2.2

Source: Prowess Database, 2007.

Bal Pharma Limited: It is also a small pharmaceutical company that is engaged in export activities. The company has exported about 23 per cent of its sales over 2001–2006 (Annexure Table-4). Unlike N G L Fine-Chem, it has a well diversified products portfolios and its export basket reflect that. There are about 96 products in its export basket—17 brands, 4 anti-diabetics, 6 vitamins, 13 broad spectrum topical anti-microbial, 8 anti-tubercular drugs, 6 anthelminthics and anti-Protozoals, 14 new formulations, 2 sedative/hypnotic/tranquilizers, 14 analgesic/antipyretic/anticold, 3 antiallergics/liver stimulants, 1 anti-malarias, and 8 large volume parenterals[45]. These exported products originated from company's three WHO-GMP compliant manufacturing units specialized on formulations, bulk drugs and intermediates, and IV fluids and opthalmic solutions. The company has been ISO 9001 certified by ANSI-RAB & KPMG, USA. Therefore, the company has adopted stringent quality assurance procedure for its entire product range so as to meet competitive challenges in the world market. Apart from quality, R&D efforts have been a key growth strategy of the company. The company has been spending about 1.5 per cent of its sales in R&D activities over 2001–2006 mainly directed at development of new molecules, formulations, process and quality improvements. These R&D activities led to the introduction of products such as Levobunolol (Antiglaucoma), Tolterodine Tartrate (Adult urinary incontinence) and Letrozole (Anticancer). In short, 'technology and innovation are the integral components of Bal Pharma's competitive position' recently[46].

Annexure Table-4
Export and R&D Activities of Bal Pharma Limited

Variables	Mar 2001	Mar 2002	Mar 2003	Mar 2004	Mar 2005	Mar 2006	All Years
Sales (Rs. Crore)	37.71	44.09	55.14	60.7	57.99	74.62	330.25
Export (Rs. Crore)	8.05	9.28	15	16.15	11.58	17.04	77.1
R&D (Rs. Crore)	0.24	0.55		1.47	1.22	1.43	4.91
(In Per cent)							
Export intensity	21.3	21.0	27.2	26.6	20.0	22.8	23.3
R&D intensity	0.6	1.2		2.4	2.1	1.9	1.5

Source: Prowess Database, 2007.

[45] http://www.balpharma.com/export_drugs.html

[46] http://www.balpharma.com/rd.html

Annexure-3 The Schedule for Interaction with SMEs

ROLE OF GOVERNMENT POLICY IN EXPORTS OF INDIAN PHARMA SMES

1. Company Name: _____ **(To be kept confidential)**

2. Government Supports

A) Existing Internationalization Assistance

Types of Assistance	*How do your perceive the following policy measures in influencing your growth performance?*					
	Awareness	*Insignificant*	*Moderately (-)ve*	*Highly (-)ve*	*Moderately (+)ve*	*Highly (+)ve*
o Exemption of export earnings from corporate income tax	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
o Market Development Assistance for Exporters (MDA Scheme)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
o Market Access Initiative MAI Scheme	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
o Duty Drawback Scheme	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
o Duty Exemption Scheme (i.e. advance licenses)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
o Duty Remission Scheme (i.e. Duty Free Replenishment Certificate Scheme and Duty Entitlement Pass Book Scheme)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
o Export Promotion of Capital Goods Scheme	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
o Export Promotion Council/ PHARMEXCIL	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

B) Requirement/Sources of Export Assistance
(1=low, 2= moderately 3= high 4= very high)

Type of Assistance	*Requirement*	*Availing Benefits Govt. Source (Yes/No)*
Training in the basics of exporting (e.g. letters of credit, documentation)		
Assistance in developing an export strategy and plan		
Understanding business practices, regulation and cultures in specific export markets		
Assistance in finding appropriate distributors or agents to sell in export markets.		
A databank on distributors or agents in specific export markets		
Assistance to participate in foreign trade fairs/exhibitions		
Information about consumer preferences in specific export markets		
Information about overall pharmaceutical market size and growth rates in specific export markets		
Information about competitors' products and prices in specific export markets		

Information regarding competitors' promotional activities in specific export markets		

3. Constraints on export efforts: *(Please tick in appropriate box)*

Types of Constraints	*Very Significant*	*Moderately significant*	*Not a problem*
o Documentation and Approval Procedural Hurdles in Export Marketing	[ ]	[ ]	[ ]
o Lack of Information Services on Overseas Markets and Potential Buyers	[ ]	[ ]	[ ]
o Lack of Access to Low Costs Finance for Exports	[ ]	[ ]	[ ]
o Inadequate Tax Concessions and Other Incentives for Exports	[ ]	[ ]	[ ]
o Inadequate Government Assistance/Incentives for Getting Approvals of Overseas Regulatory Bodies like USFDA	[ ]	[ ]	[ ]
o Higher Transport Costs	[ ]	[ ]	[ ]
o Limited Managerial Resources	[ ]	[ ]	[ ]
o Inadequate In-house R&D investment	[ ]	[ ]	[ ]
o Insufficient Access to Laboratory Testing Facilities	[ ]	[ ]	[ ]

4. Policy support measures that you think may be helpful for your company's export activities:

_____

_____

_____

_____

Thank you very much for your cooperation and supports.

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