

EXECUTIVE SUMMARY

1. Introduction

Small and Medium Enterprises (SMEs) form a major business sector all over the world. According to one estimate more than 95% of enterprises across the world are SMEs accounting for 52% of private sector value added. The contribution of SMEs to a nation's GDP varies across the countries; being 16% of GDP in low income countries to 51% of GDP in high income countries. In countries like Japan or China 60% of GDP comes from SMEs, in USA this goes up to 65% while in European Union it is around 52%. India has estimated 48.8 million of SMEs employing close to 40% of India's work force and contributing 45% to country's manufacturing output. However due to low scale and poor adoption of technology, the SMEs have poor productivity, and contribute only 17% to the Indian GDP (1. *Economic Times Bureau, Malini Goyal, 9th June 2013*; 2. *The Dynamics and Importance of SMEs in economy, Maxmilian Robu, The USV Annals of Economics and Public Administration, Volume 13, Issue 1(17), 2013*). Thus promoting innovation in Indian SMEs assumes importance.

2. Background

2.1 The Department of Science and Technology (DST) had sponsored a National Survey of Innovation (NSOI) that covered around 9000 industrial firms of all sizes and sectors, across India. One of the significant statistical findings of the Survey was that for two-thirds of the innovative firms, innovation was in introducing new machines and production equipment, which is in conformity with the prevailing trend in other BRIC countries as well.

2.2 As a follow up of the finding DST has supported the present Study to make an in depth assessment at the firm's level of the status, systems, and strategies of innovation adopted by Small and Medium Enterprises (SMEs) in the machinery and equipment sector. This sector was chosen as it is one of the top five innovative

sectors identified by the NSOI in several of the States in the country. Based on the share of the innovative machinery and equipment firms in the States as a percentage of the total innovative firms in India and their Innovation Potentiality as detailed in the NSOI, SMEs clusters of machinery and equipment manufacturers in the five regions of Ahmedabad-Vadodara (Gujarat), Mumbai-Pune (Maharashtra), Ludhiana-Batala (Punjab) or Chennai-Coimbatore (Tamil Nadu) and the NCR were selected for the Study.

3. Objectives

The objectives of the Study were to carry out an in-depth knowledge-based study at firm level for assessing the:

- Status, Processes and Strategies Of Innovation,
- Types of Innovation,
- Outcome of Innovation,
- Stimulants and Retardants for Innovation and
- Indicators of Innovation.

4. Methodology

4.1A desk study undertaken by the Investigators revealed that a majority, around 300 SME manufacturing machinery and equipment are distributed among the four industrial sectors of Pharmaceutical, Chemicals, Plastics, and Machine Tools sectors among these five regional clusters. Thus around 300 firms (298 firms to be exact) were identified based from sources such as the State Commissioners of Industries, DICs, regional offices of NSIC and relevant Industries Associations.

4.2The broad methodology adopted for the Study comprised survey through structured questionnaires as well as through personal visits and detailed discussions with select innovative firms. Thus the Study was divided in two Phases; the **Phase-I** pertained to identifying 'Innovative' SME firms in the above four

industrial sectors in the above five geographical clusters. The **Phase-II** comprised in depth person based studies of most 'Innovative Firms' identified in the Phase-I.

4.3 The Study has used Oslo definition of 'Innovation' and 'Innovative firms'. The Manual inter-alia identifies four types of innovations namely product, process, marketing and organizational innovations. Also according to the Manual, the common feature of an innovation is that it must have been implemented and an innovative firm is the one that has implemented an innovation.

4.4 The data collection through the Survey was knowledge based and not census or statistical oriented and therefore involved understanding and comprehension of the manufacturing sectors to be surveyed and empathy for innovation. Therefore five Knowledge Experts, one expert for each of the regions covered in the Study were engaged to interact with the firms to seek and extricate relevant data/information on their innovation related activities. These Knowledge Experts were senior persons from the industry, R&D and management and consultancy organizations having knowledge and experience of SMEs in the country.

4.5 A questionnaire was designed and finalized for the **Phase-I** survey in consultation with Experts from DST, Dept. of Scientific & Industrial Research (DSIR), National Small Industries Corporation (NSIC) and the Ministry of Micro, Small and Medium Enterprises (Ministry of MSMEs) and administered to all the 298 firms through mail.

It was also hosted at <https://www.surveymonkey.com/s/qpsplstudy> to facilitate **online filling up** of the questionnaire by the firms.

However the response to the postal and electronic survey was extremely poor, only 15 firms or 5% responses were received. As a result the Knowledge Experts undertook personal follow up with the firms, which brought in a good response, as much as 86% (256 out of 298) of the firms responded to the questionnaire.

4.6 A Local Project Advisory Committee (LPAC) for the project was constituted by DST under the Chairmanship of Dr. H.R. Bhojwani, then Adviser to the Minister of

Communication & Information Technology (C&IT) and formerly Advisor to Ministers of HRD and S&T. The results of the Phase I survey pertaining to firms from NCR only were presented to the LPAC which noted the substantial response and suggested that for Phase II also, a questionnaire should be developed so as to structure the collection of data from the firms. The questionnaire for the Phase II sought detailed information on diverse aspects of Status, Systems and Strategies of Innovation of the innovative firms and formed the basis of detailed discussions with the firms during visits to them.

4.7 The project proposal had envisaged in depth in situ studies of status, systems and strategies of innovation in the select most innovative SMEs by Investigators Team & the Knowledge Experts, however during the Phase I surveys, it was found that a majority of the innovative firms around 77% had less than 20 regular employees/workers and around 1/3rd of these had less than 10 regular employees/workers. These micro level firms did not have discernible formal systems/processes or separate departments for carrying out and implementing innovations. In fact in almost all the SMEs, the owners were the innovators and were responsible for managing and implementing the innovations. In view of this in place of in-situ studies, it was decided to carry out detailed studies/discussions during Phase II in the select most innovative SMEs by visiting them.

4.8 Analysis of the responses received from 256 firms in Phase I, to the questionnaire, showed that 208 firms claimed to have done one or more types of innovations among the four types of innovations defined in Oslo Manual. For Phase II, the project proposal had envisaged that around 5-7 most Innovative Firms from each of the 5 regions would be taken up for detailed studies. Thus a list of around 20 firms from each region, in total around 100 firms, were identified (on the basis of their responses and also by consulting their web site) and contacted for visits and detailed studies. However, most firms were reluctant to the visits and sharing of detailed data. It was after lot of persuasion by the regional Knowledge Experts and through the personal contacts of the Principal Investigator that 30 firms in all from

the five regions finally agreed for the visits and the discussions with the Investigators.

4.9 Based on the visits and discussions, detailed studies reports have been developed on 29 firms (one firm out of the 30 identified firms, on visit was found not to have significant innovation activity and thus has been dropped from the list of innovative firms). These detailed studies form **Part II** of the report.

4.10 The visits to the innovative firms were made by Team of Investigators along with the regional Knowledge Experts. The Chairman of the LPAC was invited to join the Team in visiting first few firms, in order to advise and guide the Team in their discussions and enable a template for detailed studies to be standardized. The discussions with the firms focused on the evolution of the firm, the innovations (products, processes, marketing and organizational) carried out, their implementation, systems and strategies of innovation, their management, IPRs, issues with Government etc. The Team also visited the workshops/factory areas (wherever permitted by the firm) to observe the shop floor practices. The visits varied from half a day to full day depending upon the firm's willingness to participate in the discussions and to the extent it was willing to share the information and show their shop floor practices.

5. Analysis of Data

5.1 The analysis has focused on studying the relationships/effects if any, of diverse parameters/factors of a firm such as its size, manpower, ownership, age, turnover etc. on innovation or innovativeness of a firm. The data besides presenting the analysis of the total participating firms as a whole, also presents the analysis on the regional as well as on the industrial sector basis. **However it may be noted that the results of analysis are in respect of the participating firms and in no way represent an inter regional or inter sectoral comparison of innovative capabilities.**

5.2 The results of the analysis are:

- i. Of the 256 firms responding in Phase I, 88% are SMEs and of the 30 firms studied in Phase II, 87% are SMEs.
- ii. Of the 256 firms, 208 or 81% claim to have done one or more types of innovations among the four types of innovations defined in Oslo Manual. The remaining 48 or 19% firms did not claim any innovation. Thus out of 256 firms 208 are Innovative Firms (IF) and 48 are Non Innovative Firms (NIFs). Again among the IFs, the SMEs have a share of around 86%.
- iii. The size of the firm in terms of investment on plant and machinery does not appear to have effect on innovativeness of the firms as the participating IFs included firms with plant and machinery investments as small as Rs.10-15 lakh to as high as Rs.12000 lakh. The firms with smaller capital investments have been as successful in developing and commercializing machinery and equipment as the firms with comparatively larger investments have been.
- iv. The Phase I data shows that as regards ownership aspect, the share of proprietary firms (including the partnership and family firms) in IFs is 75% and in NIFs it is 79%. This is again confirmed in the Phase II, where the proprietary and partnership firms have a combined share of around 67% of which the proprietary firms alone account for a share of 47%. The data thus confirms that innovation in SMEs is owner driven.
- v. Since the innovation in SMEs appears to be owner driven, an effort was made to relate the educational qualifications/background of the owner or the overall educational assets in a firm to its performance in innovation. The detailed studies in Phase II reveal that, the educational qualifications of the owners or the numbers of qualified engineers or other technical personnel in the firm or on other words the educational assets of the firm, do not appear to have any significant effect on its performance in innovation. Thus among the innovative firms studied in Phase II, there are firms with owners having

qualifications of school leaving certificate or a graduation in humanities only, yet they have successful innovations to their credit in machinery manufacture, a sector far removed from their educational qualifications.

- vi.** The Phase I data of sales turnover *vis a vis* Innovation do not reveal any specific trend. In fact the analysis based on total IFs & NIFs and that of IFs as per their regional and sectoral distribution shows contradictory results. On the other hand the Phase II studies reveal that firms with a turnover of as less as Rs.100-150 lakh were as innovative (evident from the fact their production is based on their own developments) as their counter parts with much larger turnover of Rs. 5000 lakh and above. Thus the sales turnover does not appear to have a bearing on the innovativeness of the firm.
- vii.** The decadal distribution of 208 firms according to their age (based on the year of their establishment) shows that there are higher numbers of Innovative Firms among the younger firms in all the regions except Ludhiana, which shows in general that younger firms tend to be innovative (which may be due to rising competition, increased awareness or access to new knowledge, better infrastructural facilities etc.). As regards the situation in Ludhiana, the reasons as surmised from the discussions with the firms in the regions appear to be that the overall industrial activity in the Ludhiana–Batala region has declined since globalization. This is also supported by the data which shows fewer firms have been established in the region in the recent decades. Thus among the 256 firms, while the number of firms established in the decades prior to 1990 in Ludhiana-Batala region is 39, in the decades post 1990 it has gone down to 14 only. This being the case also with the IFs- the respective numbers being 35 and 13 only.
- viii.** Phase I data shows 56% of Innovative Firms had an increase in production over time in contrast to 29% of the Non Innovative Firms showing a decline. However the Innovative Firms were not able to quantify the increase in production owing to innovations made by them, their own estimates place

this increase to be in the range of 5-10% only.

- ix. The size of manpower deployed in a firm also does not appear to have an effect on the innovativeness of the firm. Thus among the 208 innovative firms of Phase I, nearly, 77% have regular manpower of less than 20 and even among these around 30% of firms have manpower of less than 10. Again among the 30 firms studied in Phase II, while there are a few innovative firms having a significant number of qualified engineers and diploma holders, there are several other firms having engineering/ technical manpower of only around 2-3 persons (including the owner) and yet have developed and commercialized equipment and machinery successfully.

6. Detailed Studies

6.1 The extent of participation in the detailed studies by the firms from the different region varied; most participation was by firms from Coimbatore region and the lowest from the Vadodara- Ahmedabad region. Again Machine Tool firms had largest participation, 18 firms compared to only one from the pharmaceutical equipment manufacturer.

6.2 The detailed studies show that for most of the firm's innovation lies in reverse engineering of equipment and machinery available in the market, from indigenous sources or from imports. However there is no denying the fact that some of these firms have developed and incorporated newer features and functions in the available machines, to suit locale-specific conditions/ environment. Some of the examples include that of **Zeenath Industries, Coimbatore** who has increased the output of the existing plastic collar bone making machines by more than 50%; **Hikon, New Delhi** improving the design of screw barrel in plastic manufacturing machinery to remove almost 80% of gases/moisture formed during operation compared to 30% in the existing designs; **Ravjeet Engineering, Pune** reducing job cycle to less than half on Gear Chamfering & de-Burring machine thereby doubling

the output and **K-Tex from Coimbatore** having developed a brick casting machine capable of casting 50-75,000 bricks per shift as against 9,000 bricks per shift in machine generally available and with much reduced manpower.

6.3 Besides the above, there are few examples such as those of **Arma Product Coimbatore**; **PMT Machines, Ludhiana**; **Sparkonix, Pune** etc. where improvements in performance and significant savings in energy have been brought about by incorporating power back up, PLC/CNC controls, servo motors etc.

6.4 There are other firms, who have developed machinery for first time in India or are the second manufacturer in the world/Asia after the original manufacturer. These include **Inverted Vertical Wire Drawing Machine by Assomac, Ghaziabad (second in Asia after Taiwan)**; **Double Flank Gear Roll Tester by Ravjeet Engg. Pune (only manufacturer in India)** and **Vented Screw Barrel by Hindustan Plastics, New Delhi (first to develop in India)**.

6.5 The detailed studies further showed that a few of the participating firms realizing the increasing competition and stricter enforcement of IPRs are moving towards original designs/development rather than reverse engineering as at present. Thus **Acufil Machine Coimbatore** is developing a machine to **remove aflatoxin**-a safer method compared to existing chemical and irradiation processes; **a Table Top CNC Lathe by K-Tex, Coimbatore**, **a Carbon Dioxide Incubator by Biomate, New Delhi**, **a Tissue roll bundling machine with doubling the capacity by SP Automation, Coimbatore** etc. are few of the examples of novel machinery and equipment development.

7. Status, Systems and Strategies of Innovation

7.1 Status of Innovation

- i. Product and Process innovations form the bulk of the Innovation claimed by IFs in Phase I. Almost 47% of IFs claimed Product and Process innovations,

and 34% firms claimed marketing innovations. Firms with Organizational innovations have the lowest share of only 19%. The Product/process innovations claimed comprise innovations relating to products, processes, quality and product standardization, saving/ substitution of raw materials/inputs and software developments. Similarly the Marketing innovations comprise new marketing strategies/ concepts, creation of new markets, improved marketing logistics etc. The organizational innovations comprise new methods of organizing work responsibilities, decision making, setting up external relations etc.

The innovations claimed under the above classifications have been further classified as innovations 'New to Firm' and 'New to Industry' to assess their novelty.

- ii. In the area of Products and Processes development the innovations claimed by most firms belong to the 'New to Firm' type. However 30 firms (26 for products & 4 for processes) claimed their innovations as 'New to Industry' or in other words globally new, however as they could not back up their claims with proof of novelty such as patents, designs or copy right etc. it was not feasible to accept their claims. More so as most of these firms exhibited absence of knowledge of IPR subject and even those who had some knowledge of the subject did not fully appreciate the importance of IPRs.
- iii. In the case of marketing innovations, there are claims of 'New to Firm' types as well as 'New to Industry' types. In fact 18 firms have claimed to have developed innovations of the latter type. The studies however have revealed that most of these firms have adopted use of internet, portal marketing, and franchise marketing etc. which in fact cannot be termed as global novelties. One of the firms near Delhi has developed a centralized marketing arm for its machinery through a virtual firm which again at best may be new to the machinery sector but is not a global novelty as similar marketing practices are being adopted in many sectors.

- iv. In the area of Organizational innovations most innovations claimed relate to improved shop floor processes/ practices such as improved material /product inventory systems, factory layout facilitating efficient product/ material flow etc. which have been adopted by these firms for first time and have been claimed as 'New to Firm' types of innovations. However there are claims by 8 firms of globally novel organizational innovations. The detailed study of the three firms who shared their so called novel organizational practices, in fact reveals these to be as participative management practices involving workers, employees and management in decision making process. These include a modified TQM, monthly 'No Agenda' or free exchange meets and 'Self Targets fixing' meets between workers, employees and management which may be a novel to small scale sector but cannot be termed as globally novel development in the industry.
- v. Thus it emerges from the overall analysis of the data of the Study that the innovation in SMEs is owner driven and the educational assets of the owner or of the firm have no effect on innovativeness of the small and medium firms. Similarly the firm's size, sales turnover, age and manpower employed in the firm have no perceptible effect on the innovativeness of the small and medium firms. The SMEs are largely engaged in incremental innovations only and have been adept at reverse engineering of the existing machinery and equipment successfully. However as emerged from the detailed studies of the select Innovative Firms, a brighter side to this picture is evolving which is a realization by many of the SMEs that to stay in the competitive market they have to go for their own products and designs. Thus some of the firms have started working on the development of novel machinery and equipment based on their own ideas/ designs and development.

7.2 Systems of Innovations

- 7.2.1 Most SMEs do not have discernible or formal systems instituted for innovation. Invariably it is only the owner who is responsible for the entire process of

innovation, starting from idea generation for a new product to its evaluation, design and development to its implementation. Some of the firms have formal/informal mechanisms of consultations by the owner with other senior persons of the firm in idea generation and evaluation however such firms are miniscule in numbers and even in these firms it is the owner who takes the final decision. Again most firms have very small set ups/facilities for carrying out design and development. They supplement their in house efforts sometimes by outsourcing design development or fabrication of parts and components. Most innovative SMEs shared that they prefer outsourcing technical assistance in design and development from individual consultants/ experts, especially those retired from senior positions in the public and private sectors as they have found it more convenient, faster and cost effective method of finding technical solutions. They, surprisingly, were not found seeking assistance of publicly funded R&D institutions. The reasons according to them include lack of awareness on the part of the SMEs of existence of such a system or the infrastructure/facilities available with these institutions, lack of adequate or updated technical knowledge/information with such institutions, non adherence of delivery schedules, bureaucratic procedures/paper work involved and services being comparatively costlier. Our findings are in close agreement with the findings of two studies of Small Manufacturing Firms of the West Midlands area of UK. The study of 1000 manufacturing SMEs by Laforet and Tann addressed innovation management in terms of the interrelationship among the three elements of a business: product, process and ways of working using ten indicators to measure company innovativeness. The top 20 per cent firms were compared with bottom 80 per cent firms in terms of product innovation management, process and work organization. The main two findings, practically identical to the present Study were that the drivers of innovativeness were: market anticipation, customer focus and commitment of CEO/owners to new product development, processes and new ways of working. And the main constraints to innovation were customer dependency, skills and knowledge acquisition through training, poor learning attitude and networking because of their tradition of being insular and autonomous (*Innovative characteristics of small*

manufacturing firms, Sylvie Laforet, Jennifer Tann, Journal of Small Business and Enterprise Development, Volume: 13 Issue: 3, 2006).

In another study by Mark S. Freel, in mid-nineteen nineties surveyed 238 firms of West Midlands, with 52% of firms having less than 21 employees inter alia, concluded that "the level of firm interaction with external agencies is disappointingly low and that the principal barriers to collaboration are "lack of trust" and "inability to find suitable partner" (*Barriers to Product Innovation in Small Manufacturing Firm, Mark S. Freel, International Small Business Journal, January 2000 vol. 18 no. 2 ,pp60-80*).

7.2.2 Data from Phase I and detailed discussions with firms in Phase II show clearly that endogenous R&D is not an essential pre-requisite for innovation especially by micro, small and medium firms. This finding is corroborated by Jesus Lopez-Rodriguez, who found from the 2007 Innobarometer Survey of 4395 innovative European firms that 52.5% innovate without performing R&D and 40% of innovating firms in the German industry are non-R&D performers (*Arundel et al, 2010*). He goes on to add that small size firms with weak in-house innovative capabilities, absence of staff with tertiary education and or lack of exports are more likely to innovate without performing R&D. Innovation, he concludes takes place through non R&D activities such as minor modifications or incremental changes using existing engineering knowledge; imitation or adoption of innovation developed by users and combination of existing knowledge in new ways. The present Study also establishes that innovation in most of the innovating firms studied takes place through any one or a combination of the activities, enumerated by Jesus Lopez-Rodriguez.

7.3 Strategies for Innovations

As regards the strategy for innovation in SMEs, invariably for almost all the firms, the customers' requirements or market needs are a driver for innovation. Intelligence for innovation is driven by them from visits to domestic and international

fairs and exhibitions. Besides many of the firms have put in place in house formal and informal mechanisms such as administering 'Customer Input Sheets' or 'Data Sheet' to know not only customers' needs but also to get to know of the market trends/needs. However, most firms expressed that they would not like to undertake development and manufacture of a machinery or equipment unless there was an identified market or customer for it. Our findings are corroborated by Ebru Beyza Baarcelik who interviewed 33 SME owners and managers in Istanbul, Turkey. Using a modified version of analytic hierarchy process he concludes that customers drive innovation and firms often work closely with them (customers) to meet their requirements. Sometimes new ideas may also come from customers [*'A Research on Determining Innovation Factors for SMEs', Ebru Beyza Bayarçelika, Fulya Taşelb, Sinan Apakc, Gelişim University, Istanbul, 34315, Turkey, 10th International Strategic Management Conference, (Edited by Mehtap Özşahin, Procedia- Social and Behavioral Sciences Volume 150, 15 September 2014)*]

8. Stimulants and Retardants for Innovations

The Study has sought to identify the stimulants and retardants for innovation in the SMEs. It has discerned that:

8.1 Stimulants

- I. Most of the firms surveyed indicated that the market/customer acts as the main stimulant to innovate. Thus customer's requirements and demand gets their top priority followed by entering/creating new markets. They were emphatic that though adding new products or processes could be a consideration for innovation however they would not undertake development and manufacture of a new machinery or equipment unless there is a market or customer for the same. Improving production efficiency, quality of their products to remain in competition are few of the other stimulants for innovation and for this many firms have brought in or were continuingly making/incorporating improvements and modifications in their designs.

- II. The presence of a wide network of National Innovation System was no stimulant for them for going for innovation for reasons stated above. As regards Govt. Schemes or policies to assist SMEs in innovation there appeared a general lack of awareness among the SMEs and thus was not identified by them as a stimulant for innovation.

8.2 Retardants

As regards retardants, most SMEs identified lack of finance as a main retardant for them for going for innovation. Among the other major retardants identified for innovations are the lack of knowledge for futuristic machinery and equipment, including that of open sources of information such as internet, patent documents etc. and their usage. The non availability of trained or skilled manpower especially with multi disciplinary skills for R&D and uncertain market demand for novel product and consequently recovery of R&D investments were the other factors inhibiting their innovation activities. Again the growing lack of manpower at technicians' level for the SMEs is also affecting their efforts to go for new products. The Govt. present policies relating to tax, imports, higher cost of land for expansion even for undertaking manufacture based on their innovation and severe pollution restrictions were the other factors discouraging SMEs in going for innovations.

9. Innovation Indicators

The Study has endeavored to identify the possible indicators both from the input as well as the output side to assess the status and process of innovation in an SME. The Study has shown that for SME firms, the size, ownership, educational assets, turnover, age, manpower and interaction with National Innovation System (NIS) are not a determinant of the innovativeness of the firm. The only indicator of innovation of the firm is the creativity and innovativeness of the owner of the firm who drives and manages the innovation. The owner's personal inclination and initiatives for innovation appears to be a reliable and determining factor for an SME being innovative or non innovative.

As regards the Output Indicators, the technological outputs of an innovation process are development and introduction of product or a process new to the firm or new to the industry, acquisition of IPRs and economic effects such as increased output/production, financial gains, higher sales, creating new markets etc. Thus these could be reliable Output Indicators of the Innovation process in SMEs. The present Study shows that 56% of the innovative firms have realized, owing to their innovation increased turnover, albeit a little. But securing any IPRs for innovation has been sadly missing, due to lack of knowledge of the subject with the firms. Thus, while the 'Innovation Indicators' on output side are discernible and identifiable, on the input side it is mainly the owner's inclination, initiative and zeal to go in for innovation which is the determining but non-discernible factor.

10. Suggested Policy Prescriptions

Arising from the findings of the Study, the major policy measures to promote innovation amongst MSMEs that emerge are to:

- Establish an Innovation Fund of Rs. 1, 00, 000 lakh for a 5 year period for MSMEs.
- Set up a Meta Data/Information Referral Bank for the sources of information of relevance and utility of MSME.
- Create a National Register of Retired Experts willing to assist the MSMEs.
- Proliferate knowledge and skills of IPRs amongst MSMEs.
- Realign the focus of publicly funded institutions to assist MSMEs on information, training, design, prototyping and testing.
- Recognize and showcase the innovation achievements of micro and small-innovators.
- Accord protection to Indian products from unfair imports, especially from China.