Performance of Indian Food Products Industry:

A Study of Structure, Innovation and Growth, 2000 – 2010

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2015

Published by :
CSIR-National Institute of Science, Technology and Development Studies
(CSIR-NISTADS)
Pusa Gate
Dr. K.S. Krishnan Marg
New Delhi-110 012

First Published 2015

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This Report has been prepared under ISTIP (Indian S&T and Innovation Policy) Project- First Study of its kind focusing on various dimensions of innovation activity in India; aiming at providing valuable inputs for S&T and Innovation decision making.

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Summary

The Indian food products industry witnessed a steady growth over the past few decades due to the demand upsurge partly led by population growth and partly due to increase in the per capita consumption of processed food together with some improvements in supply-side factors. Informal sector has a sizeable share in the gross value added by the food industry and absorbs a large number of unskilled and skilled workers who are not employed by other formal sectors. The most significant changes that have taken place over the last decade are: (a) a considerable rise of the share of formal sector enterprises engaged in *'Manufacture of dairy products'* (152) in the gross value added (GVA) by the food products industry as a whole; (b) the share of informal sector enterprises involved in '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds'(153)* in GVA of food industry has fallen; (c) for the product category, '*Manufacture of other food products (154)'***,** the share of formal sector has fallen in the GVA of the food industry. The share of informal MSMEs has remained consistently higher in the various food sectors than the formal sector over the decade (2000-2010). The share of MSMEs in total GVA has increased in the product category, '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds*' by a much higher rate, as compared to the other product categories over the span of ten years.

In 2009-10, Andhra Pradesh outperforms in terms of contribution to the total GVA under '*Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats*' (151) by the micro enterprises, with a contribution of around Rs 66.98 crores, which is around 1.75 times higher than it was in 1999-00. Andhra Pradesh also experienced the highest increase in capital intensity among the micro-enterprises over the decade. Madhya Pradesh displays the highest productivity in 2009-10 for the product category 151. Gujarat displays the maximum productivity in manufacture of the dairy products. In the case of dairy products, there has been a 4.5 fold rise in the GVA for Gujarat during 2000-2010. Under '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds'*, Andhra Pradesh emerges out as a leader and tops the list by contributing a total GVA of around Rs. 2260 crores. Andhra Pradesh is followed by Maharashtra (Rs. 1220 crores) and Haryana (Rs.1070 crores). In the case of *'Manufacture of other food products'*, Maharashtra becomes the leading state with GVA of Rs. 4490 crores.

An analysis of business linkages among various food manufacturing units depicts that there exists instances of contractual linkages between differently scaled units. Consequently we can predict that the large scale firms might contract out manufacturing activities to the smaller units and in turn these large units might share expertise and technical knowledge with the smaller counterparts. ASI and NSSO data endorse the fact that the young enterprises or the start ups engage in one or more contracts and achieve higher productivity. It is also noted that the productivity (value added per labor) and capital intensity are

lower in case of formal MSMEs than the larger firms. The reason behind the low productivity in MSMEs could be the use of more labor intensive techniques instead of up graded machine technology. It is also marked that the small scale manufacturing units which are engaged in some contractual relationship with the large firms attain a higher productivity than their peers which do not involve in any form of contracts. India mainly exports Crustaceans and fish frozen (whole) in the international market and its leading trade partners are USA, Japan, Spain, China and UK. In addition, as a result of some sub-sector specific policies being adopted recently, exports of fruits and vegetable products and marine fish products are freely allowed.

Using various indicators of technology levels it is observed that most of the food manufacturing units use lower medium to higher medium levels of technology. However it is further observed that there has been some technological innovation across food industries between 2000 and2010.It is also obvious from the size class-wise statistics relating to various technology levels that there has been a scale up within the food manufacturing units and a decline in the number of micro and small enterprises using low level technology over the decade[1]. Yet overall technology level is not at all high or advanced. Small and micro enterprises predominantly use medium technology. The reason behind the present technological backwardness can be attributed to the various hardships, particularly in accessing finance that these units face in up gradating technology. Paradoxically the medium and large food manufacturing units have witnessed a significant technological advancement over the decade. This could be due the exigencies of peer pressure/stringent quality control of food products abroad requiring advanced techniques of production. An increase in the demand for processed food in domestic and global market has thus contributed to technological innovation within the food manufacturing sector. Yet the overall technology level of the Indian food manufacturing is quite low and there is an urgent need of substantially raising its technology level.

[1] *Around 15-16% of the micro enterprises are found to be upto 5 years age in both the years, 1999-00 and 2009-10, although in the latter year it is slightly higher.*

Chapter 1

Introduction

The report analyses the performance of the Indian food industry in the recent times, particularly in the last decade. The present chapter being introductory provides an overview of the food products industry in India. The next one, Chapter 2 discusses the major constraints faced by the food products industry and its growth performance during 2000-2010. It then makes a detailed analysis of food industry as regards size structure, productivity, growth, value added, contractual relationship, exports as well as their regional variation. The last one, Chapter 3 makes an estimate of the technology levels of the various manufacturing units and based on this infers the pattern of innovations made by the different size classes and subsectors of manufacturing units between 2000 and 2010.

The final produce of agriculture, animal husbandry and fishing is processed into food and drink for human or animal consumption by the food industry. Food products are the most important or basic consumable commodities of the mankind. The Indian food products industry has been consistently growing over the past few decades due to increase in demand partly led by population growth and partly due to increase in the per capita consumption of processed food together with some supply-side factors. Two important demand side factors noted in the report of the Consulate General of India, Guangzhou are as follows:

- With a huge population of 1.1 billion and a population growth rate of about 1.6 % per annum, India is a large and growing market for food products."
- "Its 350 million strong urban middle class with its changing food habits poses a huge market for agricultural products and processed food.

The Government of India has introduced a number of schemes for providing financial assistance for setting up and modernizing food processing units, building infrastructure, supporting R&D and skill development to encourage the growth of the processed food sector. The national policy on food processing "aims at increasing the level of food processing from the present 2% to 10 per% by 2010 and 25% by 2025. The Policy will seek to create an appropriate environment for entrepreneurs to set up Food Processing Industries through fiscal initiatives and interventions like rationalization of tax structure on fresh foods as well as processed foods and machinery used for the production of processed foods. 100% FDI allowed in the food processing sector and cold chain infrastructure." (Consulate General of India, Guangzhou: Food Processing, http://cgiguangzhou.gov.in/business/business_details/5)

The rise in per capita consumption of processed food was a result of interactions of a host of factors like changes in tastes/ fashions in favour of processed food, women employment and shortage of time for cooking, improvement in the food distribution systems in recent years, which may reduce the need for home food storage. On the supply side, improvement in food processing, packaging, refrigeration and transportation technologies contributed to the development of the food industry. Further, a fast rising urban middle class offering a huge market for agricultural products and processed food added to the growth of the industry. Food Processing Industry benefits both the farmers as well as processors. This industry thus has a great potential in our country, although presently the size of the Indian food industry is very small.[2]

Table 1 Processing Levels in Indian Food Products

Segment	**Processing level in India**
Fruits and Vegetables	2.2%
Fisheries	26%
Poultry	6%
Buffalo Meat	20%
Milk	35%

Source: Ministry of Food Processing Industry, Govt. of India

There is a significant potential for the organized processing players in fruits and vegetables sector, as the existing level of processing is very low (as shown in Table 1), and there exists a vast supply base, along with a considerable international demand for certain fresh as well as processed fruits and vegetables. Due to the high processing levels, milk products offer a significant opportunity in India. India is the world's largest producer of milk owing to the strong business models formed through cooperative movements in the country. Milk and related products account for 17% of India's total expenditure on food. In the case of milk products 51% foreign equity participation is allowed for almost all the items excepting malted foods and further all exports of dairy products are freely allowed.[3]

There have been some shifts in the market conditions which would greatly favour the demand and supply responses of the food industry and thereby strengthen its potential for fast growth in India:

- Fast growth in organized retail over the last two decades, a catalyst for the food industry as noted in the West

[2] *Consulate General of India, Guangzhou: Food Processing.*
[3] *Consulate General of India, Guangzhou: Food Processing*

- Consumer trend towards convenience and 'enjoying life' driven by demographic trends in age composition towards higher weight of young people, income-levels and more women in the workforce
- Global shift to outsourcing from India across products/ services including food
- De-regulation and liberalization of the Indian economy, driven by central and state governments. Prior to the 1990s liberalization regime, the food processing sector was largely seen as a sector producing luxury goods. Successive budgets from 1990 onwards, made significant changes in tax rate which helped in the growth of this sector. Due to high taxes earlier, the growth of this sector was stunted.

An important supply side factor is the technical improvements in manufacturing processes which has been aided by improvement in transportation facilities together with the shifting of many industries from the home to the factory. Examples of the shift are canning of fruits and vegetables, pickles, the preparation of poultry products, as well as processing of various dairy commodities. Along with this the bakery and confectionery industries have also experienced major changes brought about by increasing demand primarily due to urbanization and changes in lifestyles of the people. New products have been introduced in the market, and many more old products have been presented to the public in new ways.

'Manufacture of food products' involves production activities related to several kinds of consumable goods, namely, meat, fish, fruit and vegetables, fats and oils, milk products, grain mill products, animal feeds and other food products. Production can be carried out on own account, as well as employing hired workers. Some of the activities are considered manufacturing (for example, those performed in bakeries, pastry shops, and prepared meat shops etc. which sell their own production) even though there is retail sale of the products in the producers' own shop. However, where the processing is minimal and does not lead to a real transformation (as is the case, for example, for butchers, fishmongers etc.), the unit is classified to wholesale and retail trade[4].

India is the world's second largest producer of food next to China and has the potential of being the biggest in the World. The food industry makes a great contribution to the development of the economy. As per the FICCI-EY report, 2009, food and food products are the largest consumption category in India with a market size of USD 181 billion in 2009. It is also noted that the domestic spending on food and food products amounts to nearly 21% of the GDP of the country and constitutes the largest portion of the

[4] *United Nations statistics division (Explanatory Notes) (ISIC Rev 3.1 Code 15)*

Indian consumer spending. Further, during the period 2009 - 2015 the domestic food market is expected to grow by nearly 40% to touch USD 258 billion by 2015.[5]

India's agricultural base is quite strong with diverse agro-climatic zones together with crop varieties ranging from tropical to temperate crops. The amount of wastage of foodgrains, particularly under FCI storage, is very high; and also in case of fruits and vegetables, especially the perishable ones, wastage is quite significant. All this indicates that processing of food products in India is quite low. It is noted in Singh et al (2012) that the processing of food to consumable standards are at levels of up to 80% in some developed countries whereas the overall processing level in India is around 10%.[6] India's food processing sector is quite small and under developed and, as a result, its share in exports of processed food in world trade, stands at a very low level, about 1.5 percent or $3.2 billion (Bhuyan 2010)[7]. The recent policy of allowing 100% FDI in multi-brand retailing, including food was intended to bring about technology development as it would enable MNCs to introduce latest backyard technology of processing, preserving, storage and transportation of food and related products/raw materials. This would promote marketability of the products and at the same time reduce wastage. Thus, FICCI (2010) report gives high importance to food processing industry in India as it can act as an instrument for up-lifting the rural economy through creating synergy between the consumer, industry and agriculture. A well developed food processing industry is expected to increase farm gate prices, reduce wastages, ensure value addition, promote crop diversification, generate employment opportunities as well as export earnings[8].

In 2012, India was the highest producer of milk in the world at 90 million tonnes per annum and the third largest producer of fish. With an arable landmass of 184 million hectares, it was also the second largest producer of fruits and vegetables and the third largest producer of foodgrains. Apart from having a large and wide-ranging raw material base, it has the largest livestock population as well.[9] Given the enormous scope for value addition, increase in the consumption of processed food products in India and many fiscal incentives being initiated by the government, the food processing sector in India appears to be at the threshold of picking up growth momentum. Further, the possibility of reduced subsidies in developed

[5] *FICCI-EY report, 2009, cited in FICCI (2010), "Bottlenecks in Indian Food Processin Industries", http://www.ficci.com/SEDocument/20073/Food-Processing-Bottlenecks-study.pdf; Average currency exchange rate in 2009-10 was Rs 47 per $1.*

[6] *Singh et al. (2012), 'Food Processing Industry in India: Challenges and Opportunities', Journal of Food Distribution Research , Volume 43, Issue 1*

[7] *Bhuyan, A (2010) "India's Food industry on the Path of High Growth" Indo-Asian News Service, cited in Singh et al. (2012).*

[8] *'Bottlenecks in Indian Food Processing Industry', FICCI Survey report 2010*

[9] *'Indian Food Processing Industry-Opportunities and Outlook 2015', Gyan Research and Analytics Pvt. Ltd. (2012)*

countries under the WTO regime would give a boost to India's strengths in food production and processing industry.[10]

Attracted by the wide varieties of opportunities for investment in processed food sector, several global food giants and leading Indian industrial enterprises already started entering in the sector. Some of them are Nestle India, Cadbury's India, Kellogg's, Hindustan Unilever, ITC-Agro, Godrej Foods and MTR Foods, to mention a few. It is estimated that the food production in India is likely to grow two-fold in the next ten years.[11] Thus, there is ample of opportunities for investments in food and food-processing technologies, equipments, especially in areas of canning, dairy & food-processing, specialty processing, packaging, frozen food and thermo processing, cold chains and in the area of food retail.

According to the Ministry of Food Processing (Vision 2015 document), the size of processed food sector is estimated to treble, processing level of perishables to increase from 6% to 20%, value addition to increase from 20 % to 35% and India's share in global food trade to increase from 1.5 % to 3% by 2015.

Government's policies aim at supporting investment in this sector and recently put emphasis on attracting more FDI. India has strong comparative advantages over other nations, keeping in view the vast pool of natural resources that it endows, and the growing technical knowledge base. According to CII estimates, food-processing sector has the potential of attracting US $33 billion of investment in 10 years and generate employment of 9 million person-days.[12] The food-processing sector in India is clearly an attractive sector for investment and offers significant growth potential to investors.

Table 2 shows the contribution of the food processing industry to India's GDP in recent years. As one can clearly observe, the contribution of food processing industry to GDP has been sharply rising since 2004-05, at a compound annual growth rate of 8.4%, which is much higher than the CAGR in the agricultural and manufacturing sector, over the same period. Further, within the food processing industry, the contribution of registered sector is 11.1%, which is almost triple the contribution made by the unregistered sector. Given this brief introduction of the Indian food products industry, we would proceed to make detailed analysis of the performance, constraints, structural relations, innovations and their regional dimensions in the subsequent chapters. The next one, Chapter 2 discusses the constraints faced by the food products industry and its growth performance during 2000-2010. It then makes a detailed analysis of food

[10] Here, the WTO regime is not referring to the trade negotiations between the developed countries and G-30 (India and developing) countries, but the negotiations between the developed countries. The developed countries have decided among themselves that they will be reducing subsidies provided to their domestic producers.

[11] 'Indian processed food Industry: Opportunities Galore', Way2Wealth Securities Pvt. Ltd. (2008)
[12] CCI (2012), A Brief report on Food Processing Sector in India
[9]FICCI (2010) "Bottlenecks in Indian Food Processing Industry – survey 2010", available at http://www.ficci.com/SEDocument/20073/Food-Processing-Bottlenecks-study.pdf

industry as regards size structure, productivity, growth, value added, contractual relationship, exports as well as their regional variation.

Table 2: Contribution of FPI to GDP at 2004-05 Prices (Value in Rs Crore)

S. No.		2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	CAGR (%)
	GDP at Factor Cost, Of which	29,71,464	32,53,073	35,64,364	38,96,636	41,58,676	45,16,071	49,37,006	52,43,582	8
1	GDP Agriculture*	5,03,786	5,31,745	5,54,395	5,89,383	5,88,757	5,92,110	6,43,111	6,67,446	3.8
2	GDP Manufacturing	4,53,225	4,99,021	5,70,458	6,29,073	6,56,302	7,30,435	8,01,477	8,23,023	7.6
3	GDP-FPI	44,355	47,689	52,161	57,320	60,378	58,752	67,508	78,094	8.4
	Registered	22,148	26,780	30,709	34,753	39,253	37,813	45,042	51,877	11.1
	Un-registered	22,207	20,910	21,453	22,568	21,125	20,939	22,467	26,217	4.1

**Excludes Forestry & Logging, Source: NAS, 2013*

Chapter 2

Industry structure and the performance of Indian food industries during 2000 – 2010: An analysis of constraints, size structure, productivity, inter-linkages and regional variations

It is mentioned above that the food industry has recently made fairly high growth but this is much below the potential as reflected in the low level of processing of food to consumable standards (approx.10%). What are the constraints on the growth and what are challenges faced by the producers and despite all these problems what are the factors that facilitate the growth? This chapter addresses some of these issues together with a detailed analysis of the pattern of growth. Changes in structural relations, labour productivity growth and their regional variations are highlighted.

Challenges faced by Indian Food Industries

There are a number of factors that affected the performance of the Indian food industries as summarised below.

Poor Infrastructure**:** Indian food industries are severely constrained due to poor infrastructure. Specifically the poor rural road connectivity is one of the prominent issues that the food industries in our country face. Due to this problem the food manufacturing units' supply and demand chains are hampered. Poor rural road connectivity often results in delay in procuring raw materials and supplying finished goods in the food manufacturing industries which mainly produce processed food. The low level technology used by the food industry is also an outcome of poor infrastructure. Although India has a good railway network, it suffers a few drawbacks such as lack of last mile connectivity, monopoly of the rail haulage also leads to delay in delivering the materials to the desired destinations. The road transport operators also fail to provide sufficient flexibility as required by the food manufacturing units in India. The Indian roadways also suffer severe challenges; only 2% of the road network is currently covered by the national highways. Port infrastructure in India is no different from rail or road infrastructure despite some improvement in the last one decade. It often results in delay in transporting materials mostly in external trade activities. The low level technology with manually operating activities at Indian ports has a negative impact on the supply chain lead time and has an adverse effect on the food and food processing industry. Inadequate cold storage and warehousing services in our country pose serious threat to the food processing industries, particularly those involving perishable food products (with exception of milk). The warehousing activities in our country are mainly carried out by the unorganized sector which is about 80% of the total market. The remaining 20% of the market is addressed by the organized warehousing

centers. The cold storage facilities in our country are also at a rudimentary stage and hence cater to less than 10% of the agricultural produce in our country. It is to be noted further that these cold storage facilities are primarily provided to potato. Only a minor part of the fruits and other vegetables could benefit from the facilities.

Constraints on raw material production: Although India is the second largest producer of fruits and vegetables and rice, one of the major constraints faced by the food processing industry is the constraint in raw material production: According to the enterprise survey carried out by FCCCI (2010) a quarter of the respondents feels that constraints on the quality raw materials is a big hurdle for the sector. It is further noted in the report that such a scenario would appear due to inferior seed quality, lack of knowledge about the importance of high yielding seed varieties, inefficient and poor cultivation strategies, insufficient inputs, lack of modern farm machinery and poor harvesting methods.

Use of obsolete techniques of production: The food manufacturing units in our country mainly depend on the obsolete techniques of production. This not only reduces the quality of the output but also makes this sector less competent as compared to its global peers. The FICCI survey report suggests that most of the food manufacturing units operate on a small scale and these units have a limited ability to upgrade themselves to modern methods of production. These firms also face an issue of inadequate funds and as a result fail to buy modern equipments that are available in the market. All this leads to a low and often inefficient processing of food products and this leads to an overall increase in the operational cost of a food manufacturing plant.

Necessary research and development activities are not being carried out in our country in the food sector. The food manufacturing units which are export oriented and produce outputs on a large scale mostly import technology. Central institutes, like CFTRI, CIPHET, IIHR, selected IITs and IIMs and State Agricultural University provide specialized courses on food technology and also engage themselves into R&D activities but have been able to develop innovative products, processes and machinery to a limited extent.

Access to timely credits: Food manufacturing units are capital intensive due to the requirement of huge capital. In order to cater to the needs of food manufacturing industry and to buttress the potential of this industry, GoI has declared the financing of food industry on a priority basis. Nonetheless Indian food sector has not experienced the benefits of such schemes due to the flaws in the procedure leading to sanction of funds, loans and subsidies from financial institutions and supporting agencies like APEDA,

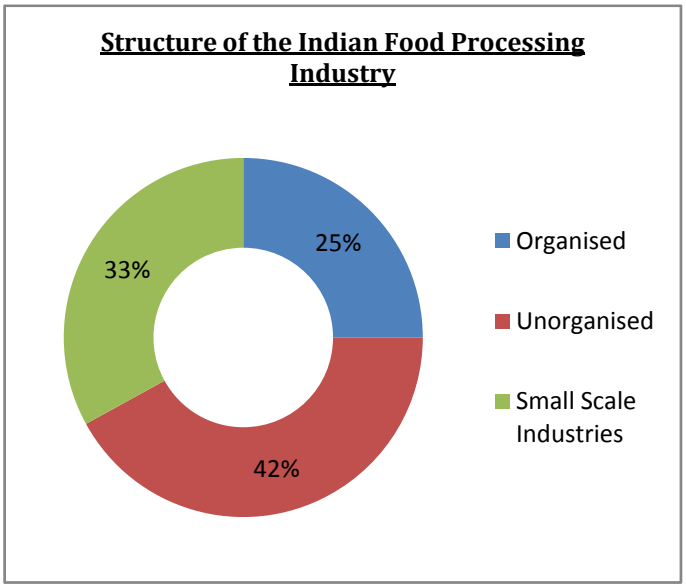
NHB and other state government promotional agencies; 20.8% of the food manufacturing units have stated that non availability of timely and adequate funds is one of vital reasons for the low performance of food industry in India. The FICCI report on the bottlenecks of Indian food industry has clearly mentioned that volatility of farm loan advances, combined with the high transaction costs involved in disbursement (typically 6% to 7% of the loan amount) has limited the activity of organized institutions largely to top section of the farmers, thus choking credit for marginal farmers at the bottom of the pyramid.

Recent Trends in Food Industry

The role of food industries in the Indian economy is of paramount importance. The inter linkage between the food industry with the agricultural sector of our country plays a vital role in upbringing of our economy to a great extent. There have been important changes over the last two decades in the business environment of the food sector which prove to be useful for the development of the food manufacturing units. Post liberalization phase has seen adoption of numerous policy measures on food industries, dealing with export import laws, fiscal policies, taxation, exchange and interest rate control and promotion of export. No industrial license is currently required for the food and agro business sector of our country except for beer, wine, potable alcohol, cane sugar, hydrogenated animal fats and oils and items reserved for manufacture in small scale sector. In order to support the food processing industry center has approved under the income tax act a deduction of 100% of the profit for the first five years and 25% in the next five years for the agro processing industries which have been set up for packaging and preservation of fruits and vegetable in the Budget 2004-05.

Rigorous initiatives are also taken up to manage the supply and demand chain more efficiently by leveraging Indian food industries to handle the relationship with the farmers and unorganized sectors in order to have quick access to the raw materials and agricultural outputs. This would however replace the traditional middlemen. Under the current Industrialization pattern the Indian food manufacturing units have witnessed a large number of acquisitions and joint ventures with their global peers. Advanta Seeds in 2006 was acquired by the United Phosphorous which had 100% stakes in it. The Godrej Herschey Food and Beverages predominantly in the sugar and confectionary sector was acquired by Herschey Company in 2007.The Trinethra food retail chain was taken over by Aditya Birla group in 2007. International Players like Walmart, Metro, TESCO, Lavazza, Orkla Foods, Auchan and many more have entered India in recent years. Liberal policies with respect to foreign direct investments have been adopted; 51% FDI have been very recently granted for multi-brand retailing, including food. Progressive changes have also been introduced in fiscal and taxation policies with respect to the food industries. Food processing Industry has been designated as one of the prospective sectors pertaining to exports. In order

to promote export in the food industries GOI has taken initiatives to establish free trade zones and export processing zones. India possesses a great potential for agricultural activities due to the vast area available for cultivation and appropriate climatic conditions for cultivation. These factors supposedly are one of the vital reasons that would bring in substantial investments from the multinational foods Industries in our country. Corporate catalyst of India's report on food processing industry illustrates various advantages that the Indian food processing Industry has when compared to its counterpart.



Source: FAIDA / Ministry of Food Processing Industries

Figure 1

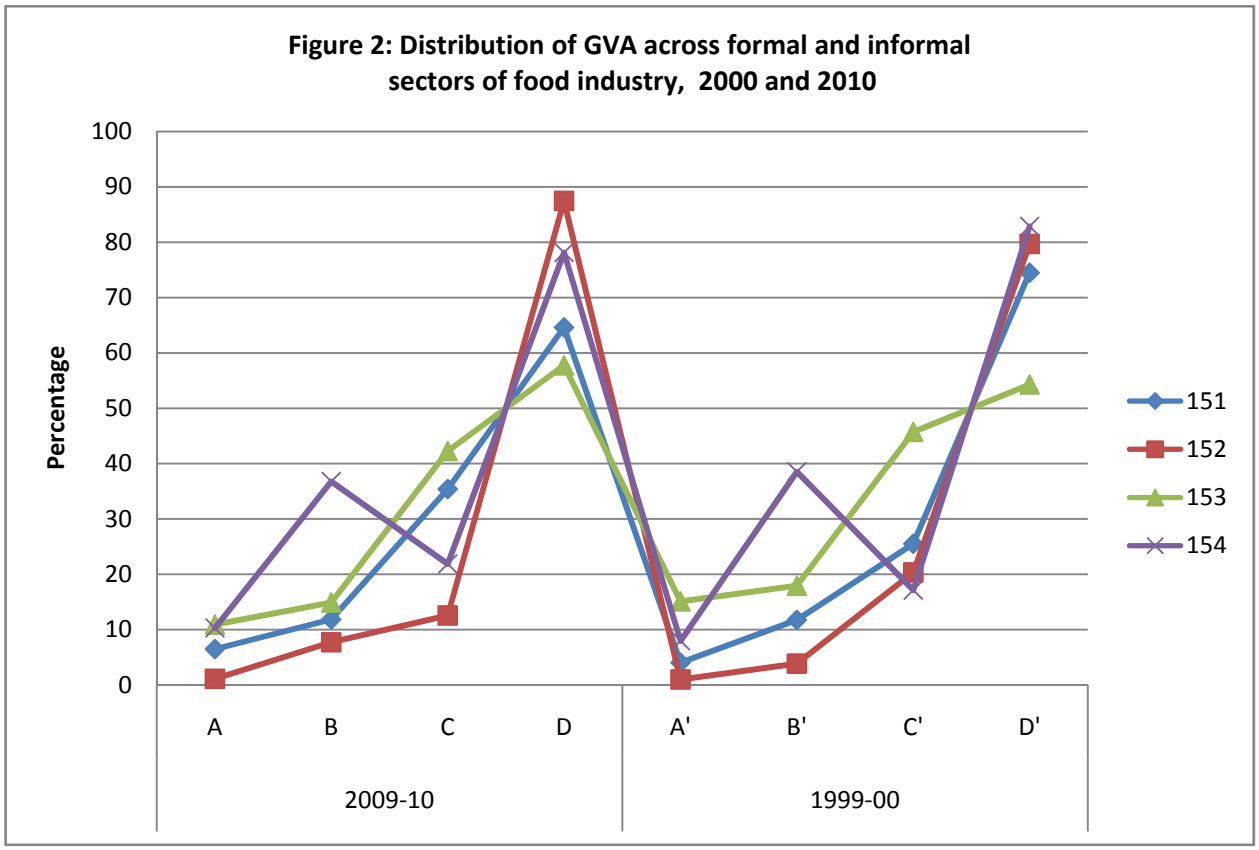
According to the Ministry of Food Processing Industries, (GOI), Indian Food Processing industry can be classified into (i) Organised, (ii) Unorganised and (iii) Small Scale industries. According to the MoFPI data, 42% of the total enterprises involved in food processing are small scale, 25% are organized and 33% are unorganized, as shown in figure 1. The above classification (organized, unorganized and small scale) is according to the MoFPI classification. However, the analysis conducted by us is based on the ASI and NSSO data. Former data represent the formal sector and the latter represent the informal sector enterprises.

Formal and Informal sectors involved in manufacture of Food

It is to be mentioned in the beginning that the relevant estimates are made primarily on the basis of unit level data provided by the ASI and NSSO. For the ASI factory level data are provided and for the NSSO enterprises level data are provided. We have also used some company level data provided by the CMIE-PROWESS. Surprisingly, the contribution of informal sector seems to be quite significant in the food industry, though much lower than that of the formal sector for the year 2010 for which latest data are available: informal sector shares around 29% of the GVA generated by the food industry. Informal sector enterprises belonging to (3digit) code 151, production, processing and preservation of meat, fish, fruit, vegetables, oils and fats, alone holds a share of 6.48% of the total GVA generated by all the formal as well as informal sector enterprises of the food industry (group 15), whereas the corresponding figure for the formal sector enterprises is 11.84% (Figure 2). Similar trend in distribution of food sector GVA between formal and informal sectors can be seen for the other 3 digit groups as well. Taking each 3-digit group separately, we can easily figure out that the share of informal sector for the codes 151, 152, 153 and 154 are 35.39%, 12.55%, 42.26% and 21.87% respectively, which is quite significantly high.

Therefore, one may argue that in the food manufacturing industry, informal sector also plays a major role. Informal sector generally acts as a sponge for the skilled workers, which absorbs all the laborers, who do not get employed in the formal sector.

Global trends show that growth in the informal food sector (IFS) is related to a spurt in urbanization and the lack of marketing infrastructure in new parts of rapidly growing cities. Rural people are migrating to cities in search of job, often settling in shantytowns with limited or no formal food markets. They sometimes migrate because they are forced off their land. In India, millions of rural people have lost agricultural land and livelihoods due to various reasons and migrate to new locations. They often use the sector as a source of cheap food as well as employment (Bouta, Frerks and Bannon, 2005). In all of these cases, former agriculturalists abandon farming and look for new employment. Low-income urban households spend 60 to 80 percent of their incomes on food (Aragrande and Argenti, 2001: 2). The informal sector is the most affordable option for these people as it provides both incomes to vendors as well as cheap food to consumers. During periods of economic crisis, the informal sector grows due to reduced formal employment prospect and people often buy food items from informal sources.



A: *%Share of the 3-digit group informal sectors in combined GVA (ASI+NSSO)of food industry(2-digit group 15)(2009-10),* ***B:*** *%Share of the 3-digit group formal sectors in combined GVA (ASI+NSSO)of group 15 (2009-10),* ***C:*** *% Share of informal sector in combined GVA(ASI+NSSO) for each three digit code in (2009-10),* ***D:*** *Share of formal sectors in combined GVA (ASI+NSSO)for each three digit code(%) (2009-10),* ***A':*** *same as A for the year 1999-00,* ***B':*** *Same as B for the year 1999-00,* ***C':*** *Same as C for the year 1999-00,* ***D':*** *Same as D for the year 1999-00.*

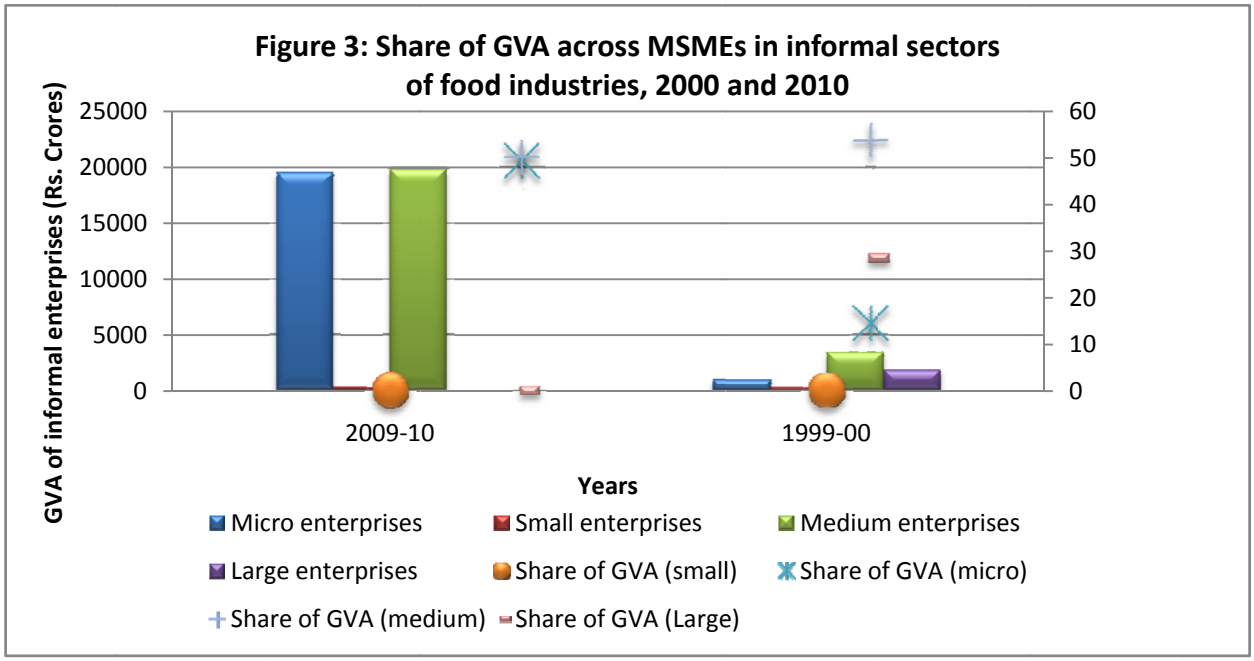
Source: ASI 19999-00 and 2009-10 and NSSO 55th and 67th Rounds

Figure 2 also makes a comparison between shares of sectors (both formal and informal) in combined GVA for the year 2009-10 with that for the year 1999-00. As we can see, the share of informal sector for the year 1999-00 was also quite significant. The most significant changes that have taken place during this span of 10 years has been (a) a considerable rise in the share of formal sector enterprises of the *'Manufacture of dairy products'* in combined GVA for Manufacture of food products as a whole; (b) For the product category, *'Manufacture of grain mill products, starches and starch products, and prepared animal feeds (153)',* the share of informal sector in combined GVA of group 15 as a whole as well as in combined GVA for particularly the enterprises involved in *'Manufacture of grain mill products, starches and starch products, and prepared animal feeds (153)'* has fallen; (c) or the product category,

'*Manufacture of other food products (154)'*, the share of formal sector in combined GVA of group 15 as a whole as well as in combined GVA for particularly the enterprises involved in '*Manufacture of other food products (154)'* has fallen.

MSMEs in Informal sectors[13]

Figure 2 clearly depicts that the contribution of informal sector in terms of Gross Value Added (GVA) in food industry is quite significant. However, it remains to be seen how, within the informal sector, the GVA gets distributed among the MSMEs.



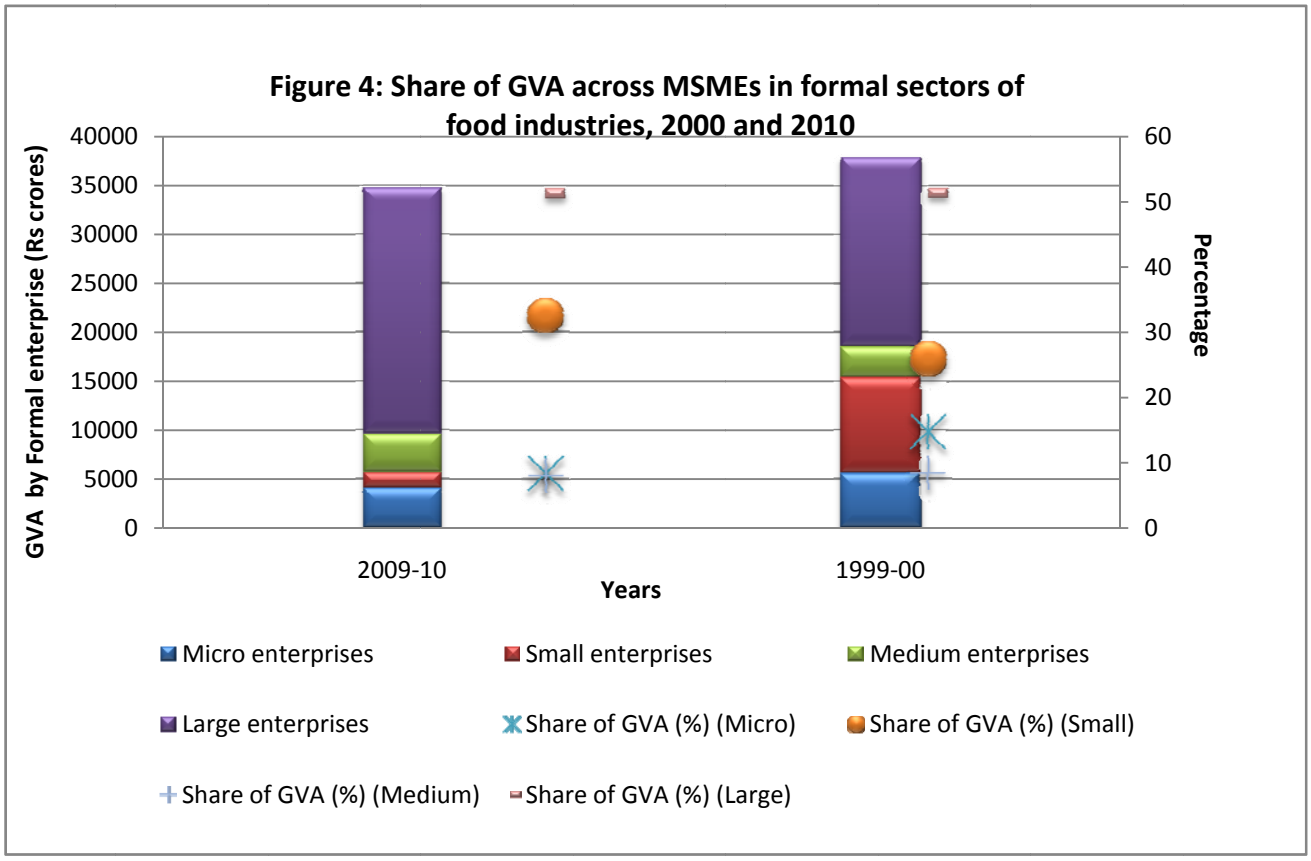
Source: NSSO 55th and 67th Rounds

As figure 3 shows, there are no large firms in the informal sector of the food industry, during 2009-10. Also, the contribution of small enterprises is negligible. The total GVA generated in the informal sector of the food industry is divided among the micro and the medium sized enterprises almost equally. The share of micro enterprises in total GVA has increased significantly between the years 1999-00 and 2009-10. For small and medium enterprises, it has dropped marginally. The large enterprises have almost completely disappeared by 2009-10.

[13] *MSMEs are defined as under:*
Microenterprises: Enterprises investing upto 25 lakhs in plant &machinery;
Small enterprises: Enterprises investing more than 25 lakhs but not beyond 5 crore in plant and machinery;
Medium enterprises investing more than 5 crore but not beyond 10 crore in plant and machinery
Enterprises investing more than 10 crores in plant and machinery are large scale enterprises.

MSME in Formal Sectors:

If we consider the Total GVA generated by the formal sectors in group 15 during 2009-10, we observe that micro, small and medium enterprises hold 8.31%, 32.52% and 7.97% share of total GVA respectively (Figure 4). Within the formal sector, the large scale enterprises contribute much more to GVA, which is around 51.21%.

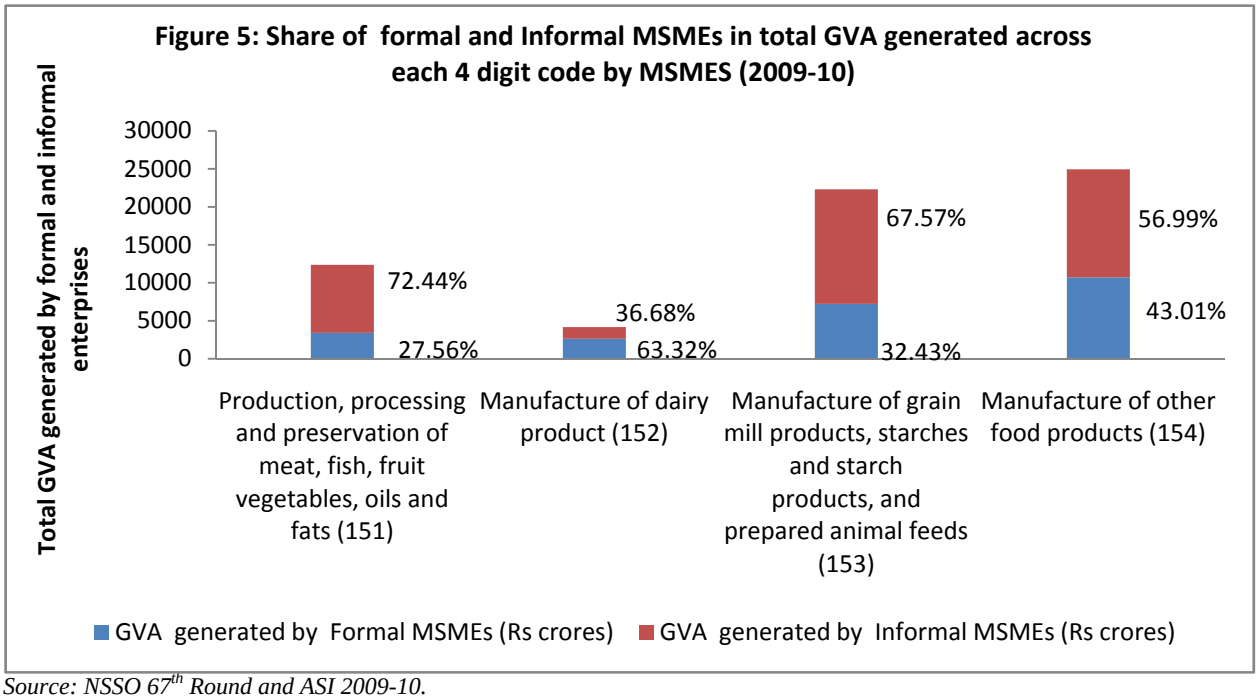


Source: ASI 1999-00 and 2009-10

Food industry is generally characterized by high volume, low margin products. Thus, operating on a large scale seems compelling, as operating on a large scale would bring in economies of scale and would therefore help the entrepreneur to reduce per unit cost. Moreover, in the formal sector, there happens to be lesser problems associated with access to credit and investment opportunities, so entrepreneurs can afford to increase their scale of operation. This could be the reason behind the biasness of contribution towards GVA in favor of large enterprises. Many larger enterprises are found in the meat products.

A fall in the demand for meat and meat products in recent years may be one of the crucial factors for the change in scale of operation. The firms competing in market for semi-processed goods such as meat packers and processors have to compete on selling prices, and thus, there seems to be a strong case for economies of scale.

Figure 5 compares the share of formal and informal MSMEs, in terms of contribution to GVA for each product category separately. Quite surprisingly, for each product category separately, the share of informal sector is not only significant (excepting one case), the share of informal sector is much higher than that of the formal sector.



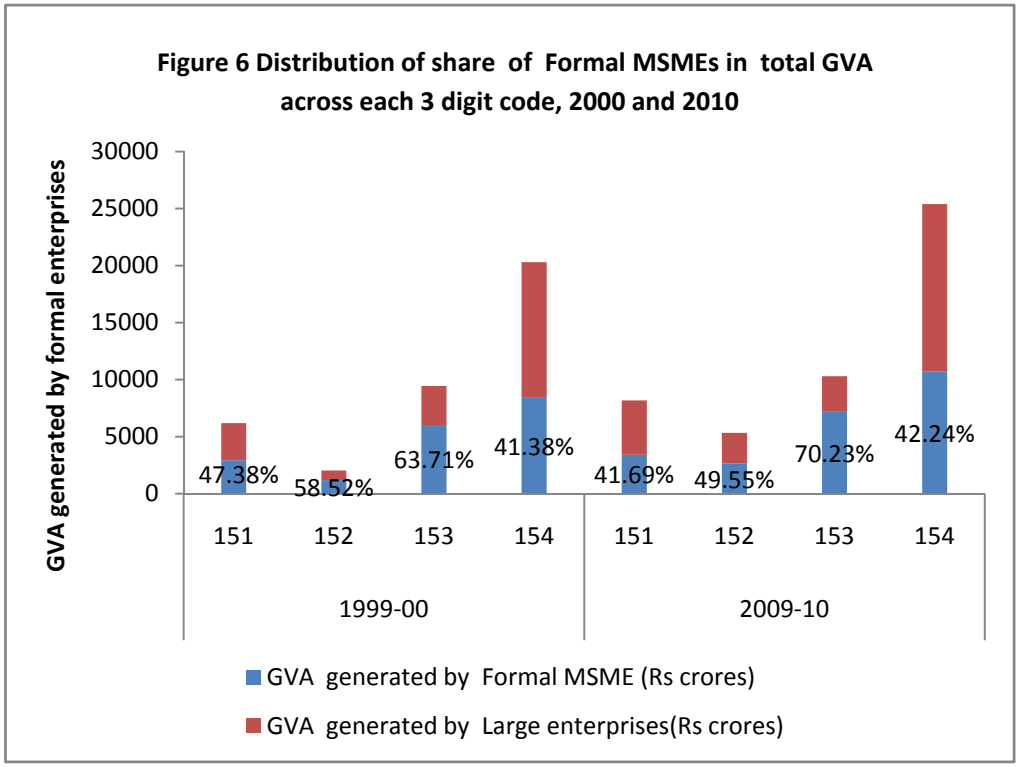
Source: NSSO 67th Round and ASI 2009-10.
Note: NSSO 67th Round data covers the year 2010-11

Evidence from around the world shows that Informal Food Sector contributes to the economy in terms of gross domestic product (GDP) and employment. The contribution of the informal sector to GDP, where such statistics are available, ranges from 13 percent in Mexico to 58 percent in Ghana (ILO, 2002: 24). IFS employment contribution ranges from 48 percent of non-agricultural employment in North Africa to 72 percent in sub-Saharan Africa (ILO, 2002: 19).

There are many different kinds of street vendors, including those at fixed kiosks and mobile stands, those who sell from vehicles (carts, bicycles, trucks, etc.) or from plastic or cloths set out on the street, and

street hawkers. They may be individuals, members of families, or even disguised workers of established businesses reaching out to new markets. Vending activity greatly varies according to gender, ethnicity and age. Municipal cooperation with the sector can provide employment to vendors while providing food and an attractive urban environment to local consumers and tourists. (FAO 2007)

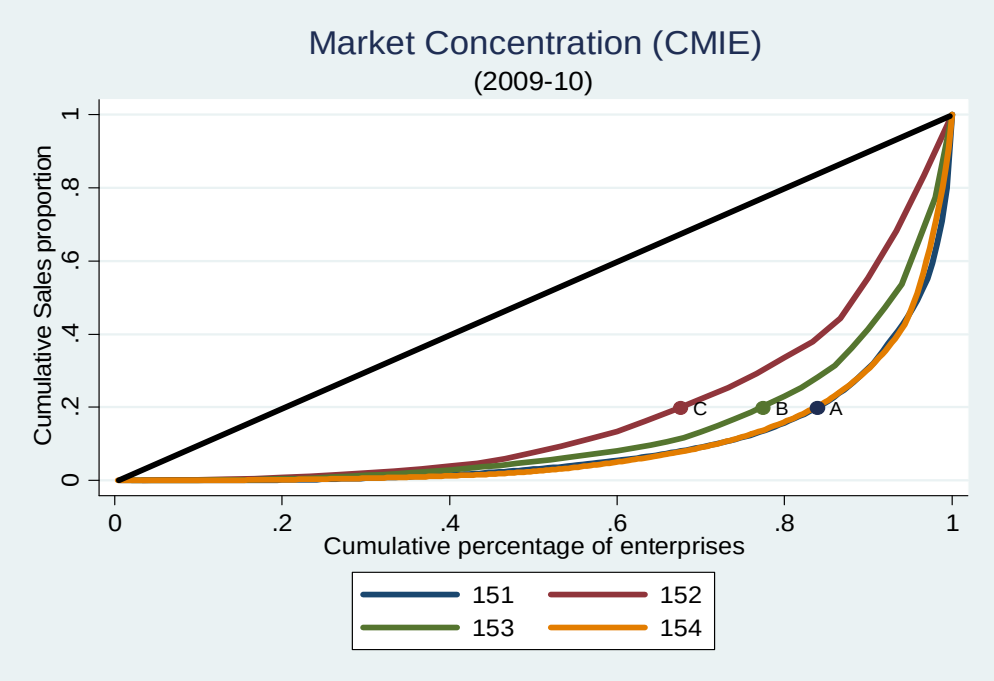
Distribution of share of formal MSMEs in total GVA across each 4 digit product category is depicted in figure 6. Among all the three digit product categories under group 15, MSMEs involved in '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds*' contribute the highest to the total GVA generated by formal enterprises across each three digit code, both, during 1999-00 and 2009-10. This is simply because the number of MSMEs involved in this category is much higher than the enterprises involved in other activities. This seems to be quite explicable, as this activity produces a large number of compounds that are used as inputs into a number of modern-day manufacturing processes.



Source: ASI 1999-00 and 2009-10

Also, it is worth specifying that the share of MSMEs to total GVA has increased for this product category viz. '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds*' by a much higher amount, as compared to the other product categories over the span of ten years. In fact for the product categories, '*Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats'* and '*Manufacture of dairy product'*, the share of MSMEs has actually fallen over the period.

Large Enterprises and their concentration



Source: Compiled from CMIR-PROWESS database

Figure-7

Figure 7 shows the Lorenz Curve depicting market concentration of enterprises as per CMIE data, which include only listed companies. One can clearly figure out just by looking at the figure that for all the product categories, the total sales among the listed enterprises is quite unequally distributed, as the curves (151, 152, 153,154) sink fairly below the line of equality. Although, there exist a large number of firms producing a sizeable volume of food products, which are not listed.

Figure 8 shows the market concentration among the enterprises covered by the ASI, which as mentioned earlier, cover only the formal sector enterprises excluding the vast number of informal enterprises. The

total GVA as per ASI appears to be highly unequally distributed, as the curves (151,152,153 and 154) sink extremely below the line of equality.[14]

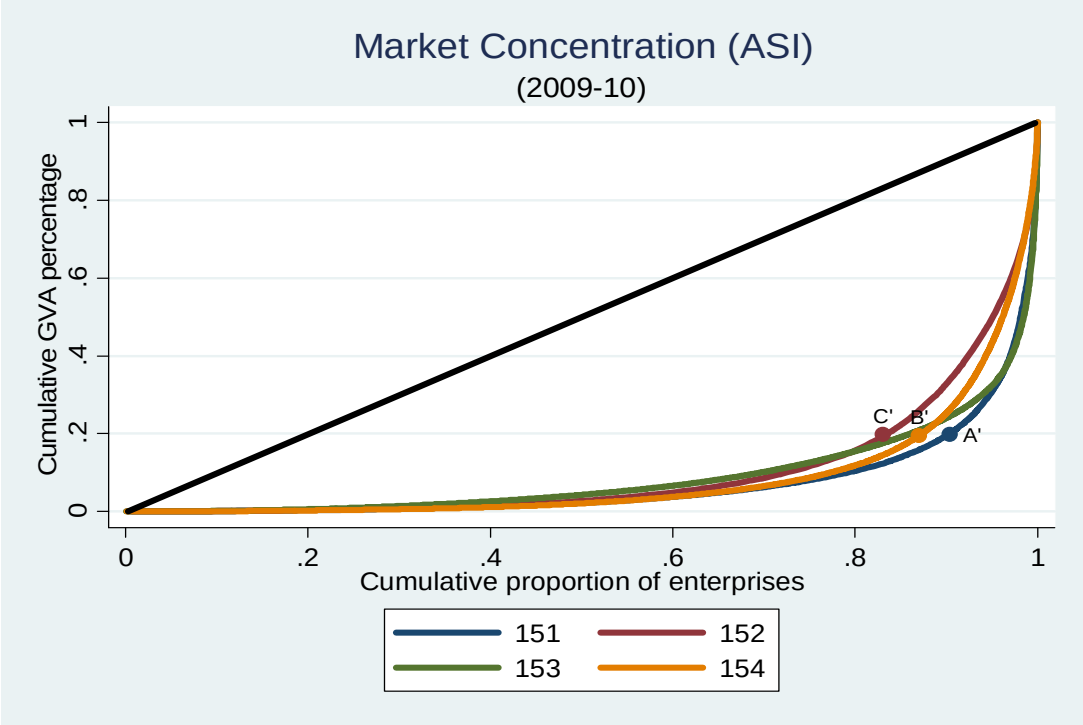
As per CMIE, under 151 and 154, lowest 85% of enterprises capture approximately 20% of the total sales *(see Figure 7, point A).* This means that just the top 15% enterprises capture around 80% of the total sales by the listed companies. Thus, under these product categories, a large part of market is being captured by just a few enterprises. Therefore, we may say that a monopolistic kind of a market structure is present for this product category as per CMIE data.

As per ASI, under the same product category viz. 151, lowest 90% of enterprises capture merely 20% of the total GVA generated under this product category, and the rest 80% of the total GVA is being captured by just the top 10% of the formally registered enterprises *(see Figure 8, point A').* This reinforces our conclusion for the enterprises under 2011, as per CMIE, that there seems to be a monopolistic kind of a market structure present for this product category, because a large part of the market is being captured by just a few enterprises.

Under 152, as per CMIE, lowest 67-68% of enterprises capture approximately 20% of the total sales *(In Figure 7, see point C).* This means that top 32-33% enterprises capture around 80% of the total sales. Thus, under the product category 152 as well, there seems to be a monopolistic kind of a market structure.

As per ASI, under 152, lowest 82-83% of enterprises capture just about 20% of the total GVA generated under this product category, and the rest 80% of the total GVA is being captured by just the top 17-18% of enterprises *(See Figure 8, point C').* This again reinforces our conclusion for the enterprises under 152, as per CMIE, that there seems to be a monopolistic kind of a market structure present for this product category, because a large part of the market is being captured by just a few enterprises.

[14] *Other measures like Herfindahl or Thail index could have been used but that would hide the nature of concentration and the shares corresponding to different proportions of top or bottom enterprises cannot be visualized.*



Source: Compiled from ASI 2009-10 unit level data

Figure-8

Under 153, as per CMIE, lowest 78-79% (approx.) of enterprises capture just 20% of the total sales *(see Figure 7, point B)*. This means that just the top 21-22% (approx.) enterprises capture around 80% of the total sales. Thus, a large part of market is being captured by just a few enterprises. Therefore, we may say that a monopolistic kind of a market structure is present for this product category as well, as per CMIE data.

As per ASI, under 153 and 154, as one may see in Figure 8, the lowest 85% enterprises (approx.) capture almost 20% of total GVA *(In Figure 2,Lorenz Curve for 153 intersects the Lorenz Curve for 154 at point B')*.

Thus, for all the product categories relating to the food industry, we can say that a large part of the organized sector market is captured by a handful of enterprises, indicating monopolistic power enjoyed by the top food enterprises of the country.

Regional variation of the performance of food industry:

We would discuss in this section the performance of food industry in different states at three digit levels for different size classes of enterprises by using ASI data during 2000 – 2010. For comparability, all the monetary figures for 1999-00 are inflated with the help of GDP price deflator for the base price of 2009-10.

Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats (151):

Andhra Pradesh outperforms other states in terms of contribution to the total GVA generated under '*Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats*' by micro enterprises, with a contribution of around Rs 66.98 crores in 2009-10, which is around 1.75 times higher than it was in 1999-00 at constant price of 2009-10[15]. Although the number of micro-enterprises involved in this category in Andhra Pradesh has declined by around 45.20%. One of the main reasons being that now, Andhra Pradesh has become the country's largest egg (6933 million eggs per annum) and poultry meat producer, contributing to about a third of country's egg and about one fifth of broiler meat production. Also, the growth rate of poultry is very high. The layer population is 500 lakhs and broilers are 1000 lakhs per annum. Apart from this, an increase in awareness of the need for balanced nutrition in recent times has led to changes in eating habits, with vegetarians accepting eggs as part of their diet. Simultaneously, there has been an increase in purchasing power, and more money is available for spending on food. With the changing food habits and increasing availability of eggs, there has been an increase in demand, which is growing at a fast rate. (Dev and Rao, 2004). Within the category, '*Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats*', in Andhra Pradesh, the largest number of enterprises are involved in '*Manufacture of vegetable oils and fats excluding corn oil'*. In this regard Gujarat ranks second after Andhra Pradesh, which is followed by Maharashtra, Tamil Nadu and Rajasthan in that order.

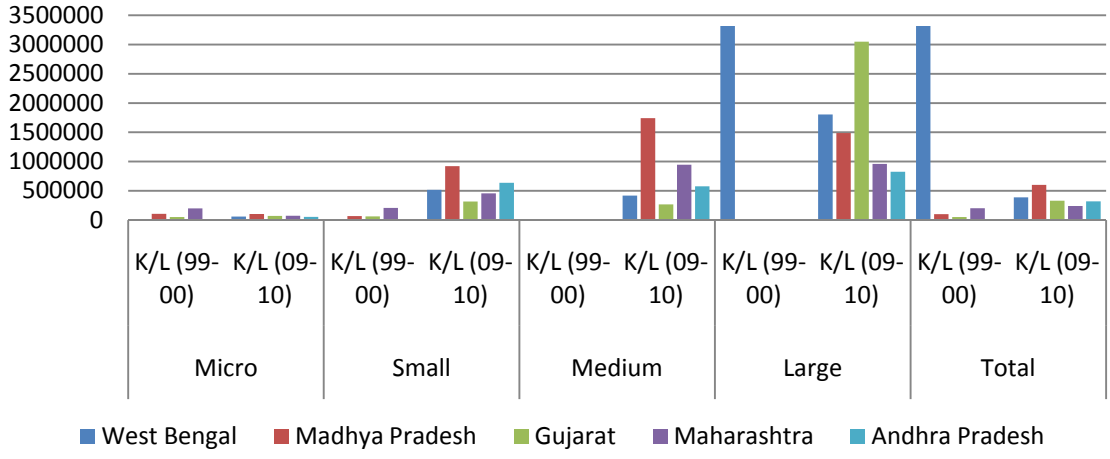
Considering all the size classes within this category, Maharashtra turns out to be the leading state, with a contribution of around Rs. 1660 crores, which is 6.53 times higher than it was in 1999-00 at constant prices of 2009-10. Such a rise in contribution is complemented by a rise in the number of enterprises within this category.

This seems to be explicable as Maharashtra accounts for a significant share (around 16%) as far as Marine fish production in the country is concerned (Maharashtra Development Report, 2007). Also, Maharashtra

[15] *GDP deflator/inflator is used to convert 1999-00 figures at current prices into 2009-10 prices.*

is the largest producer of seedless grapes (78%), banana (75%), Mandarin oranges (75%), Onion (63%). (Maharashtra State Horticulture Mission report 2005-06).

Figure 9: Regional distribution of capital intensity across size classes for product category 151 (Rs at constant 2009-10 prices) in 2000 and 2010



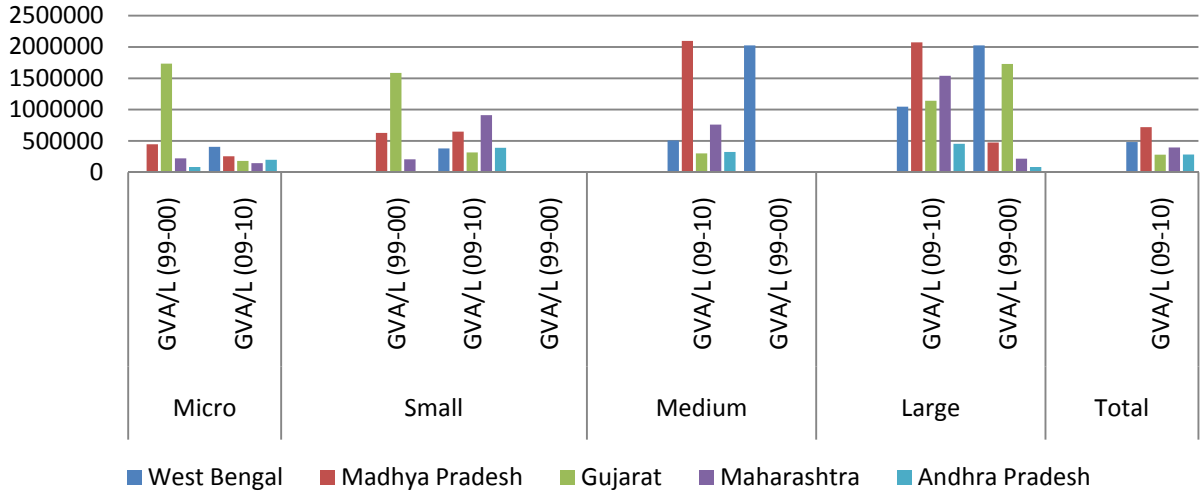
Source: ASI 1999-00 and 2009-10

Within the category, '*Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats*', in Maharashtra, the largest number of enterprises are involved in '*Manufacture of vegetable oils and fats excluding corn oil'*.

The vegetable oil industry has witnessed significant growth over the past few years and India occupying fourth largest oilseed producing country in the world, with a production of 250 million tons per annum. Since 1995, Indian share in world production of oilseeds has been around 10 percent (Subramanyachari, 2013).

Figure 9 shows the regional distribution of capital intensity across all size classes for product category 151 for the years 1999-00 and 2009-10. During 2009-10, the capital labour ratio for micro enterprises for this product category was found to be highest in Madhya Pradesh (Rs. 1,03,909), though dropped marginally by 3.41% since 1999-00. Andhra Pradesh experienced the highest increase in capital intensity over the period among the micro-enterprises. Among the small sized enterprises also, the highest capital intensity was found in Madhya Pradesh (Rs. 9,20,821). Also, M.P. experienced a considerable rise in K/L since 1999-00. So, considering all enterprises together, Madhya Pradesh has the highest capital-labour ratio (or capital intensity) during 2009-10 for the product category 151.

Figure 10: Regional distribution of labour productivityacross size classes for product category 151 (Rs at constant 2009-10 prices.)



Source: ASI 1999-00 and 2009-10

Figure 10 shows the regional variation of productivity across all size classes for product category 151 for the years 1999-00 and 2009-10. During 2009-10, the productivity (GVA/L) for micro enterprises for this product category was found to be highest in West Bengal (Rs. 4,05,431). Among the small enterprises, it was found to be highest in Maharashtra (Rs. 9,11,454), rising considerably by around 338% since 1999-00. Among the medium sized enterprises, it was found to be the highest in Madhya Pradesh (Rs. 20,97,184). Considering all enterprises together, Madhya Pradesh has the highest productivity during 2009-10 for the product category 151 (Rs. 7,20,154), a rise of 51.62% since 1999-00. For Madhya Pradesh growth of labour productivity is commensurate with the growth of capital intensity.

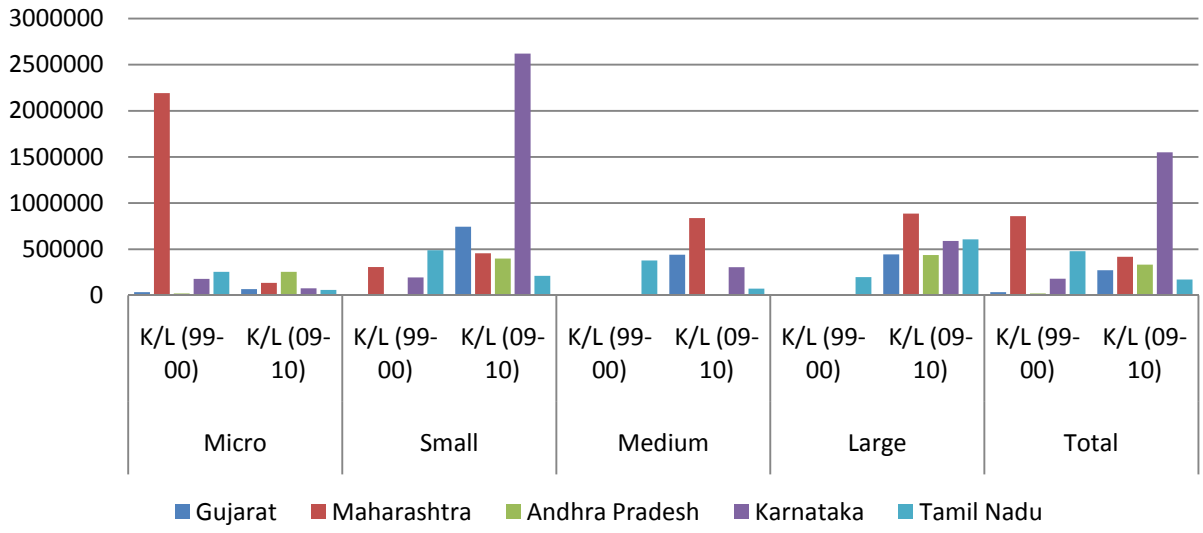
Manufacture of dairy product (152):

Under '*Manufacture of dairy product*', the highest contribution to total organized sector GVA is by Gujarat (Rs. 1100 crore), followed by Maharashtra (Rs. 921 crores), Karnataka (Rs. 518 crores), Andhra Pradesh Rs. 499 crores) and so on.

Gujarat has come out as the leading state despite the fact that the number of enterprises in Gujarat involved in this product category is not so significant. Also, it is worth specifying that during the period 1999-00 to 2009-10, the total GVA of the product group has risen 4.5 times in the state. A part of this increase may be attributed to the growth of the animal husbandry sector in Gujarat in recent years, which has resulted not only in increased milk production, but has also provided a boost to the overall agro-economy of the state. With the largest dairy cooperative in India, Amul, based in Anand, milk production in Gujarat has increased by 68% in the last decade. Gujarat's dairies currently manage a daily supply of 20 lakh litres of milk to Delhi, 8 lakh litres to Mumbai and 5 lakh litres to Kolkata, along with supplying milk powder to the armed forces [The Sunday Guardian (14/09/2013)]

The annual report of National Dairy Development Board (NDDB) for 2010-11 reveals that 96 lakh tonne of milk was collected in the year in India. Out of this, it is estimated that more than 33 lakh tonne of milk was collected in Gujarat alone.

Figure 11: Regional distribution of capital intensityacross size classes for product category 152 (Rs at constant 2009-10 prices)

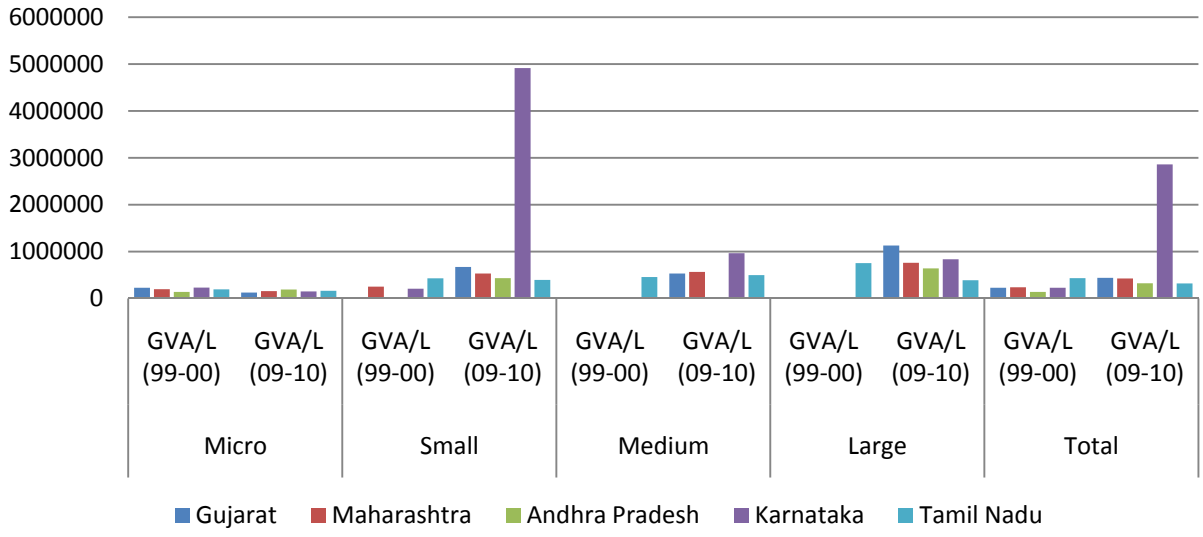


Source: ASI 1999-00 and 2009-10

Figure 11 shows the regional variation of capital intensity across all size classes for product category 152 for the years 1999-00 and 2009-10 which also indicates change during the decade. During 2009-10, the capital labour ratio for micro enterprises for this product category was found to be highest in Andhra Pradesh (Rs. 2,54,804). Among the small sized enterprises, the highest capital intensity was found in Karnataka (Rs. 26,20,962), experiencing a massive increase of 1245.70%. Considering all enterprises

together, Karnataka accounts for the highest capital-labour ratio (or capital intensity) during 2009-10 for the product category 152.

Figure 12: Regional distribution of labour productivityacross size classes for product category 152 (Rs at constant 2009-10 prices)



Source: ASI 1999-00 and 2009-10

Figure 12 shows the regional variation of productivity across size classes for product category 152 for the years 1999-00 and 2009-10. During 2009-10, the productivity (or GVA/L) for micro enterprises for this product category was found to be highest in Andhra Pradesh (Rs. 1,89,931). Andhra Pradesh also experienced the highest increase in productivity among the micro enterprises, since 1999-00 (around 36%). Among the small and medium enterprises GVA/L is found to be the highest in Karnataka in 2009-10 and also experienced very high growth over the decade. In fact, considering all enterprises together, Karnataka has the highest productivity level in 2009-10 and records the highest productivity growth during the decade for the product category 152 (Rs. 28,61,301).

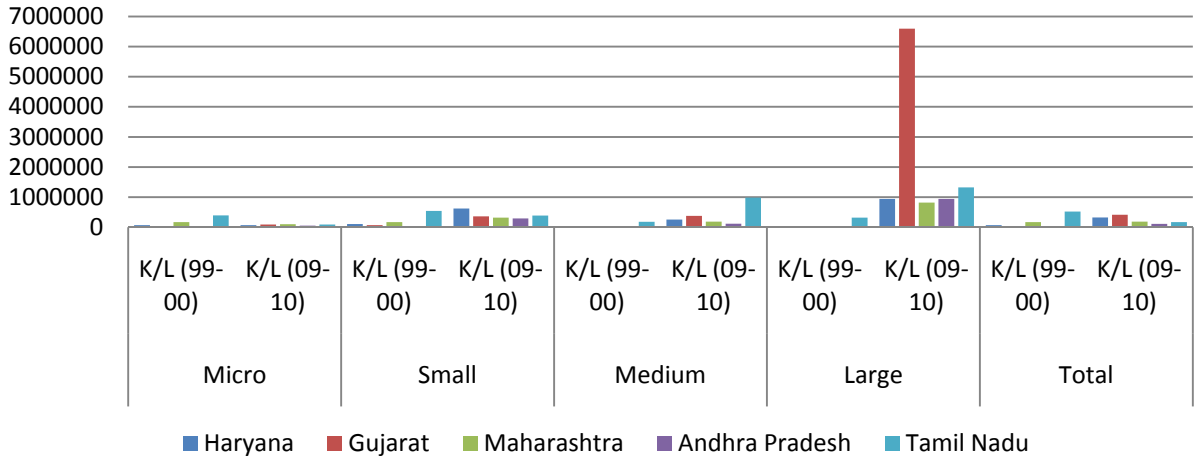
Manufacture of grain mill products, starches and starch products, and prepared animal feeds (153):

In the year 2009-10, under '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds'*, Andhra Pradesh emerges out as a leader and tops the list by contributing a total

GVA of around Rs. 2260 crores. Andhra Pradesh is followed by Maharashtra (Rs. 1220 crores) and Haryana (Rs.1070 crores).

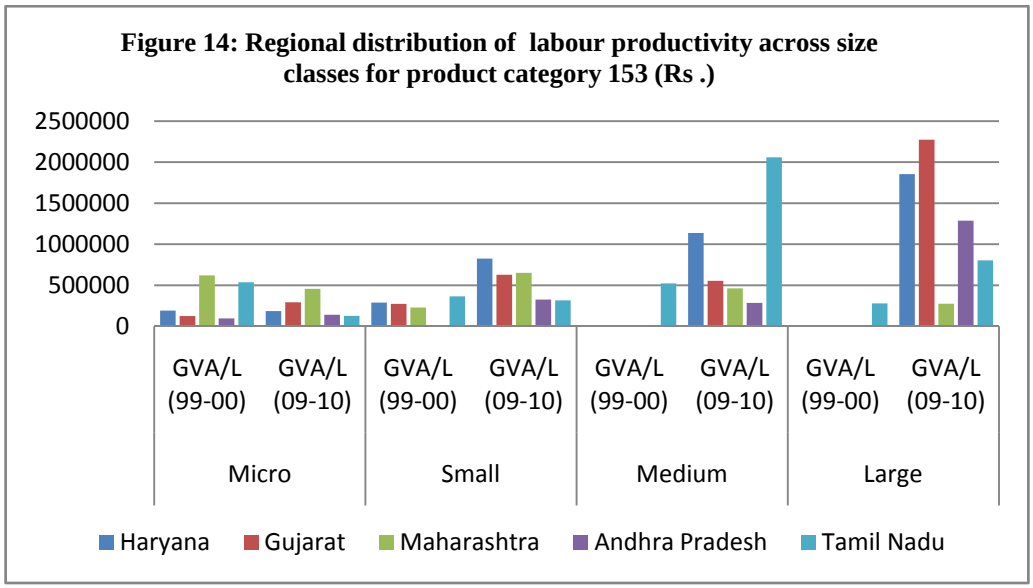
The maximum number of enterprises in Andhra Pradesh is involved in grain milling. They share around 65% of all the food processing industries in the state in both the years (1999-00 and 2009-10). Also, the net value added in grain milling is the highest in the state. Andhra Pradesh is one of the leading rice producers in the country. Rice varieties grown in the state like BPT 5204 and JGL 1798 are very popular and have high export potential. Kurnool Sonamashuri is having a lot of demand in foreign countries and ethnic populations. The state is competitive in superfine varieties.

Figure 13: Regional distribution of capital intensityacross size classes for product category 153 (Rs)



Source: ASI 1999-00 and 2009-10

Figure 13 shows the statewise variation of capital intensity across size classes for product category 153 for the years 1999-00 and 2009-10 and the change during the period. During 2009-10, the capital labour ratio for micro enterprises for this product category was found to be highest in Maharashtra (Rs. 99,230). Among the small sized enterprises, the highest capital intensity was found in Haryana (Rs. 6,21,746), an increase of about 498.36%. Considering all enterprises together, Gujarat shows for the highest capital-labour ratio (or capital intensity) during 2009-10 for the product category 153 (Rs. 4,11,971), registering an increase of more than 948%.



Source: ASI 1999-00 and 2009-10

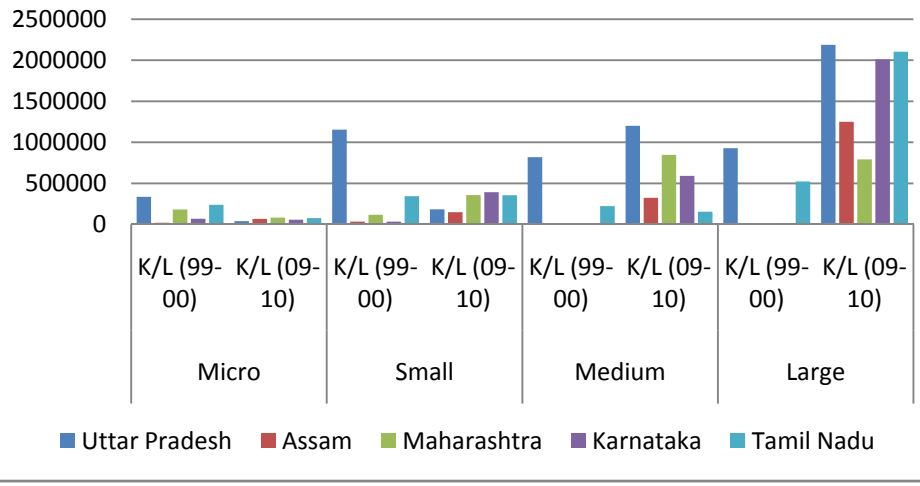
Figure 14 shows the regional variation of productivity across all size classes for product category 153 for the years 1999-00 and 2009-10 and the change during the period. During 2009-10, the productivity (or GVA/L) for micro enterprises for this product category was found to be highest in Maharashtra (Rs. 4,57,223). However, Gujarat experienced the highest increase in productivity among the micro enterprises, since 1999-00 (around 136% at constant 2009-10 prices). Among the small enterprises, GVA/L was found to be the highest in Haryana (Rs. 8,25,418) in 2009-10, recording a mammoth increase of around 186% since 1999-00. Among the medium sized enterprises, Tamil Nadu is found to have the highest productivity (Rs. 20,58,721). In fact, considering all enterprises together, Karnataka displays for the highest productivity level in 2009-10, recording a huge rise of 169.72% since 1999-00, for the product category 153 (Rs. 5,27,705) (*not shown in the figure*).

Manufacture of other food products (154):

In 2009-10, under *'Manufacture of other food products'*, Maharashtra emerges out as the leading state with respect to the contribution towards total GVA (Rs. 4490 Crores). Uttar Pradesh ranks second (Rs. 4270 crores), followed by Tamil Nadu (Rs 3420 crores), Karnataka (Rs. 2060 crores), West Bengal (Rs. 1810 crores) and so on.

One of the components of manufacture of other products is manufacture of sugar. Sugar is produced from sugarcane in Maharashtra. In recent years there has been a spurt in the production of sugar in Maharashtra. The swings in production were driven primarily by large swing in the acreage of land cultivated for sugarcane. The production of sugar is increased from 22.33 lakh tonnes in 2004-05 to 90.95 lakh tonnes in 2006-07. But it declines to 57.04. lakh tonnes in 2008-09. Again sugar production is increased to 70.66 lakh tonnes in the year 2009-10 due to yield increased as well as increase in recovery rate. (Sugar Industry in Maharashtra: An Overview).

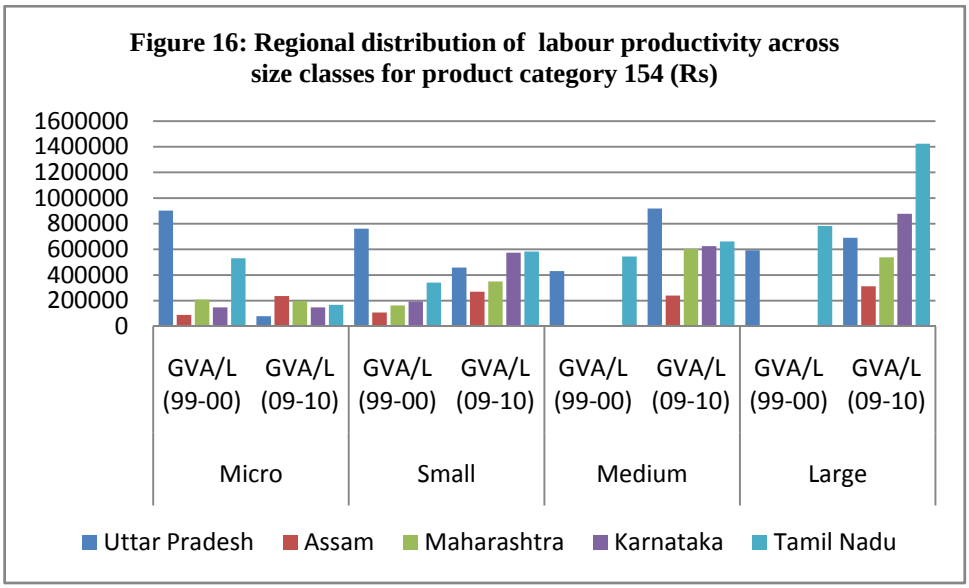
Figure 15: Regional distribution of capital intensityacross size classes for product category 154 (Rs .)



Source: ASI 1999-00 and 2009-10

Figure 15 shows the statewise variation of capital intensity across all size classes for product category 154 for the years 1999-00 and 2009-10. In the year 2009-10, the capital labour ratio for micro enterprises for this product category was found to be highest in Maharashtra (Rs. 82,110). Among the small sized enterprises, the highest capital intensity was found in Karnataka (Rs. 3,91,327). Considering all enterprises together, Uttar Pradesh has the highest capital-labour ratio (or capital intensity) during 2009-10 for the product category 154 (Rs. 5,35,594).

Figure 16: Regional distribution of labour productivity across size classes for product category 154 (Rs)



Source: ASI 1999-00 and 2009-10

Figure 16 shows the regional distribution of productivity across all size classes for product category 154 for the years 1999-00 and 2009-10 and the change during the period. During 2009-10, the productivity (or GVA/L) for micro enterprises for this product category was found to be highest in Assam (Rs. 2,36,118). Also, Assam experienced the highest increase in productivity among the micro enterprises, since 1999-00 (around 165%). Among the small enterprises, GVA/L was found to be the highest in Tamil Nadu (Rs. 5,83,351) in 2009-10, recording an increase of around 71.42% since 1999-00. Among the medium sized enterprises, it was found to be the highest in Uttar Pradesh (Rs. 9,18,889). Considering all enterprises together, Tamil Nadu has the highest productivity in 2009-10 for the product category 154 (Rs. 4,48,237) in 2009-10, recording a slender rise of 17.87% since 1999-00.

Business linkages between Large scale enterprises and MSMEs

Next we move to the business linkages (contractual arrangements) between different MSMEs and large scale enterprises. There exist four different kinds of business linkages: (1) Contracting in but not contracting out; (2) Contracting out but not contracting in; (3) Both contracting in and out; (4) Neither contracting in nor contracting out. (1) Contracting in but not contracting out: Those enterprises come under this category, which do not outsource their work to other outside firms, but do work for other enterprises. (2) Contracting out but not contracting in: This category includes those enterprises which do

not work for other firms, however do outsource their work to other firms. (3) Both contracting in and out: Those enterprises, which both, work for other enterprises as well as outsource their work to other enterprises. (3) Neither contracting in nor contracting out: Those enterprises, which neither work for other firms, nor do they outsource their work to other firms.

Annexure table 2.1 depicts the distribution of firms across different business linkages across all size classes. One can easily deduce that out of 1350 organised sector (ASI) micro enterprises involved in *'Production, processing and preservation of meat, fish, fruits, vegetables, oils and fats (151)'in 2009-10*; 758 (around 77.82%) contract in but do not contract out. Out of 216 microenterprises involved in '*Manufacture of dairy product (152)',* 152 (70.37%) contract in but do not contract out. Out of 6149 micro enterprises involved in '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds (153)'* 3918 (around 63.72%) contract in but do not contract out, and out of 2309 micro enterprises involved in *'Manufacture of other food products'(154),* 1505 enterprises (around 65.18%) contract in but do not contract out. The corresponding data for 1999-00 suggests that there is not even a single firm lying under the category contracting in but not contracting out.

A large number of small sized enterprises are involved in contracting in but not contract out: 499 out of 725 organised (ASI) enterprises under code 151, 184 out of 394 enterprises under code 152, 1513 out of 2,389 enterprises under code 153 and 1127 out of 1571 under code 154.

This fact is explicable as most of the large enterprises depend on these local micro and small enterprises, as buying inputs and raw materials from these small enterprises can help the larger firms cut costs and increase flexibility. It can increase quality, traceability and sustainability of supply.

A similar trend is visible for the medium as well as the large enterprises. A majority of enterprises under each product category lie under '*Contracting in but not contracting out'*.

This scenario seems to be logical, considering the fact that India has become one of the favourite destinations of outsourcing internationally in recent years. Releasing a study done by CII & Yes Bank on "The Indian Processed Food Industry: A Diagnostic Review of Opportunities and Challenges," Subodh Kant Sahai, minister for food processing industries, had said that "The food processing sector had the potential to become the outsourcing hub for the world and India would be feeding the world in years to come". [16]

[16] *See also Mukherjee et al (2013) for a discussion on the potential of non-alcoholic beverage sector (**Arpita Mukherjee, Debolina Mukherjee, Deboshree Ghosh and Divya Satija (2013) Food Processing Industry in India:** Unleashing the Potential of the Non-alcoholic Beverage Sector, ICRIER.)*

Age wise pattern of contractual linkages

The pattern of contractual linkages based on age groups substantiates the fact that a very high proportion of the young enterprises contract in but not out. This seems to be quite obvious. During the initial stages of operation and before they actually begin production on their own, the entrepreneurs might want to polish their (and their workers') skills. Also, initially, they might not have sufficient capital and funds so as to start production right away, or even access to preferred market (particularly true for micro enterprises).

One can estimate the age-wise distribution of contractual linkages for micro, small, medium and large enterprises using Annexure tables 2.2a, 2.2b, 2.2c and 2.2d respectively across each of the three digit product category.

Considering micro enterprises first, out of the total firms which have started not more than 10 years ago, in the product category '151', 64.07% firms, contract in but not out; for the product category152 around 67.14% firms contract in but not out, for the product category '153' 66.86% firms contract in but not out and for the product category '154' 66.25% firms contract in but not out. It needs to be mentioned that around 15-16% of the micro enterprises are found to be upto 5 years age in both the years, 1999-00 and 2009-10, although in the latter year it is slightly higher. Given the slowly declining trend in the number of micro enterprises and the age distribution of the micro enterprises in 2000 and 2010, the churning rate appears to be moderate,

Now considering the small enterprises, out of the total firms which have started not more than 10 years ago, for the product category *'151'* around 73.71% firms contract in but not out, for the product category *'152'* around 53.67% firms contract in but not out, for the product category *'153'*, 67.42% firms contract in but not out and for the product category *'154'*, 66.95% firms contract in but not out.

There are too few medium enterprises, which have started not more than 10 years ago, for any analysis to be drawn.

In case of large enterprises, out of the total firms which have started not more than 10 years ago, for the product category *'151'*, around 65.06% firms contract in but not out, for the product category *'152'*, 46.67% firms contract in but not out, for the product category *'153'*, around 66.07% firms contract in but not out and for the product category *'154'*, 60.61% firms contract in but not out.

Thus, we may infer that most of the enterprises, when young, contract in but not contract out. As this scenario is true for all sized enterprises, viz. micro, small and large, therefore, we may speculate that these enterprises might be contracting in from some enterprises lying outside food industry.

Also, as the last columns of above mentioned tables show, for most of the product categories, of each size, there are few enterprises which were started more than 31 years ago. This means that most of the enterprises are young and many of them would survive and grow larger.

Productivity and Capital Intensity of MSMEs

The productivity, measured in terms of value added per labor is found to be much higher in large firms as compared to the MSMEs in formal sector (figure 17a), which is quite obvious. Low productivity in MSMEs may be due to various reasons such as the use of more labor intensive techniques instead of up graded machine technology. MSMEs, particularly micro and small ones, often do not have access to up dated technologies, as a result continue manufacturing goods using conventional and labor intensive technologies. MSMEs also fail to switch to modern technologies due to their inability to mobilize sufficient funds. MSMEs are mostly owned and managed by single individuals or family members many of whom are ignorant about the IPR and trade related policies, which might lead to a reduction in level of productivity of the enterprises. Concentration of demand for products and supply of raw materials (with adverse terms of exchanges), delay in payments and wide fluctuation of prices may also lead to low productivity of MSMEs.

Further, the capital per labor or capital intensity is very low in case of MSMEs as compared to large firms (Figure 17a), which is quite obvious too. The MSMEs generally remain devoid of enough funds as well as skilled workers, to be able to afford and maintain the required amount of capital, and therefore fall short in terms of capital labour ratio.

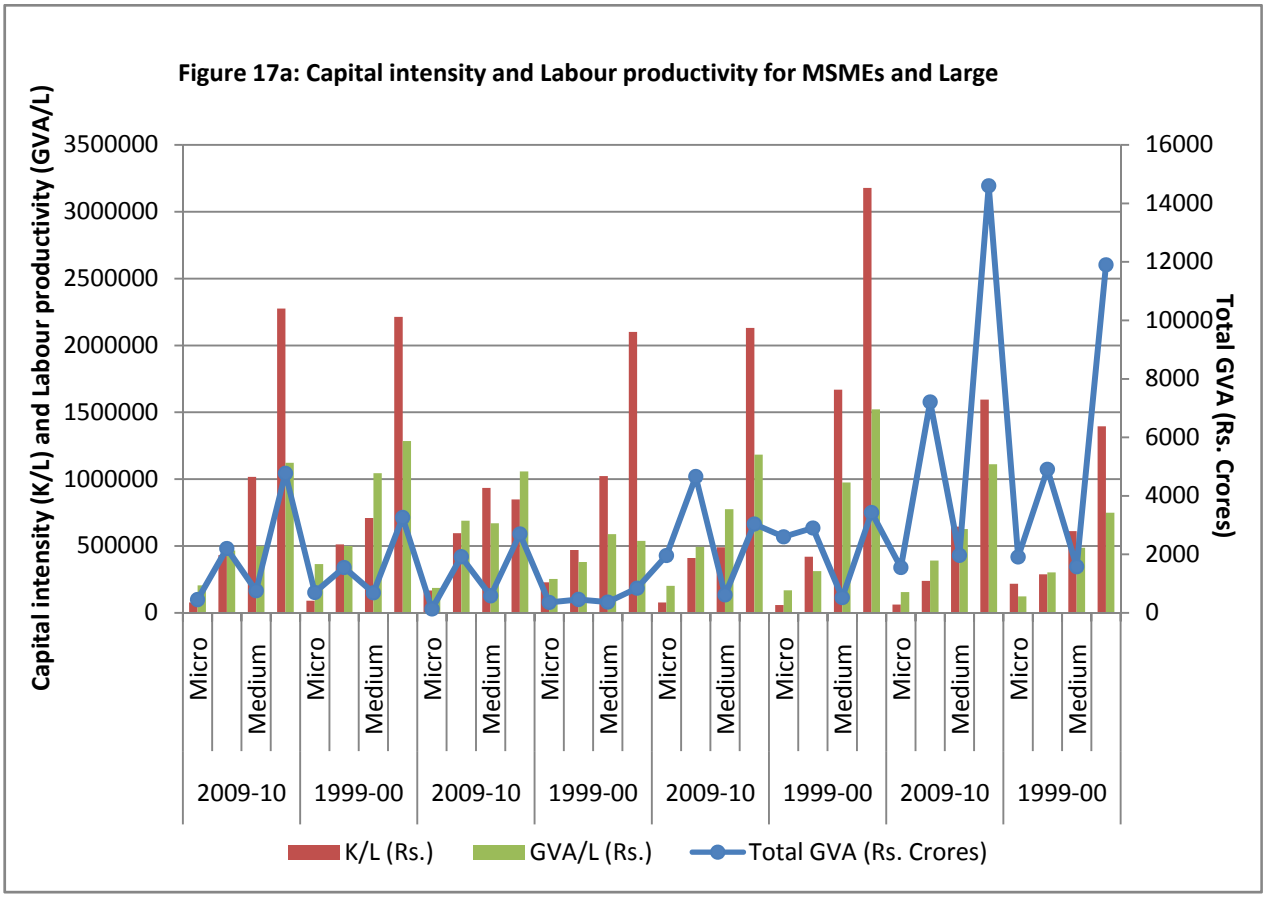
While firms in India have remained small, a large share of India's manufacturing has been in sectors that usually require a larger scale of production. Moreover, production has tended to be particularly capital-intensive, with the labour share in value added at about a quarter and falling, compared with a share of nearly two-thirds in many OECD countries. [Dougherty et. al (2009)]

It may be observed in figure 17a, that for micro enterprises, the total GVA has fallen considerably between 1999-00 and 2009-10 for all the product categories. Also, for the micro enterprises involved in the product categories, '151', '152' and '154', the capital intensity has fallen during the period. In fact, for the micro enterprises involved in '151' and '152', even the labour productivity has fallen.

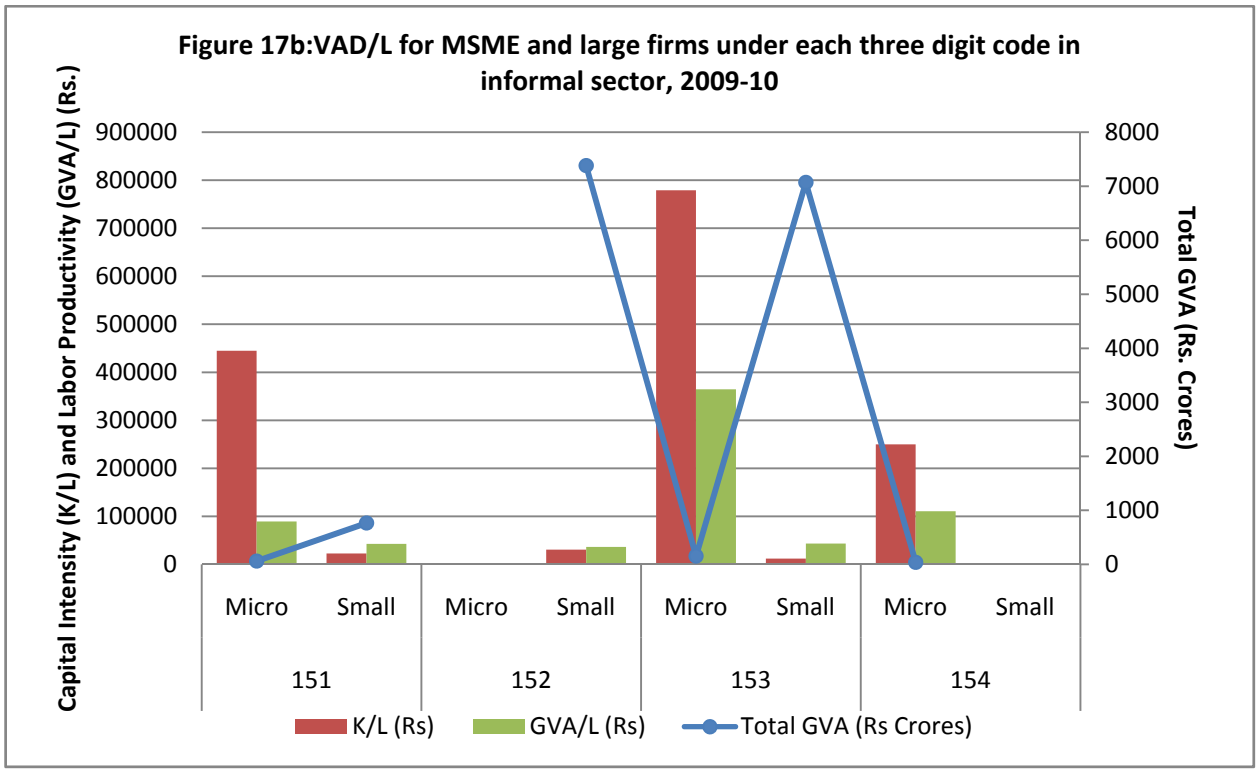
As we can see, for all the enterprises, apart from micro enterprises, the total GVA has risen between 1999-00 and 2009-10, irrespective of size and the product category to which they belong (except for the large enterprises involved in '153', which show a reduction in total GVA over the period).

This seems to be a positive sign as the total increase in production in the food industry is getting distributed among the small, medium and large enterprises.

If we look at the informal enterprises in the food industry, there are no medium and large enterprises existing. In fact, for the product category, 152, we may find only the micro-sized enterprises (figure 17b).



Source: ASI 1999-00 and 2009-10



Source: ASI 2009-10

Productivity of Formal enterprises and business links

Annexure table 2.3 shows GVA per labor (or labor productivity) and capital per labour (or capital intensity) of formal micro, small, medium and large enterprises, under each business linkage and across each product category.

It is worth noting that the labor productivity (GVA/L) of micro sized enterprises is highest for the ones, which both contract in and out, irrespective of the product category in which they are involved[17]. This might be because of the fact that 'contracting in' may provide the workers with considerable exposure to the market and technology and may increase their efficiency by making them more professional in their approach and thereby augmenting labor productivity. Contracting out, on the other hand, may facilitate greater specialization as it allows the enterprises to specialize in producing the goods in which they are relatively more productive and contract out a part of their prospective output to other firms. This leads to an increase in labour productivity.

[17] *For product category '154', the productivity of micro sized enterprises under 'Neither contracting in nor contracting out' is marginally higher than those under 'Both contracting in and contracting out'. Here we ignore this minute difference.*

The labor productivity (GVA/L) of micro sized and small sized enterprises involved in product category, *'151'* lie under *'Both contracting in and Contracting out'*, whereas, the medium and large sized enterprises in the same category lie under, *'Neither Contracting in nor Contracting out'*.

The capital intensity of small, medium and large sized enterprises involved in product category *'151'* is highest for the ones which lie under *'Contracting in but not contracting out'*, whereas for the micro sized enterprises involved in '151', K/L is highest for the ones belonging to '*Contracting out but not Contracting in'*.

This observation is quite explicable. Product category *'151'* includes production, processing and manufacture of meat, fish, fruits, vegetables, oils and fats. This requires huge storage capacity, especially in case of meat and fish which requires cold storage. Since, for the micro firms, it is often costly as well as difficult in terms of infrastructure, to manage the process all by itself or taking orders from other firms; therefore, they may not contract in. On the contrary, they may outsource some of their own potential output to other larger firms, and therefore are able to deal with the required amount of output without having to hire many laborers. This may result in a high level of capital labor ratio.

As opposed to this, the relatively larger firms (small, medium and large), with the relatively better quality infrastructure available to them, may find it cost efficient to not only manage their own production process themselves, but also work for other smaller enterprises.

Export Scenario based on ASI units, 2009-10

Detail figures related to exports are displayed in the annexure tables 2.4a, 2.4b, 2.4c and 2.4d. The first one (annexure table 2.4a) shows the contribution of each product category in the food industry towards exports. It may be seen that the highest contribution is made by the product category *'151'* (36%).

India mainly exports Crustaceans and fish frozen (whole) in the international market and its leading trade partners are USA, Japan, Spain, China and UK. In recent times, the export of Fish fillets and pieces, fresh, chilled and frozen and Fish cured or smoked is experiencing a growth of more than 30% per annum. *[Productivity and Competitiveness of Indian manufacturing: Food Processing Sector, (ESG), NPG]*

In addition, as a result of some sub-sector specific policies being adopted recently, exports of fruits and vegetable products and marine fish products are freely allowed. The product category *'152'* contributes very little to total exports. This category includes manufacture of dairy products. Exports of dairy products have shown a massive decline in recent years.

Miscellaneous preparations such as coffee and tea essences and concentrates, mixed sauces and seasonings, and ice-creams showed high export growth and wine and beverages exports grew significantly. [India's Free Trade Agreements and Micro, Small and Medium Enterprises: A Case study of the food processing industry]. This fact is visible, as the product category *'154'* shows a significant share in exports.

Annexure Table 2.4b gives us the contribution of firms in total exports for each three digit code. The contribution by MSMEs to total exports is quite significant for the product categories 151, 153 and 154. As shown in the table, contribution to total exports by MSMEs for the product category *'151'* is 54.97%. On the other hand, for the product category *'153'* it is 29.34%, while for the product category, '154', the contribution by MSMEs is 70.76%.

Now, Annexure table 2.4c shows the distribution of firms across different business linkages and their relative exports across size classes. For the product category *'152'* there are no micro or medium sized exporting enterprises. For the product category, *'153'*, among the MSMEs, the exports were highest for the ones which contract in but don't contract out, this high contribution may be attributed to the fact that under this product category, largest number of exporting firms also fall under 'Contracting in but not contracting out'. This may be due to the fact that during the initial stages, when the firm is small in size, it may be very difficult for it to deal with the international firms directly. Contracting out a part of their potential output to the international firms may involve various challenges like, setting of wages of the international workers/ piece rates, various standards of the products, as initially, entrepreneurs may have very little idea about the situation of the global (labor) market. Moreover, in the *'Manufacture of grain mill products, starches and starch products, and prepared animal feeds'* particularly, there is very little scope for product differentiation, which provides the importing international firm with a range of options to choose from. Thus, in case an international firm finds that a domestic firm is dependent on other firms for a part of their output (i.e. contracting out) it may decide against placing the order of export to that firm and may choose some other firm, from a bunch of firms, selling more-or-less, a similar kind of product. On the other hand, for the large enterprises, the exports were highest for the ones which both contract in and out.

Annexure table 2.4d shows the regional distribution of exports by micro, small, medium and large enterprises. Among the exporting micro enterprises in *'151'*, around 34.71% are located in Haryana. As discussed earlier, there is no exporting micro or medium enterprises in the product code '*152*'.

Among the exporting small enterprises belonging to *'151'*, around 32.38% are located in Maharashtra, of those belonged to '*152'*, 100% (all) are located in Uttar Pradesh, of those belonged to '*153'*, 30.81% are located in Uttar Pradesh and of those belonged to *'154'*, 47.92% are located in Kerala.

Among the exporting medium enterprises in *'151'*, 83.72% are located in Maharashtra.

Among the exporting large enterprises in *'154'*, 78.98% are located in Karnataka.

The above observation suggests that some sections of the food industry have witnessed substantial rise in capital intensity and labour productivity and also contributed to exports. Some states have come up as dominant players in selected segments of the food industry. FDI, foreign collaboration, exports of food products and even imports of technology contributed to innovations in the sector. The next chapter would analyse the innovativeness of the various manufacturing enterprises involved in food industry.

Chapter 3

Technology innovation in Food industries during 2000-2010

This chapter makes an analysis of the technology levels of the various types of enterprises of the food industry and the pattern of innovation made by them during the decade from 2000 to 2010. Technology innovations are usually associated with changes in the level of technology. On many occasions it becomes difficult to directly measure/capture changes in technology or innovations. There are however several ways of measuring the technology levels; such measurement is informed by and also determined by for example, what type of machinery is being used and hence what level of embodied knowledge is employed; what are the components with which the machine as well as the product is made of, what are the material inputs, and labour inputs or the skills engaged and what kind of energy source or motive force is required to operate the machineries, and what are the outcome of the use of the technology embodied machine/product in terms of output per labour or per unit of material inputs, what is the grade of product quality, and the export performance or market share of the products or types of contractual or quasi-contractual linkages of the enterprise.

Methodology of indexing technology

Biswas and Banerjee (2014) has developed a simplified approach to measure technology levels of enterprises, distribution of enterprises across technology levels for industry, sector, region or size class of enterprises in a given year.(15) Temporal changes in the distribution, as suggested by Biswas and Banerjee (2014), would reflect innovations. Methodology used by these authors to measure innovations is summarized below:

> The relevant parameters for identifying technology level of manufacturing units have been clubbed into three broad groups; namely (1) those related to inputs, (2) those related to capital and (3) those related to output.
>
> (1) Input related parameters as available from our dataset, are about the extent of the use of white collar managerial and supervisory staff, contract labour, use of imported inputs and wage-rates paid to workers; (2) similarly, the capital related parameters are about the

extent of land and building assets, capital per unit labour, number of manufacturing units owned by a firm and share of productive non-land assets such as plant and machinery, tools and equipment, ICT capital etc in total assets; and (3) output related parameters are about output per labour, value added per labour, contract work, export orientation of production and sale of others' products.

Each parameter represents a scale for technology commitment levels and on one such point of this scale resides the value of the particular dimension of technology of the manufacturing unit/ enterprise under consideration. It is being assumed that since all parameters reflect investment, which is homogeneous and therefore scalar additive, the summation of such values of all the parameters constituting a group, for a manufacturing unit, denotes the unit's technology commitment level for the particular group of technology indicators. Thus each group of technology parameters represents a pillar of technology and the pillar is indexed corresponding to seven levels of technology, namely, very low, low, lower medium, medium, higher medium, high and advanced technologies. Combining the values of all the three pillars, namely input pillar, capital pillar and output pillar, and through simple averaging a consolidated index of technology is formed4. For the consolidated index also the same seven point technology scale is used. These three pillars of technology together with the consolidated index help us to understand the status of the present level of commitment to technology and the degree of technological advancement that has happened in Indian manufacturing over a decadal period.

1. Input Pillar: This index is created taking into account the share of contractual labour, share of employees involved in managerial work and supervision, share of imported input in a factory unit and the wages per employee. For each of these four parameters appropriate scale is set denoting technology levels. A detailed description of the scaling is given below:

i. ***Share of contractual workers:*** It measures the percentage of total workers employed through contractor, and not directly by the factory. An index denoting technology level is assigned to a range of values. An enterprise with no contractual worker is assigned a value of 7; an enterprise with a share of contractual workers up to 15% is assigned a value of 6, in the range 15-30% is assigned a value of 5, 30-45% a value of 4, 45-60% a value of 3, 60-80% a value of 2 and more than 80% the value of 1. An enterprise with fewer contractual workers is expected to be technologically more advanced than an

enterprise with larger number of contractual workers because in general an advanced technology would require machine/process specific skill/ knowledge and hence retained longer-tenured and thus more dedicated skilled workers. Often advanced technology reduces demand for labour hands while however, knowledge-intensity increases and such knowledge/skill are unlikely to be available in a local spot market readily. Shorter job duration or frequent change in job does not allow a worker to accumulate enough work experience or skills. Further, with retained long-term worker an enterprise pays for and most often, higher wages including on social security. In other words, an enterprise commits in general higher investment on regular/permanent worker. Thus higher the level of technology of an enterprise, the higher would be the percentage share of permanent employees.

ii. ***Share of employees involved in managerial work and supervision:*** It measures the percentage of total employees involved in non-shop floor managerial and supervisory work or the white collar jobs of a factory unit. Different indices are assigned to different range of values in this case as well. Enterprises with a share of white collar employees up to 10% of employees are assigned an index value of 1, with a share of 10-20% a value 2, 20-30% a value 3, 30-40% a value 4, 40-50% a value 5, 50-60% a value 6 and more than 60% a value 7 is assigned. An enterprise using advanced technology is likely to emphasise on design, quality control and maintenance, and marketing and distribution, servicing including provisioning for spare parts of products, accounting and finance, and thus such an enterprise employs more designers, supervisory, managerial and marketing staff. Managerial and supervisory staff are important for coordination and smooth functioning of various departments of the manufacturing unit.

iii. ***Share of imported inputs:*** It measures the proportion of imported inputs in total inputs used by a factory unit. An enterprise with a share of imported inputs up to 10% is assigned an index value 1, with a share of 10-20% a value 2, 20-30% a value 3, 30-40% a value 4, 40-50% a value 5, 50-60% a value 6 and more than 60% a value 7 is assigned. An enterprise with a higher share of imported input is more likely to produce specialized high quality product by using high technology.

iv. *Wage per employee:* This figure is obtained as the ratio of the total amount of wages paid in an enterprise and the total number of employees in the enterprise in a year. Indices of technology levels are assigned to enterprises corresponding to the different range of values of this parameter. An index 1 for values less than Rs 25000, 2 for values between Rs 25000-50000, 3 for Rs 50000-100000, 4 for Rs 1- 2 lakh, 5 for Rs 2 -5 lakh, 6 for Rs 5 -10 lakh and 7 for values above Rs 10 lakh. A firm which is technologically advanced is likely to employ more skilled people and pay higher wages. Higher wage also reflects higher productivity.

Input Pillar: It may be seen the four different parameters indicate technology in different ways and although all the parameters may not be equally important while denoting technology level of different size classes or industry sectors, we have combined them by taking their simple average. Combination of the four parameters, however more accurately captures the technology commitment level in so far as the use of inputs is taken into account. Thus, simple averaging the values of all the four indices for a manufacturing unit would provide the group index for the input technology commitment pillar. For convenience, we set scales from 1 to 7 as follows: average value 1 is very low technology (level 1); average value more than 1 up to 2 is low technology (level 2), more than 2 up to 3 is lower medium technology (level 3), more than 3 up to 4 is medium technology (level 4), more than 4 up to 5 in higher medium technology (level 5), more than 5 up to 6 is high technology (level 6) and above 6 is advanced technology (level 7).

2. Capital Pillar: This index is created taking into consideration the values of land and building assets of a firm, share of plant & machinery, tools & equipment, ICT capital etc in total asset, number of factory units owned by the firm and capital per unit labour. For each of the four parameters relevant technology scale is assigned. A detailed description of the scaling is as under:

i. *Land and Building assets of a firm:* Possession of high valued land and building assets shows creditworthiness or solvency of the enterprise capable of installing latest machinery and equipment, and investing in R&D activities leading to modernization of technology. Thus larger the value of land and building, the larger is the probability of installing higher technology equipment. Corresponding to different ranges of values of land and building assets unique index numbers have been assigned to denote commitment

to the technology level. An index value of 1 is assigned to land and building asset values less than Rs 1 lakh, 2 for values ranging between Rs 1–5 lakh, 3 for values ranging between Rs 5-25 lakh, 4 for values between Rs 25-100 lakh, 5 for values from Rs 1-5 crore, 6 for values between Rs 5-25 crore, and 7 for values exceeding Rs 25 crore.

ii. ***Capital per labour:*** Value of productive assets, consisting of plant and machinery, tools and equipment, etc, per unit of labour indicates capital intensity, and higher is the capital intensity the higher is the expected level of technology. Higher capital intensity is generally assumed to be associated with higher labour productivity. Index values are assigned corresponding to different ranges of the productive assets per labour. Index value of 1 is assigned for capital labour ratio upto Rs 25000, 2 for Rs 25-50 thousand, 3 for Rs 50-100 thousand, 4 for values ranging between Rs 1-5 lakh, 5 for values between Rs 5-25 lakh, 6 for values between Rs 25-100 lakh and 7 for values greater than Rs 1 crore. Here capital includes all the fixed assets other than land and building.

iii. ***Number of factory units:*** An enterprise with more than one operating factory units is usually large in size, and cater to several markets and therefore, in Schumpeterian sense of the technology which includes organizational and managerial knowledge, such an enterprise is likely to be committed to advanced technology. This might be also due to the fact that such an enterprise uses economy of scale with upgraded technologies and is likely to manufacture better quality and larger quantity or large varieties of products catering to larger markets facing increased competition. Index values corresponding to number of factory units have been created as follows: Index 1 is assigned if number of factory units is 1, index 2, 3, 4, 5, 6 are assigned to firms having 2, 3, 4, 5 and 6 factory units respectively and index 7 is assigned to firms with factory units equal to or greater than 7.

iv ***Share of non-land assets in total assets:*** The percentage share of non land assets in total assets also proves to be useful in assessing the technological level of a manufacturing unit. Compared to asset category of land and building whose value does not increase owing to labour or technology, other assets like plant and machinery, tool and equipment, ICT capital, and other instruments whose value can be enhanced with intensified labour and technology, the latter group of asset is industrially productive and

the technology is embodied in these assets rather than in land and building. Thus a firm with a higher share of non land assets is assumed to be better off technologically than its counterpart. Different index values were assigned to the share of non land assets in total assets. An index value of 1 is assigned for the factory unit/enterprise with a share of non land assets in total assets less than 15%, 2 for the shares between15-30%, 3 for the shares between 30-45% and 4 for with the shares between 45-60%, 5 for the shares between 60-75%, 6 for the shares between 75-90% and 7 for the shares greater than 75%.

Capital Pillar: Combining all the four indices into a single index, generates the group index relevant for the capital pillar. Here as in the input pillar, each of the four different parameters indicates technology level in a different way and all the parameters may not be equally important while denoting technology level of manufacturing units belonging to different size classes or industry sectors. But their combination captures the technology level of a manufacturing unit from multiple perspectives of technology commitment as appreciated through use of capital, such as the amount of productive assets like plant and machinery, tools and equipment used by a labour, possession of necessary mortgage-able assets like land and building to buy costly machinery, share of productive assets in total assets, etc. Simply averaging the values of all the four indices for a manufacturing unit would provide the group index necessary for the capital pillar. Similar to input pillar index, we set scales from 1 to 7 for the capital pillar index as follows: average value 1 is very low technology (level 1); average value more than 1 up to 2 is low technology (level 2), more than 2 up to 3 is lower medium technology (level 3), more than 3 up to 4 is medium technology (level 4), more than 4 up to 5 in higher medium technology (level 5), more than 5 up to 6 is high technology (level 6) and above 6 is advanced technology (level 7).

3. Output Pillar: The level of technology used by a factory may be guessed indirectly through the outcome of the technology. Such outcome may be output per labour, value added per labour ratio of the value of goods sold at the same condition as purchased to total output, proportion of output exported, proportion of output produced under contract. Depending on the availability of information in the ASI database, following parameters are selected for the construction of the
output pillar:

i. *Value added per labour:* Higher value added per labour reflects higher level of technology commitment, such as investments made on modern machinery with latest technology or capital intensive technology. Index values corresponding to different ranges of VAD/labour are assigned to reflect technology levels as under: For the value added per labour less than Rs 25000 an index of 1 is assigned, for the range Rs 25-50 thousand index of 2 is assigned, for Rs 50-100 thousand index of 3 is assigned, for values ranging between Rs1-5 lakh index of 4 is assigned, for values in the range of Rs 5-25 lakh index of 5 is assigned, for values ranging between Rs 25-100 lakh index 6 is assigned, and an index of 7 for values greater than Rs 1 crore.

ii. Output per labour: Although this indicator is similar to value added per labour, there is a major difference for the smaller sized producers who operate with less margin but higher turnover. High competition especially from the large producers often compels them to sell their products at lower price and with lower margin of profit. But they survive with larger volume of production relative to their size. In this situation output per labour may be high despite their low value added per labour. Index values corresponding to different ranges of output per labour are assigned in order to reflect technology levels. For the output value per labour less than Rs 25000 an index of 1 is assigned, for the range Rs 25-50 thousand index of 2 is assigned, for Rs 50-100 thousand index of 3 is assigned, for values ranging between Rs1-5 lakh index of 4 is assigned, for values in the range of Rs 5-25 lakh index of 5 is assigned, for values ranging between Rs 25-100 lakh index 6 is assigned, and an index of 7 for values greater than Rs 1 crore.

iii. Contracting in work/work for others: An enterprise contracting in work from other enterprise probably uses a better technology than its counterpart contracting-out enterprise or from those who are not contracting-in similarly. Possibly an enterprise that regularly generates a good amount of revenue from contracting in manufacturing related activities may have set up specialized and dedicated plant and machinery to meet the quality standard of the buyer enterprise. Higher the percentage share of the revenue generated through contracting in of manufacturing activities to the total revenue, the higher would be the probability of having dedicated and specialized plant & machinery, skilled workforce, advanced process technology and other set up and so the technology level would be high. Different index values were allotted to the different ranges of these percentage shares of revenue. An index of 1 is assigned if the share is upto 5%, 2 is

assigned if the share lies between 5 to 15%, 3 between 15-25%, 4 between 25-40%, 5 between 40-60%, 6 between 60-80% and 7 for values exceeding 80%.

iv. Value of goods sold in the same condition as purchased: This category of product includes the goods that an enterprise buys from a third party vendor and markets the same together with selling own products. (It also includes some raw materials sold on the same condition as purchased. All sales of a factory can be classified according as to whether the sale is (i) of the product of the factory, (ii) of goods incidental to manufacturing, and (iii) other items not connected with manufacturing. The present parameter will relate sum of the goods of (ii) and (iii) above, which are sold in the same condition as purchased, i.e., without any transformation. It further includes the value of sales of goods normally consumed by the factory when sold as purchased as well as the sale value of goods brought expressly for resale). The reselling is probably done in order to overcome diseconomies of smaller scale transactions of own goods and the enterprise is not in a position to raise own production. An enterprise which holds less share of such goods in total output is probably technology efficient; this is because an enterprise if technologically self-sufficient and advanced would seldom involve in marketing goods manufactured by other. Various index values are allotted to the different ranges of percentage share of this category of goods in total output. An index value of 7 if the share is 0%, 6 if share is up to 10%, 5 for 10-25%, 4 for 25-35% , 3 for 35-50%, 2 for 50-75% and 1 for shares exceeding 75%.

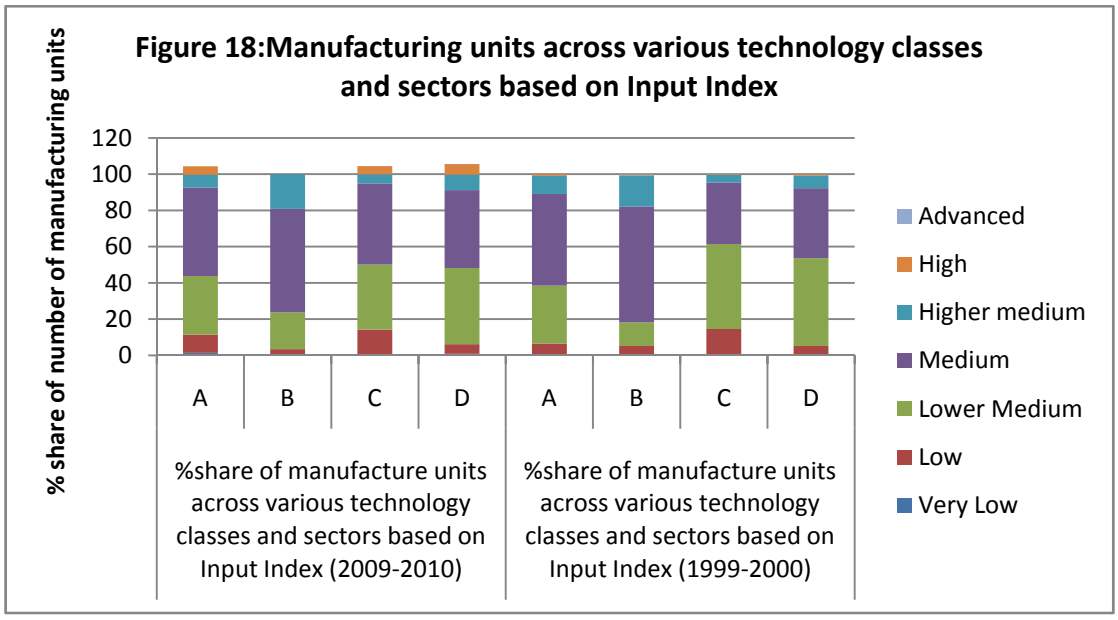
Output Pillar: Combining all the four indices into a single index generates the group index relevant for the output pillar. Here, as in the previous two cases, four different parameters indicate technology level in different ways from each other and further all the parameters may not be equally important while denoting technology level of manufacturing units belonging to different size classes or industry sectors. But they together capture the technology level of a manufacturing unit from a variety of perspectives of output, such as the amount of output per labour, amount of value added per labour, proportion of contracting in work in relation to total output, or proportion of others' products sold to total own production. Taking average of the values of all the four indices for a manufacturing unit would provide the group index necessary for the output pillar. Similar to the previous two cases, we set scales from 1 to 7 for the output pillar

index as follows: average value 1 is very low technology (level 1); average value more than 1 up to 2 is low technology (level 2), more than 2 up to 3 is lower medium technology (level 3), more than 3 up to 4 is medium technology (level 4), more than 4 up to 5 in higher medium technology (level 5), more than 5 up to 6 is high technology (level 6) and above 6 is advanced technology (level 7).

Combined Index: After obtaining the indices for input pillar, capital pillar and output pillar for each factory unit a combined index is generated by taking simple average of the index values of the three pillars of technology. The criteria of indexing technology levels is the same as used for the individual pillars: average value 1 is very low technology (level 1); average value more than 1 up to 2 is low technology (level 2), more than 2 up to 3 is lower medium technology (level 3), more than 3 up to 4 is medium technology (level 4), more than 4 up to 5 in higher medium technology (level 5), more than 5 up to 6 is high technology (level 6) and above 6 is advanced technology (level 7).

Estimates of technological change:

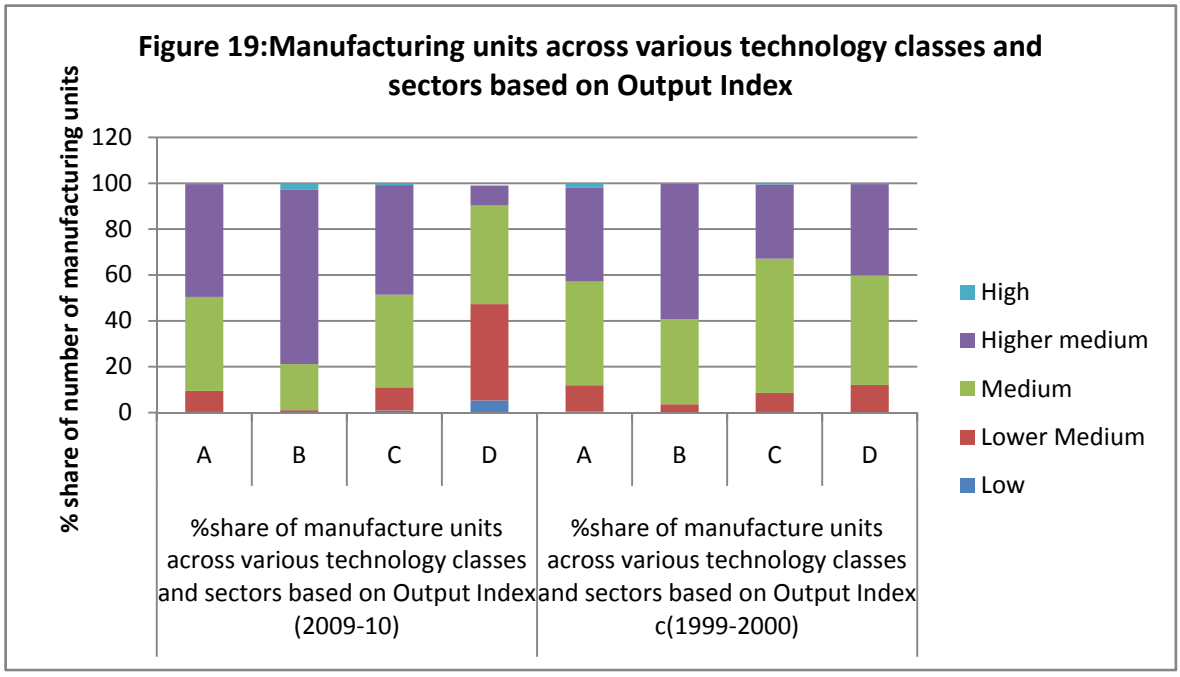
Considering the values of Input index and the technology level(Figure 18) for various manufacturing units of the food sector endorses the fact that most of food manufacturing units across the different food sectors mainly use medium level technologies of production. On comparing the data of 2009-10 with the data of 1999-2000 we see that a gradual innovation in technology has taken place in the food industry within a span of 10 years and due to this around 4% of the manufacturing units involved in Production, processing and preservation of meat, fish, fruit vegetables, oils and fats have been registered under higher technology levels - 88% of such manufacturing units in 2010 deployed lower medium to higher medium levels of technology, in contrast, in the year 2000 around 92% of the units used lower to higher medium levels of technology.



Sources: Compiled from ASI unit level data for the years 1999-00 and 2009-10

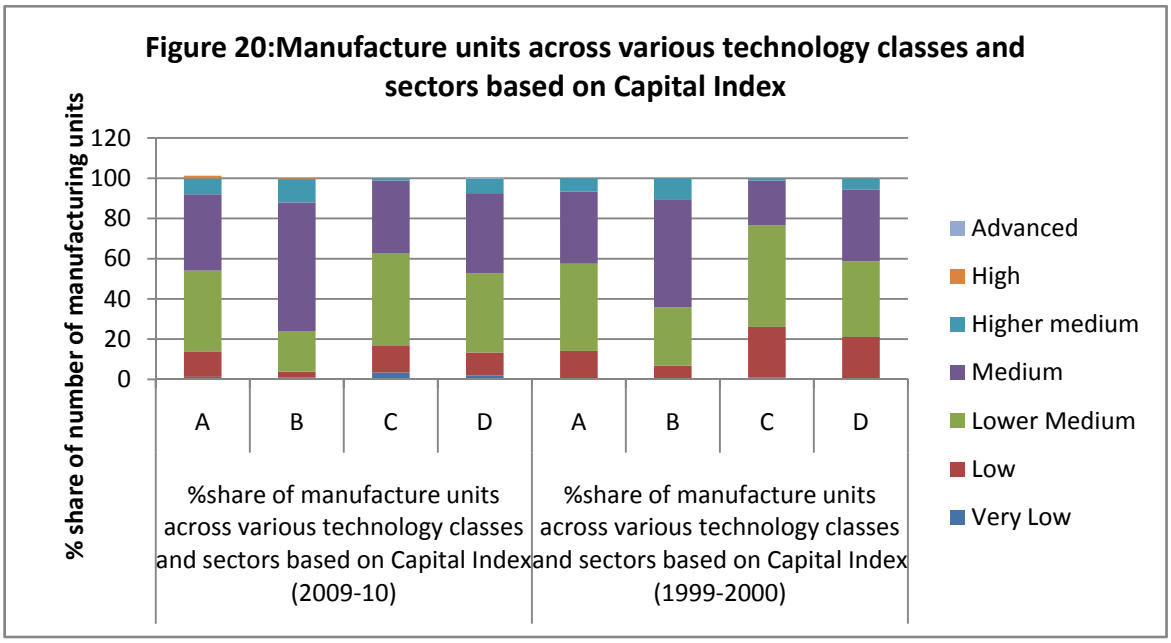
This could be attributed to the fact that the higher demand in the market for processed food has impacted greater innovation in terms of technology in this sector so as to fulfill the rising demand with good quality products produced via efficient and cost effective techniques of production. Around 94% manufacturing units involved in processing and manufacturing dairy products during 1999-2000 employed lower to higher medium levels of technology while 0.4 and 0.2% of the units were using high and advanced levels of technology respectively. Whereas around 96% of the manufacturing units in the dairy sector used lower to medium level of technology with no units using high or advanced technology of production. This could probably mean that few of the units using the high and advanced level of technology were shut down due to sickness, which possibly would have resulted from lack of infrastructure, adequate capitals required to maintain the higher and up graded level of technology of production. The units involved in Manufacture of grain mill products, starches and starch products, and prepared animal feeds do not portray any significant change during the span of 10 years and majority of the firms (about 85% of the units) use lower to higher medium levels of technology of production. From this we can assume that not much of technological innovation has taken place in this sector. This could also mean that probably majority of the units involved in this sector come under the unorganized units of production and lack various facilities, funds and adequate knowledge to adopt the higher and advanced technology of production. The manufacturing firms involved in manufacture of other food products mainly the bakery products, confectionary etc also depict a similar scenario with almost 94% of the units deploying lower to higher medium levels of technology of production. The size related statistics viz-a-viz the input index (Figure 23) and the various technology levels give us a clear picture on the scaling up of the production

process and the level of technology usage under different sizes of manufacturing units. It is evident from the data that the number of micro units have declined in 2010 as compared to 2000.This suggests that production scaling up has most likely taken place within the time span. It also suggests that most of the micro units in 2000(87%) as well as in 2010(90%) have deployed lower to higher medium level of technology of production. The data further suggest that few of the micro units (0.6%) in the year 1999-2000 also depended on higher level of technology however none of the manufacturing units in the year 2010 deployed higher level technology.. Such a pattern of technology usage among the micro units of production indicate that the micro units lack adequate capital, infrastructure and the knowledge to sustain high and advanced technology of production. About 9% of the small food manufacturing units in 2000 in contrast to 14% of the small units in 2010 employed very low to low levels of technology in the manufacturing process. Around 85% of the smaller units in 2000 relied on lower medium to higher medium levels of technology whereas in 2010 this figure increased to 90% of the manufacturing units. This clearly shows that the number of small firms using high and advanced technology of production in 2000 were higher than in 2010.This also brings into picture the various hardships and constraints which the smaller units of production in our country face in terms of capital, skills, assets and proper market knowledge. In case of the medium and large units of production we observe that about 1% of the units deploy high and advanced technologies of production in 2010 in contrast to the insignificant proportion of firms that belonged to this category of technology usage in 2000.



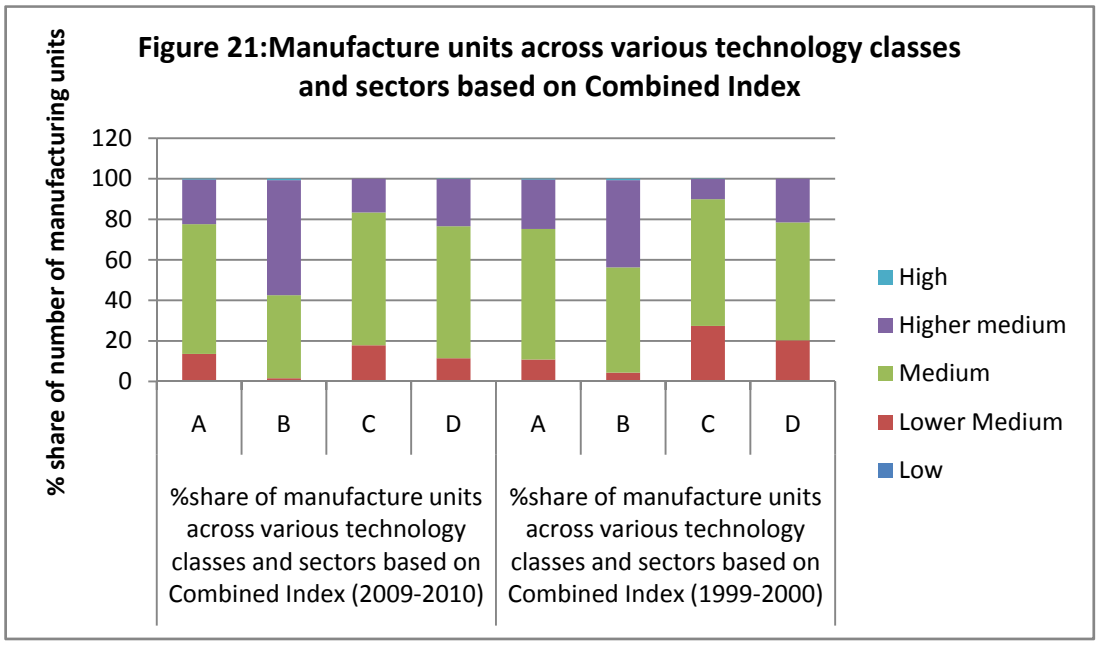
Sources: Compiled from ASI unit level data for the years 1999-00 and 2009-10

The output index values along with the various levels of technology (Figure 19) used in food manufacturing units indicate that about 97-99% of the units in 2000 as well as in 2010 mainly use lower to higher medium levels of technology. However among firms engaged in manufacturing of other food products mainly bakery, sugar, confectionary items and other products like chewing gum, cocoa products etc a higher proportion of units (about 5%) used lower level of technology in the year 2010 in contrast to insignificant figures of 2000. From this it can be ruminated that the performance of this particular sector has to some extent deteriorated during the span of 10 years. This might have happened due to an increased competition in the market, inability to cater to the need of people with high quality products, inability to get rid of obsolete production technologies due to lack of capital and appropriate set up. The output index values corresponding to various technology levels along with the size of the manufacturing units (Figure 24) suggest that scaling up of production has taken place between 2000 and 2010. However there has not been corresponding technology innovation to any great extent during this period. This is borne out by the fact that about 5% of the large enterprises in 2000 incorporated higher technology levels of production whereas this number reduced to about 3.5% in 2010.It primarily connotes the lack of R&D initiatives in the country coupled with the other factors such as lack of capital, assets and proper framework to support the high end technologies of production. But the small enterprises have a different scenario altogether and exhibit innovation in terms of technology. This is mainly because of a rise in the fraction of firms that adopted high end technologies of production. The scenario within the micro units is supposedly different as these firms display some sort of innovations during the decade through a movement from very low to medium level of technology although there was a decrement in number of micro firms employing higher level of technology. The medium enterprises also depict a similar pattern as the micro units with respect to technology usage and innovation.



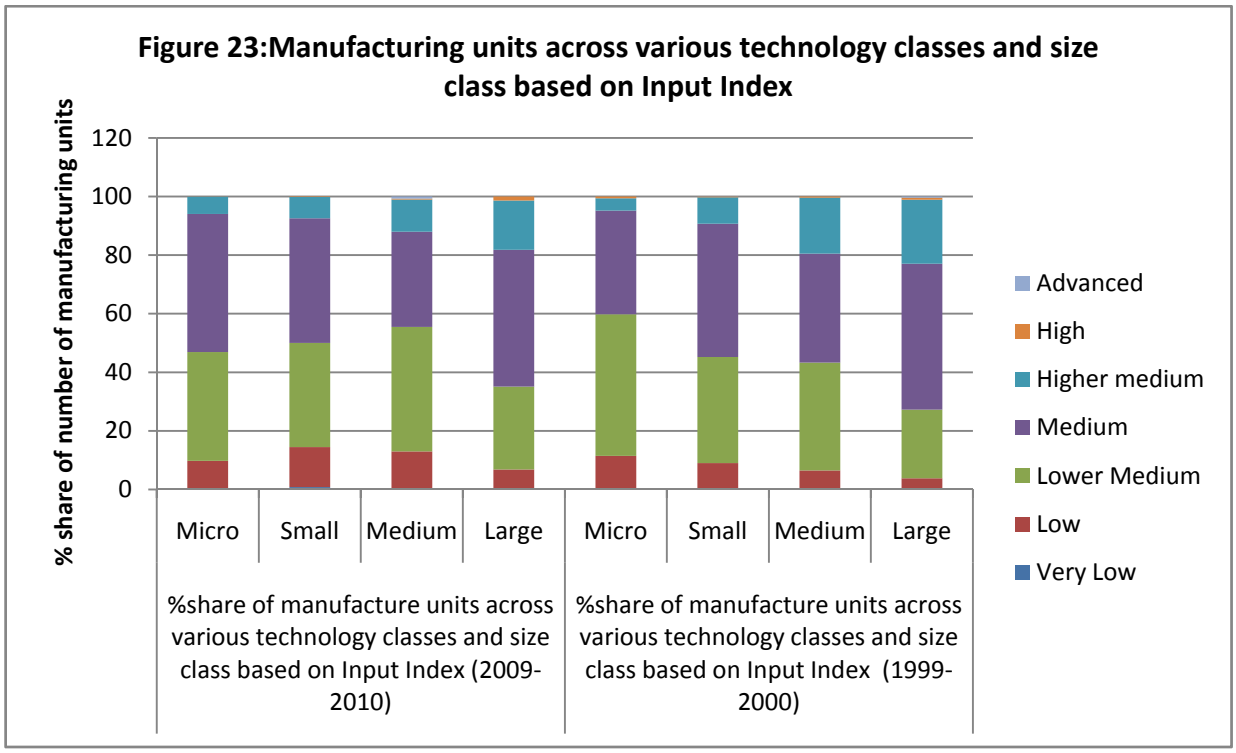
Sources: Compiled from ASI unit level data for the years 1999-00 and 2009-10

The capital index value with respect to technology levels(Figure 20) across various food sectors suggests that majority of the enterprises mainly depended upon lower to higher medium levels of technology. The capital index values do not suggest much of technology innovation among the firms under various subsectors during 2000-2010.This manifests the fact that food industry is yet to come up with rigorous R&D activities in order to compete with its peers globally. As a result the India food sector might end up spending more in importing technology resulting in increased costs of manufacturing. The increased peer pressure in the market might impact the food industries such that they opt to buy technology rather than develop one indigenously to produce high quality food products. The size related statistics of the capital index along with the technology levels (Figure 25) across various manufacturing units also suggests that most of the food producing firms have been stagnant at lower to medium levels of technology usage. The combined index figures (Figure 21) also indicate that most of the food manufacturing firms depend on lower medium to higher medium technology. The figures have not changed much over the decade. However we may say that some up gradation in technology has been witnessed, as in 2010 we do not find any manufacturing unit that uses a very low or an outdated technology of production. Moreover the size related statistics (Figure 26) suggests an up gradation in the production scale. This is possibly due to the greater market demand, flexible fiscal and taxation policies, merger and acquisitions, FDI incorporation, financial aid from governmental and financial institutions.

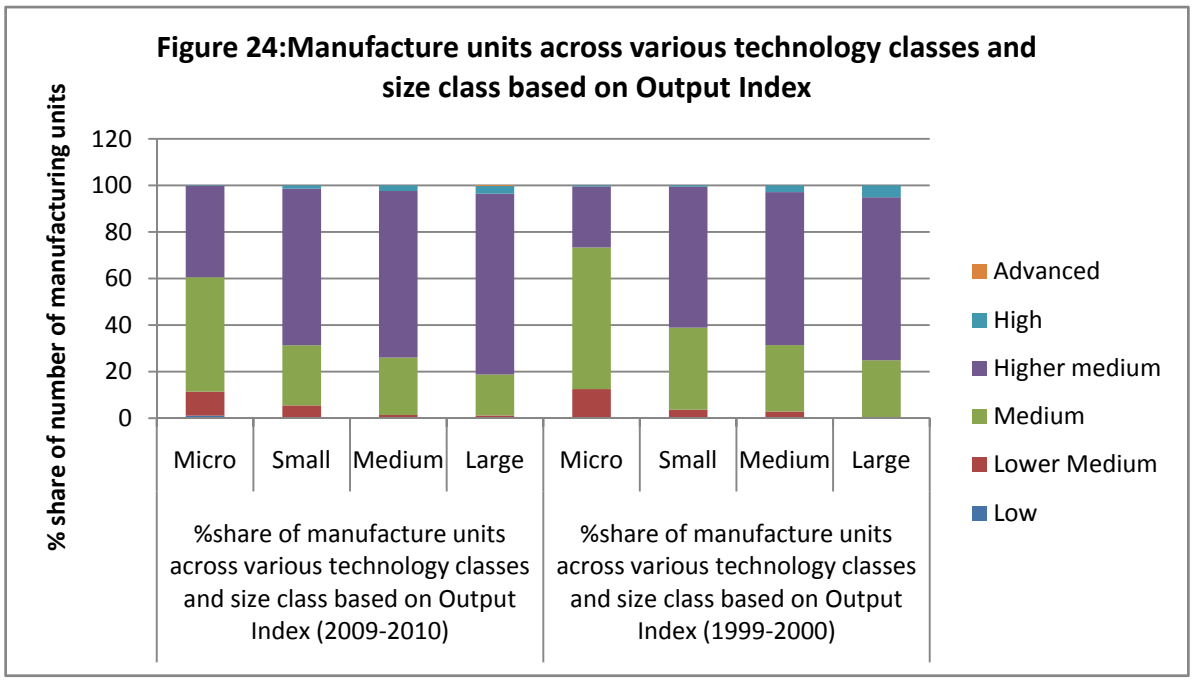


Note:A= Production, processing and preservation of meat, fish, fruit vegetables, oils and fats (151)B= Manufacture of dairy product (152)C= Manufacture of grain mill products, starches and starch products, and prepared animal feeds (153)D= Manufacture of other food products (154)

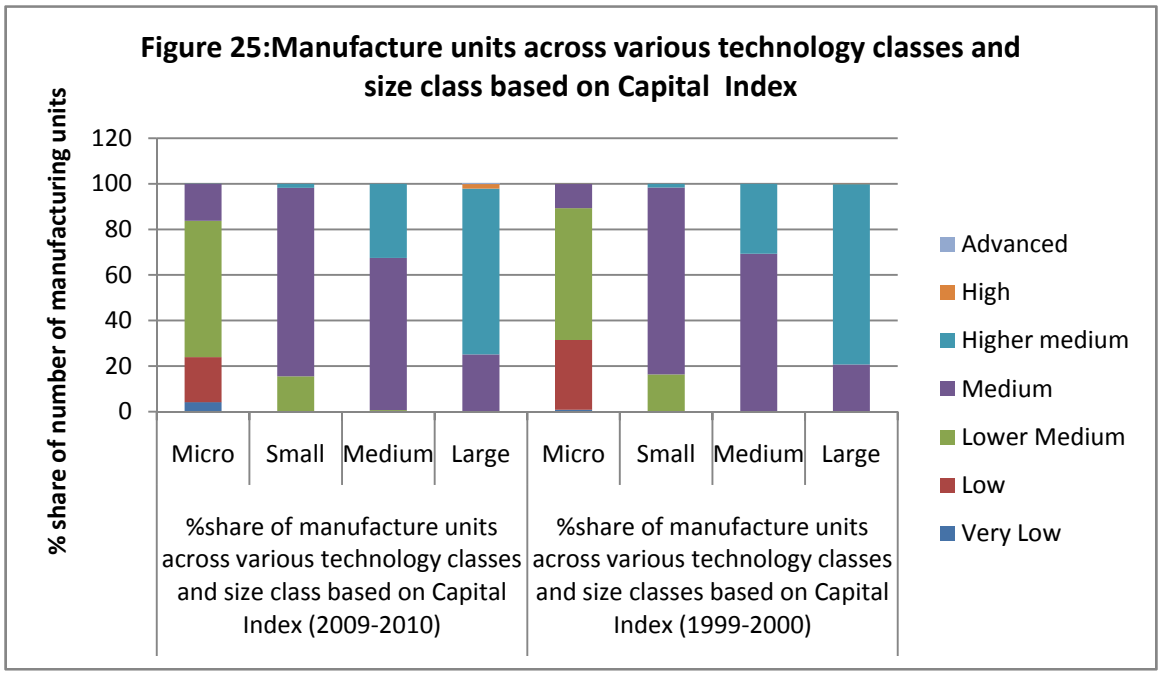
Sources: Compiled from ASI unit level data for the years 1999-00 and 2009-10



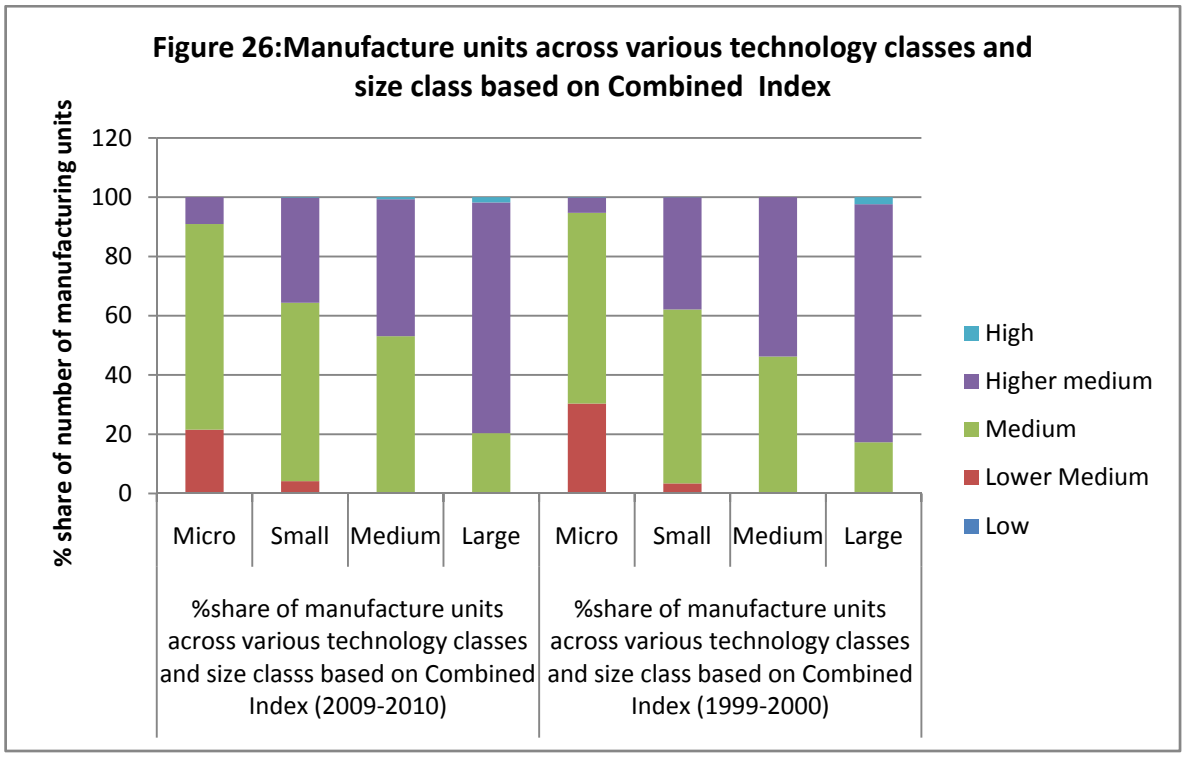
Sources: Compiled from ASI unit level data for the years 1999-00 and 2009-10



Sources: Compiled from ASI unit level data for the years 1999-00 and 2009-10



Sources: Compiled from ASI unit level data for the years 1999-00 and 2009-10



Sources: Compiled from ASI unit level data for the years 1999-00 and 2009-10

Chapter 4

Summary and Concluding Observations

The Indian food products industry witnessed a steady growth over the past few decades due to the demand upsurge partly led by population growth and partly due to increase in the per capita consumption of processed food together with some improvements in supply-side factors. Informal sector has a sizeable share in the gross value added by the food industry. In a sense the informal food sector mainly operates as an absorbing agent for the skilled labourers who are not employed by other formal sectors. The most significant changes that have taken place over the last decade are: (a) a considerable rise in the share of formal sector enterprises *'Manufacture of dairy products'* in the gross value added (GVA) by the food products industry as a whole; (b) the share of informal sector enterprises involved in '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds'* in GVA of food industry has fallen; (c) for the product category, '*Manufacture of other food products (154)'***,** the share of formal sector has fallen in the GVA of the food industry. Yet the share of informal MSMEs has remained consistently higher in the various food sectors than the formal sector over the decade (2000-2010). The share of MSMEs in total GVA has increased in the product category, '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds*' by a much higher rate, as compared to the other product categories over the span of ten years.

During 2009-10, Andhra Pradesh outperforms other states in terms of contribution to the total GVA generated under '*Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats*' by the micro enterprises, with a contribution of around Rs 66.98 crores, which is around 1.75 times higher than it was in 1999-00. Andhra Pradesh also experienced the highest increase in capital intensity over the decade among the micro-enterprises. Madhya Pradesh displays the highest productivity in 2009-10 for the product category 151 while Gujarat displays the maximum productivity in manufacture of the dairy products - there has been a 4.5 fold rise in the GVA for Gujarat during 1999-2010. Under '*Manufacture of grain mill products, starches and starch products, and prepared animal feeds'*, Andhra Pradesh emerges out as a leader and tops the list by contributing a total GVA of around Rs. 2260 crores. Andhra Pradesh is followed by Maharashtra (Rs. 1220 crores) and Haryana (Rs.1070 crores). In the case of *'Manufacture of other food products'*, Maharashtra becomes the leading state with GVA of Rs. 4490 crores.

An analysis of business linkages among various food manufacturing units depicts that there exists instances of contractual linkages between differently scaled units. Consequently we can predict that the large scale firms might contract out manufacturing activities to the smaller units and in turn these large

units might share expertise and technical knowledge with the smaller counterparts. ASI and NSSO data endorse the fact that the young enterprises or the start ups engage in one or more contracts and achieve higher productivity. It is also noted that the productivity (value added per labor) and capital intensity are lower in case of formal MSMEs than the larger firms. The reason behind the low productivity in MSMEs could be the use of more labor intensive techniques instead of up graded machine technology. It is also marked that the small scale manufacturing units which are engaged in some contractual relationship with the large firms attain a higher productivity than their peers which do not involve in any form of contracts. India mainly exports Crustaceans and fish frozen (whole) in the international market and its leading trade partners are USA, Japan, Spain, China and UK. In addition, as a result of some sub-sector specific policies being adopted recently, exports of fruits and vegetable products and marine fish products are freely allowed.

It is found that most of the food manufacturing units mainly use lower to higher medium levels of technology. However it is further observed that there has been some technological innovation across food industries between 1999-2010.It is also obvious from the size class-wise statistics relating to various technology levels that with a moderate churning rate, there has been a scale up within the food manufacturing units and a decline in the number of micro and small enterprises using low level technology over the decade. Yet overall technology level is not at all high or advanced. Small and micro enterprises predominantly use medium technology. The reason behind the present technological backwardness can be attributed to the various hardships that these units face in up gradating in technology. Paradoxically the medium and large food manufacturing units have witnessed a significant technological advancement over the decade. This could be due to the exigencies of peer pressure quality control of food products abroad requiring advanced techniques of production. An increase in the demand for processed food in domestic and global market has thus contributed to technological innovation within the food manufacturing sector.

In sum, there is an urgent need of substantially raising the technology levels of the Indian food manufacturing: processing, storage/ preserving, transporting, all require major up gradation of technology. This is required not only for exporting but also to serve domestic market, prevent wastage, recovery of food nutrients, and serving the people round the year good quality food. Role of state in this process of technology development/ up-gradation is all the more important; it has to raise R&D activities and create various incentives for enterprises to adopt new or improved technology. In this regard existing scheme for technology up-gradation may be widened.

Annexure Tables

Annexure Table 2.1: Distribution of firms across different business linkages across Size classes					
Product Category/size class	***Contracting in but not contracting out***	***Contract out but not contract in***	***Both contract out and contract in***	***Neither contract in or contract out***	***Total Number of enterprises***
Micro					
151	758	60	156	376	1350
152	152	9	17	38	216
153	***3,918***	***241***	***762***	***1,228***	6149
154	1,505	74	226	504	2309
Small					
151	499	25	143	58	725
152	184	8	157	45	394
153	***1,513***	***82***	***444***	***350***	2389
154	1,127	19	204	221	1571
Medium					
151	63	2	42		107
152	8	0	21		29
153	***17***	***7***	***16***		40
154	77	2	25	3	107
Large					
151	97	3	44		144
152	26	6	19	1	52
153	***67***	***3***	***21***	***5***	96
154	244	6	77	49	376

Source: ASI 2009-10

Annexure Table 2.2.a:Agewise distribution of contractual linkages of Micro enterprises across Three digit product categories							
Product Category	***Age(In years)***	***Contracting in but not contracting out(In numbers)***	***Contract out but not contract in(In numbers)***	***Both contract out and contract in(In numbers)***	***Neither contract in or contract out(In numbers)***	***ALL***	**% within each code**
	1	6		5		11	0.81
	2	22			5	27	2.00
	3	46	6		12	64	4.74
	4	41		10	32	83	6.15
	5	36		5	10	51	3.78
	6 to 10	113	7	30	26	176	13.04
151	11 to 15	105	11	28	64	208	15.41
	16 to 20	101	5	21	44	171	12.67
	21 to 30	127	15	34	91	267	19.78
	31 to 50	119	6	18	75	218	16.15
	Above 51	42	10	5	17	74	5.48
	All	758	60	156	376	1,350	100.00
	1	1				1	0.5
	2	15				15	6.9
	3						
	4	5	5		6	16	7.4
	5	16		5		21	9.7
152	6 to 10	10			7	17	7.9
	11 to 15	36		5	10	51	23.6
	16 to 20	11		1	5	17	7.9
	21 to 30	33		5	5	43	19.9
	31 to 50	13	4	1		18	8.3
	Above 51	12			5	17	7.9
							0.0

	All	152	9	17	38	216	100.0
153	0	5				5	0.08
	1	75	5	10	20	110	1.79
	2	105		15	15	135	2.20
	3	96	29	21	36	182	2.96
	4	144	10	27	25	206	3.35
	5	145	5	41	52	243	3.95
	6 to 10	661	30	136	133	960	15.61
	11 to 15	675	34	160	166	1,035	16.83
	16 to 20	412	30	98	213	753	12.25
	21 to 30	829	68	155	351	1,403	22.82
	31 to 50	499	20	66	176	761	12.38
	Above 51	272	10	33	41	356	5.79
							0.00
	All	3,918	241	762	1,228	6,149	100.00
154	0	5				5	0.22
	1	36		1	6	43	1.86
	2	64	1	5	10	80	3.46
	3	35	5	17	8	65	2.82
	4	92	5	13	22	132	5.72
	5	61		10	11	82	3.55
	6 to 10	245		37	123	405	17.54
	11 to 15	186	8	35	72	301	13.04
	16 to 20	136	17	24	58	235	10.18
	21 to 30	283	28	45	61	417	18.06
	31 to 50	169	8	34	91	302	13.08
	Above 51	193	2	5	42	242	10.48
	All	1,505	74	226	504	2,309	100.00

Source: ASI 2009-10

Annexure Table2.2b:Agewise distribution of contractual linkages of Small enterprises across Three digit product categories							
Product Category	***Age(In years)***	***Contracting in but not contracting out(In numbers)***	***Contract out but not contract in(In numbers)***	***Both contract out and contract in(In numbers)***	***Neither contract in or contract out(In numbers)***	***ALL***	**% within each code**
151	0	10				10	1.38
	1	17		1	5	23	3.17
	2	19	1	5	1	26	3.59
	3	32	8	9	1	50	6.90
	4	17		11	7	35	4.83
	5	36		4	4	44	6.07
	6 to 10	127	6	24	5	162	22.34
	11 to 15	67		23	7	97	13.38
	16 to 20	71		30	20	121	16.69
	21 to 30	68	5	22		95	13.10
	31 to 50	25	1	10	1	37	5.10
	Above 51	10	4	4	7	25	3.45
							0.00
	All	499	25	143	58	725	100.00
152	0						
	1	2				2	0.51
	2	5		4		9	2.28
	3	10		4		14	3.55
	4	1		1		2	0.51
	5	35		8		43	10.91
	6 to 10	20		35	11	66	16.75
	11 to 15	48	6	26	15	95	24.11
	16 to 20	15		21	6	42	10.66
	21 to 30	20		20	7	47	11.93
	31 to 50	18	1	25	1	45	11.42

	Above 51	10	1	13	5	29	7.36
							0.00
	All	184	8	157	45	394	100.00
153	0	6				6	0.25
	1	59		20	10	89	3.73
	2	84		10	37	131	5.49
	3	101		25	22	148	6.20
	4	79		29	23	131	5.49
	5	78		30	11	119	4.98
	6 to 10	342	35	63	47	487	20.39
	11 to 15	242	20	59	67	388	16.25
	16 to 20	136	6	90	36	268	11.22
	21 to 30	232	15	74	54	375	15.70
	31 to 50	90	6	18	21	135	5.65
	Above 51	63		26	22	111	4.65
							0.00
	All	1,512	82	444	350	2,388	100.00
154	0						
	1	19	1		1	21	1.34
	2	15		14	19	48	3.07
	3	39	6	5	10	60	3.83
	4	52		6	7	65	4.15
	5	32		12	10	54	3.45
	6 to 10	149	3	25	32	209	13.35
	11 to 15	77		45	38	160	10.22
	16 to 20	57		26	7	90	5.75
	21 to 30	72		35	26	133	8.50
	31 to 50	125	4	27	18	174	11.12
	Above 51	484	5	9	53	551	35.21
							0.00
	All	1,121	19	204	221	1,565	100.00

Annexure Tab 2.2c:Agewise distribution of contractual linkages of Medium enterprises across Three digit product categories							
Product Category	***Age(In years)***	***Contracting in but not contracting out(In numbers)***	***Contract out but not contract in(In numbers)***	***Both contract out and contract in(In numbers)***	***Neither contract in or contract out(In numbers)***	***ALL***	**% within each code**
151				1		1	0.88
	1	1	1			2	1.75
	2	1			1	2	1.75
	3	1		1		2	1.75
	4	14				14	12.28
	5	6		5		11	9.65
	6 to 10	12		4	6	22	19.30
	11 to 15	7		7		14	12.28
	16 to 20	13		5		18	15.79
	21 to 30	4	1	7		12	10.53
	31 to 50	2		6		8	7.02
	Above 51	2		6		8	7.02
							0.00
	All	63	2	42	7	114	100.00
152	1						
	2						
	3						
	4	1				1	3.45
	5						
	6 to 10	1		1		2	6.90
	11 to 15	1		7		8	27.59
	16 to 20			5		5	17.24
	21 to 30	2		3		5	17.24
	31 to 50	3		4		7	24.14
	Above 51			1		1	3.45
							0.00
	All	8		21		29	100.00

153	0						
	1						
	2	5				5	13.51
	3						
	4		5			5	13.51
	5			1		1	2.70
	6 to 10	5	1		1	7	18.92
	11 to 15	2		5	1	8	21.62
	16 to 20			8		8	21.62
	21 to 30	1	1	1		3	8.11
	31 to 50	3				3	8.11
	Above 51	1		1		2	5.41
							0.00
	All	17	7	16	2	42	100.00

154	0						
	1	1		1		2	1.87
	2	5		2		7	6.54
	3	1				1	0.93
	4	2				2	1.87
	5						
	6 to 10	19		5		24	22.43
	11 to 15	9		3		12	11.21
	16 to 20	6	1	1	1	9	8.41
	21 to 30	13		3		16	14.95
	31 to 50	5	1	9		15	14.02
	Above 51	16		1	2	19	17.76
							0.00
	All	77	2	25	3	107	100.00

Source: ASI 2009-10

Annexure Table2.2d:Agewise distribution of contractual linkages of Large enterprises across Three digit product categories							
Product Category	***Age(In years)***	***Contracting in but not contracting out(In numbers)***	***Contract out but not contract in(In numbers)***	***Both contract out and contract in(In numbers)***	***Neither contract in or contract out(In numbers)***	***ALL***	**% within each code**
	1	15	1			16	10.81
	2	5		1		6	4.05
	3	1		2		3	2.03
	4	8	1	6		15	10.14
	5	4		5	1	10	6.76
	6 to 10	21		10	2	33	22.30
151	11 to 15	9		4		13	8.78
	16 to 20	13		5	1	19	12.84
	21 to 30	13	1	8		22	14.86
	31 to 50	5		3		8	5.41
	Above 51	3				3	2.03
							0.00
	All	97	3	44	4	148	100.00
	1						
	2						
	3	1				1	1.92
	4	2			1	3	5.77
	5	1	5	1		7	13.46
152	6 to 10	3		1		4	7.69
	11 to 15	9		2		11	21.15
	16 to 20		1	5		6	11.54
	21 to 30	4		4		8	15.38
	31 to 50	4		5		9	17.31
	Above 51	2		1		3	5.77
							0.00

	All	26	6	19	1	52	100.00
153	0						
	1	5		3		8	8.33
	2	8		6		14	14.58
	3			1	2	3	3.13
	4	1	1			2	2.08
	5	7			2	9	9.38
	6 to 10	16		3	1	20	20.83
	11 to 15	10		2		12	12.50
	16 to 20	1		2		3	3.13
	21 to 30	6		2		8	8.33
	31 to 50	11		2		13	13.54
	Above 51	2	2			4	4.17
							0.00
	All	67	3	21	5	96	100.00
154	0	1				1	0.27
	1	1			1	2	0.54
	2	8		2	7	17	4.61
	3	11	1	3	6	21	5.69
	4	11	1	1	1	14	3.79
	5	9		1		10	2.71
	6 to 10	39	3	14	11	67	18.16
	11 to 15	35		10	2	47	12.74
	16 to 20	16		10	1	27	7.32
	21 to 30	22		11	3	36	9.76
	31 to 50	33	1	8	8	50	13.55
	Above 51	58		17	2	77	20.87
							0.00
	All	244	6	77	42	369	100.00

Source: ASI 2009-10

Annexure Table 2.3: Pattern of VAD/L and K/L across different patterns of business links and size classes for the three digit product categories					
Size		*Contracting in but not contracting out*	*Contracting out but not contracting in*	*Both contracting in and contracting out*	*Neither contracting in nor contracting out*
Micro					
151	GVA/L (Rs)	215248	237906	193319	185940
	K/L (Rs)	72383	160520	73341	76059
152	GVA/L (Rs)	187384	219271	153021	192336
	K/L (Rs)	176535	85823	212225	130374
153	GVA/L (Rs)	190010	313544	222010	207064
	K/L (Rs)	73764	73014	92141	84676
154	GVA/L (Rs)	137910	166312	189878	189924
	K/L (Rs)	65201	27028	53235	61634
Small					
151	GVA/L (Rs)	374681	321393	903376	244571
	K/L (Rs)	469538	303311	401766	245118
152	GVA/L (Rs)	776668	296988	660878	497942
	K/L (Rs)	748762	436292	475012	422130
153	GVA/L (Rs)	448302	558802	467727	708281
	K/L (Rs)	392775	227028	406793	533840
154	GVA/L (Rs)	360014	509268	596150	347594
	K/L (Rs)	207848	390244	374160	264064
Medium					
151	GVA/L (Rs)	486717	565923	432991	990272
	K/L (Rs)	1316170	842889	582778	982764
152	GVA/L (Rs)	516751		728078	
	K/L (Rs)	421326		1130269	

153	GVA/L (Rs)	1137305	536536	442845	1186427
	K/L (Rs)	538929	777244	282974	734875
154	GVA/L (Rs)	637624	1744817	542610	308842
	K/L (Rs)	579068	280727	913713	332541
Large					
151	GVA/L (Rs)	959772	504133	1326247	3289801
	K/L (Rs)	2855509	491706	1198703	1404481
152	GVA/L (Rs)	1017403	1894173	889339	315937
	K/L (Rs)	935670	966040	713835	458390
153	GVA/L (Rs)	1185045	690863	1395047	557737
	K/L (Rs)	2000847	3962992	2577008	914441
154	GVA/L (Rs)	1215992	1026330	931500	886304
	K/L (Rs)	1697100	1204623	1306853	1588303

Source: ASI 2009-10

Annexure Table 2.4a: Distribution of Export across each three digit code

Product categories	***Export under each group (In crores)***	***Total export of formal enterprises under group 201 (In crores)***	***Share of each 4 digit code (%)***
151	6300	17500	36
152	530	17500	3.03
153	5280	17500	30.17
154	5380	17500	30.74

Annexure Table 2.4b:Contribution of Firms in total exports of each three digit code

Product Categories	***Total export (in Crores)***	***Micro enterprises***		***Small enterprises***		***Medium enterprises***		***Large enterprises***		***Total share of MSMEs***
		Share in total export(%)	***share of firms(%)***	***Share in total export(%)***	***Share of firms(%)***	***Share in total export(%)***	***share of firms(%)***	***Share in total export(%)***	***share of firms(%)***	
151	6300	3.51	57.77	43.17	31.02	8.29	4.88	44.92	6.33	54.97
152	530	0.00	31.26	1.07	57.02	0.00	4.20	99.06	7.53	1.07
153	5280	1.61	70.87	21.02	27.54	6.70	0.48	70.64	1.11	29.34
154	5380	23.42	52.92	44.61	36.01	2.73	2.45	29.18	8.62	70.76

Source: ASI 2009-10

Annexure Table 2.4c: Distribution of firms across different business links and their relative exports across size classes

Size/ Product Category		***Contracting in but not out***	***Contracting out but not in***	***Both in and out***	***Neither in nor out***
Micro					
151	Share in total exports (%)	40.32	0.00	24.84	34.71
	Share of firms (%)	56.15	4.44	11.56	27.85
152	Share in total exports (%)				
	Share of firms (%)	70.37	4.17	7.87	17.59
153	Share in total exports (%)	56.52	0.00	9.99	33.49
	Share of firms (%)	63.72	3.92	12.39	19.97
154	Share in total exports (%)	47.70	7.11	44.60	0.81
	Share of firms (%)	65.18	3.20	9.79	21.83
Small					
151	Share in total exports (%)	34.85	0.00	54.41	10.70
	Share of firms (%)	68.83	3.45	19.72	8.00
152	Share in total exports (%)	50.09	0.00	0.00	49.91

	Share of firms (%)	46.70	2.03	39.85	11.42
153	Share in total exports (%)	68.56	6.68	14.23	10.18
	Share of firms (%)	63.33	3.43	18.59	14.65
154	Share in total exports (%)	18.67	0.34	78.33	2.44
	Share of firms (%)	71.74	1.21	12.99	14.07
Medium					
151	Share in total exports (%)	20.88	0.00	79.12	0.00
	Share of firms (%)	55.26	1.75	36.84	6.14
152	Share in total exports (%)				
	Share of firms (%)	27.59	0.00	72.41	0.00
153	Share in total exports (%)	48.02	32.20	19.94	0.00
	Share of firms (%)	40.48	16.67	38.10	4.76
154	Share in total exports (%)	57.01	0.00	42.79	0.00
	Share of firms (%)	71.96	1.87	23.36	2.80
Large					
151	Share in total exports (%)	36.04	0.00	64.31	0.00
	Share of firms (%)	65.54	2.03	29.73	2.70
152	Share in total exports (%)	11.96	19.24	68.76	0.00
	Share of firms (%)	50.00	11.54	36.54	1.92
153	Share in total exports (%)	43.70	0.00	56.30	0.02
	Share of firms (%)	69.79	3.13	21.88	5.21
154	Share in total exports (%)	85.35	0.00	14.52	0.00
	Share of firms (%)	64.89	1.60	20.48	13.03

Source: ASI 2009-10

Annexure Table 2.4d: Regional Distribution of exports across size classes					
Size	**States**	**% Distribution across Product Categories**			
Micro		**151**	**152**	**153**	**154**
	Haryana	34.71	0.00	0.00	0.00
	Uttar Pradesh	0.00	0.00	33.49	0.00
	West Bengal	21.00	0.00	0.00	0.00
	Gujarat	0.00	0.00	53.70	0.18
	Kerala	24.84	0.00	0.00	57.06
	Tamil Nadu	0.00	0.00	7.40	35.48
Small					
	Haryana	0.00	0.00	30.45	5.17
	Uttar Pradesh	22.13	100.00	30.81	2.75
	Gujarat	5.66	0.00	11.80	23.46
	Maharashtra	32.28	0.00	0.43	3.92
	Kerala	11.99	0.00	3.51	47.92
	Tamil Nadu	13.90	0.00	15.23	4.83
Medium					
	Haryana	0.00	0.00	27.06	4.95
	Uttar Pradesh	0.00	0.00	32.20	0.00
	West Bengal	0.00	0.00	20.99	0.00
	Maharashtra	83.72	0.00	0.00	36.80
	Andhra Pradesh	1.02	0.00	3.19	16.12
	Kerala	0.00	0.00	0.00	37.07
Large					
	Punjab	21.94	0.00	1.52	5.01
	Haryana	0.00	0.00	54.69	1.51
	Uttar Pradesh	27.63	30.29	29.76	0.29
	Maharashtra	15.37	69.71	0.00	6.43
	Andhra Pradesh	22.37	0.00	0.00	0.00
	Karnataka	0.00	0.00	0.00	78.98

Source: ASI 2009-10

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