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### **India: Qualitative study on Innovation in Manufacturing Small and Medium Sized Enterprises (SMEs)**

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# **Qualitative Study on Innovation in Manufacturing Small and Medium-Sized Enterprises (SMEs) in Gujarat, India**

## **Exploration of Policy and Research Issues**

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We would like to thank the enterprise owners and managers who gave up their time and were willing to talk and share their perceptions of daily realities, their stories and views with us. We also thank Prof. Devanath Tirupati, Dean of the Amrut Mody School of Management (AMSOM) of Ahmedabad University, our research partner, for making the fruitful collaboration possible. Special thanks to co-researcher Dr Abrar Ali Saiyed for organising and participating in the data collection, and sharing his valuable observations and thoughts. Finally, we would like to thank the Confederation of Indian Industries Gujarat Chapter, especially Mr Parthesh Vyas and his team, who connected us with these enterprises.

Jaap Voeten (Tilburg University/Radboud University Nijmegen)



# Contents

Introduction.....	1
1. DFID research project challenges.....	3
1.1 Approach: complementing quantitative with qualitative research .....	3
1.2 Case study methodology.....	4
1.3 Selection of SMEs and fieldwork.....	5
1.4 Fieldwork .....	6
2. Introducing manufacturing SMEs in India .....	7
2.1 The manufacturing sector.....	7
2.2 Small and Medium-sized Enterprises (SMEs).....	8
2.3 Policy environment.....	8
3. Empirical data: Cases of manufacturing SMEs in India .....	9
3.1 Metal – casting (35 employees).....	9
3.2 Chemical – dyestuffs (60 employees) .....	12
3.3 Food processing – pressure cooker cake mix (5 + 45 employees) .....	15
3.4 Ceramics – floor tiles (65 employees).....	19
3.5 Construction – fire extinguishers (110 employees).....	22
3.6 Textile and garments – blue jeans (80 employees).....	25
3.7 Pollution – micro-algae water treatment plants (14 employees) .....	28
3.8 Food processing – Indian traditional confectionery (200 employees).....	31
4. Analysis and conclusions.....	35
4.1 Trends and patterns in the cases .....	38
4.2 Policy issues – insights for policy makers to consider .....	40
References.....	45
Annexes.....	47
Annex 1: List of questions for semi-structured interviews .....	47
Annex 2: List of companies interviewed .....	51
Annex 3: DFID research questions .....	53



## Introduction

The promotion of innovation in Low Income Countries (LICs) has recently appeared on the agenda of policy-makers and international development agencies. Many agree that innovation is crucial in these countries because it is fundamental for growth in order to catch up with middle and high income economies (Chaminade et al., 2010). Current research, theory development and policy formulation to promote innovation, however, have mainly focused on innovation in the more advanced economies, whilst investigation of these issues in low income countries to date has been limited.

The 5-year research project '*Enabling Productivity and Innovation in Low Income Countries, (EIP-LIC)*' funded by the British Department for International Development (DFID) and commissioned to Tilburg University, aims to fill research gaps on innovation in LICs from an economic perspective. EIP-LIC aims to deliver robust high quality evidence from Africa and Asia on how to increase innovation and raise productivity in manufacturing SMEs, through a coordinated set of thematic and country case studies providing internationally comparable data. The countries of study include Kenya, Tanzania, South Africa, Ghana, Ethiopia, Uganda, Vietnam, Indonesia, India and Bangladesh.

EIP-LIC focuses on manufacturing Small and Medium-sized Enterprises (SMEs) in LICs. Promoting innovation in these enterprises has a particularly positive impact on development (Szirmai et al., 2011); SMEs are usually operating on the edge of the formal and informal sector and have low levels of productivity and competitiveness. Compared to the agriculture and services sectors, manufacturing in LICs is typically characterised by a limited share of the total GDP. Innovation within SMEs in manufacturing enables these enterprises to raise productivity and grow, resulting in a better-balanced economic structure while generating employment opportunities for poorer groups and contributing to poverty reduction.

One part of the project concerns a quantitative analysis of the internal and external factors of the innovation process within firms in all countries of study. Another part concerns a complementary qualitative exploration of the policy and research issues in each country. This involves the development of a series of case studies of manufacturing SMEs. The research output of qualitative reports, working papers and policy briefs are available at the EIP-LIC's website: <http://www.tilburguniversity.edu/dfid-innovation-and-growth/>

This report presents the findings of the qualitative exploration in India. It focuses on Gujarat State only because India is simply too diverse, with too many differences between the states to present a coherent overview from only 15 interviews. The findings are relevant for the DFID project researchers as well as the broader academic community with similar research interests, in terms of providing ideas or supporting them to identify and/or validate research questions and hypotheses. The report may also serve as reference material for reflecting on and interpreting the outcomes of quantitative research in this area. In addition, it may provide useful bottom-up insights to policy makers within governmental agencies, firms and NGOs on innovation from the entrepreneurs' perspective. The report is also targeted at SME owners and SME branch organisations, who will hopefully see their business and socio-economic and institutional context reality accurately reflected.

The structure of the qualitative exploration reports is the same for all countries in EIP-LIC, enabling cross-country comparison of the research and policy issues. Thus chapter 1 is standard for every report, outlining the DFID project research challenges, approach and methodology. Chapter 2, by contrast, focuses on the country of study only and briefly summarises latest trends in the manufacturing sector from secondary sources. Chapter 3 constitutes the main part of the report and provides the original primary qualitative data (cases) and analysis with regard to innovation in manufacturing SMEs in Gujarat in India. Chapter 4 of the report concludes with an analysis of the data and the identification of policy and research issues with special reference to the 'Innovation Systems' and 'Finance for Productivity Growth' research themes of the project.





# 1. DFID research project challenges

## 1.1 Approach: complementing quantitative with qualitative research

EIP-LIC aims to deliver robust high quality evidence from Africa and Asia on how to increase innovation in manufacturing SMEs so as to raise productivity, through a coordinated set of thematic and country case studies providing internationally comparable data. The project takes an econometric approach within two thematic areas: ‘Innovation Systems’ and ‘Finance for Productivity Growth’. The research teams address internal capabilities and external institutional factors, institutions and policies that support or hinder the diffusion and adoption of innovation and finance raising productivity at SME firm level. Specifically, the project takes an ‘economics’ perspective on innovation and involves econometric analysis of a set of variables concerning barriers at the firm, regional and national levels and their causalities with the *innovative behaviour/capability of entrepreneurs* and subsequently innovation and productivity. This constitutes a reductionist and deductive approach in defining variables for analysis in which the impact of individual factors on innovation is assessed by applying quantitative econometric methods. The research methods include firm-level surveys in all countries of study (in cooperation with The World Bank), experiments and Randomised Control Trials (RCTs). The quantitative analysis will serve as a basis for identifying relationships between internal capabilities, external institutional factors and finance on the one hand and innovativeness and productivity growth on the other.

Applying quantitative methods in development research brings some limitations and challenges. In EIP-LIC, conceptual issues emerged in terms of the definition and measurement of innovation and productivity in LICs. These may seem straightforward variables at first glance, but their measurement can be more complicated in the LIC context. Innovation may be manifested differently, not via high profile technological and radical breakthroughs, usually measured by R&D expenditures or patents (OECD, 2005), but by more incremental adoption and adaptation or new combinations of existing technologies (Szirmai et al., 2011). These forms of innovation are equally important for raising productivity and competitiveness of SMEs in LICs.

Moreover, innovation research and theory development in recent decades has typically involved empirical material from advanced economies, such as the innovation systems literature of Lundvall (1992) and Freeman (1987), where innovation takes place within a relatively stable institutional and Science, Technology and Innovation (STI) policy context and is ‘controlled’ and supported by established innovation system actors and innovation policies. In LICs, however, the contemporary institutional realities and formal/informal dual economic contexts are different and may involve other less visible or less commonly known factors and policies around SMEs affecting their innovativeness and how innovation manifests itself.

Therefore, the theory and associated policies of how innovation evolves within an innovation system in the institutional contexts in LICs may be different, which is increasingly acknowledged in recent innovation systems literature (Lundvall, 2009; World Bank, 2010). For instance, entrepreneurs are innovating by Doing, Using and Interacting (DUI) in fast-changing contexts, enabled by informal institutions and informal (social) learning. Applying the research variables on innovation and productivity in LICs from existing literature and theory (deduction) based on advanced economies, therefore, might not take all relevant variables into account. A more precise identification of variables might be obtained by complementing the selection with a broader understanding of contemporary realities and context on the ground in LICs.

Another research challenge in EIP-LIC concerns the interpretation of the quantitative survey research outcomes of the project, involving cross sectional analyses amongst others, where attribution and explanatory issues among independent and dependent variables arise. Although control variables are typically verified, the correlations cannot be easily translated into causalities in complex and dynamic contexts. This is

particularly important for the interpretation of research outcomes at the policy level in the realities of the country concerned. A broader insight into how innovation processes and actor interaction mechanisms evolve might help to open the black box and analyse and interpret the quantitative outcomes.

In an effort to manage these challenges, EIP-LIC includes complementary qualitative research, involving an exploration and description of contemporary realities of innovation in manufacturing SMEs in the LICs. This aims at inductively identifying actual and relevant *research and policy issues* as input for the EIP-LIC research themes as well as for additional explanatory evidence supporting research output.

In operational terms, Tilburg University and partners conducted a series of case studies of manufacturing SMEs in each of the 10 target countries of study in the project. The holistic case study approach and method involves interviews capturing original insights, views and perceptions of SME owners and managers. Similar report format and comparable data will be used for all countries of study in EIP-LIC, enabling cross-country comparison to identify overall trends and patterns in innovation and productivity policy and research issues in manufacturing SMEs in LICs.

## 1.2 Case study methodology

The objective of the qualitative study of EIP-LIC is to identify relevant policy and research issues concerning innovation in manufacturing SMEs within contemporary realities in Gujarat, India. Applying a case study approach is particularly useful in this respect, since this method is an approach for inductively exploring and identifying concepts, noticeable similarities, trends and patterns of socio-economic phenomena (Yin, 2003).

The case study research involves a series of 15 interviews with managers and/or owners of manufacturing SMEs. This may seem a limited number to justify research validity. However, the approach usually involves in-depth rich and detailed descriptions and a multidimensional analysis of the complexities and linkages of a few cases to gain an understanding of the (socio-economic) mechanisms and processes of the case subject. In the case descriptions, innovation as an economic phenomenon is the case 'subject', whereas the unit of analysis is a manufacturing SME. The case description holistically explores the type and basic features of innovation within the SME, and reviews the impact on productivity and competitiveness over the past 2 to 5 years.

The data for the case descriptions are obtained via 'semi-structured' interviews with SME owners and managers. 'Structured' refers to the systematic review and discussion of innovation(s) in the firms, the *innovation process, internal capabilities*, and innovation system actors around the firm, including *formal institutions, the business system and informal institutions* (attached as annex 1). These actors and institutions encompass formal and informal, private, public, and quasi-public institutions or organisations around the SME. 'Semi' refers to the interviewing approach of encouraging owners or managers to tell their story, and express their concerns and perceptions freely, without being confined to the 'questionnaire framing'. Of particular interest is what innovation means in the manufacturing SMEs in their context, and the less known favourable and unfavourable institutional conditions and barriers enabling or preventing it.

All interviews are recorded and transcribed. The data generated are entered and stored using qualitative data analysis software. The writing of the case is a step-by-step process of unravelling, ordering and organising the transcriptions into compact SME case descriptions of 2/3 pages following a similar format. The series of case descriptions are compared and analysed for patterns, differences and similarities in internal capabilities and socio-economic and institutional contexts. The findings are summarised as policy and research issues that could serve as input for the quantitative research of the 'Innovation Systems' and the 'Finance for Productivity Growth' themes under EIP-LIC.

### 1.3 Selection of SMEs and fieldwork

The selection criteria for the cases included:

- The company is a formally registered SME. In the DFID project context, an SME is understood as a company with 10-100 employees<sup>1</sup>, whereas turnover, assets and capital formation are not considered.
- The company is involved in manufacturing. The project follows the International Standard Industrial Classification of all Economic Activities (ISIC). In this standard, manufacturing is defined as the physical or chemical transformation of materials or components into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the worker's home, and whether the products are sold at wholesale or retail. Assembly of component parts of manufactured products and recycling of waste materials are included. Moreover, given the pace and importance of the new technologies, the project considers software and mobile app development as a form of manufacturing to be included in the selection of cases.
- The company is a 100% Indian owned/indigenous company. No foreign or joint ventures.
- The company introduced some form of innovation, preferably process or product, which resulted in increased productivity and competitiveness in terms of export promotion or import substitution. Other types of innovation may also be considered: management, business concept/practice, inputs, functional innovation.
- Value creation within the company, as a result of the innovation, is essential. This may concern a significant productivity increase by reduced costs (pushing the productivity frontier - saving on labour, capital, and input) or more sales and income due to the launch of premium products and competitiveness.
- Innovation process - idea, test, implementation and commercialisation - takes place in the firm and is initiated and owned by the entrepreneur. The SME owner appropriates the additional innovation value.

These selection criteria are defined in such a way that the selected cases represent the EIP-LIC target group: manufacturing SMEs. Moreover, the criteria assure a certain homogeneity within the selected cases, which will enable comparison of cases while supporting a certain validity of the identified trends or patterns. At the same time, allowing some heterogeneity, by including deviant cases, provides more contrast, and thus enables the research team to better construct and highlight divisions in the innovation process, linkages, system or mechanisms.

An essential element of the selection is the notion that types of SME innovation in LICs are not confined to technological (radical) inventions resulting from particular R&D investments and efforts. Innovation in manufacturing SMEs in LICs more often encompasses incremental adoption and adaptation or new combinations of existing technologies, products, marketing, management or business practices. Moreover, innovation often does not concern one type only. More often, an initial innovation enables and/or triggers other types of innovation within a firm; a new technology allows the introduction of new products, for instance.

In the reality of Gujarat, most of the SMEs are at the upper end in terms of the number of employees. It was problematic to identify SMEs in the range 10 – 100 employees. Smaller household and informal enterprises

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<sup>1</sup> It is important to note that one interviewed company, the food processing confectionery company, does not meet the 10-100 employees selection criterion. This company currently employs 200 workers. It was decided to include this contrasting case because of the interesting features during the fast growth of the company. Only 5 years ago, it started as a household business with 7 workers. The fast expansion process of becoming an SME and beyond provides relevant insights for our research, in particular concerning the enabling internal and external factors (in qualitative research such deviant cases are accepted and quite common in its methodology and provide additional richness, in contrast with quantitative research where sample criteria should be observed strictly).

were numerous. This illustrates the ‘missing middle’ of SMEs, which is probably due to cheap labour costs. Several companies only have some 20 fixed workers on the payroll, mostly technicians, managers and supervisors, while their contract teams of unskilled labourers do production work in the factory and related logistics. For these labourers, once a job is completed, their contract ends and a new one is entered into for the next piece of work. These short-term contractual arrangements mean that, in reality, many more people work than those listed on the fixed payroll.

## 1.4 Fieldwork

The qualitative data collection through interviews in Gujarat took place from 4 to 14 December 2016. The Indian research partners identified SMEs in Ahmedabad, Rajkot, Bhavnagar and Morbi. SMEs were identified by tapping into informal and personal networks and drawing information from formal business associations. In total, 16 owners/managers were interviewed (see list attached as annex 2). An average of 2-3 interviews per day was completed. The interviews typically took 1.5 hours.

The research team respected a set of ethical codes in conducting the fieldwork. This involved a transparent explanation of the project and the purpose of collecting the data to the interviewed owners and managers. The research team provided assurance that the firms’ data were kept confidential, with SMEs and interviewees anonymised in the descriptions. Before publication, a draft version of the report was first sent to the SME owner/manager to check whether there were any issues mentioned that he or she did not agree with, or felt uncomfortable with.

During the interviews, the SME owners and managers expressed interest in learning more about the project and about innovation in other SMEs. The team sent a copy of the final report to all interviewees, expressing their intention to maintain contact, and to ‘give something back’ in terms of participation in future policy debates, policy dissemination, contacts or networks. The final reports are to be accessible to the public and downloadable via the project website.

The original recording of the interviews and transcriptions are available for the project researchers - eventually open access under certain specified conditions<sup>2</sup> - for further analysis and development of scientific papers and journal articles.

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<sup>2</sup> The interviews contain confidential information. Interested researchers can use the data only if they assure confidentiality, conforming to the ethical codes applied in qualitative research.

## 2. Introducing manufacturing SMEs in India

India is the seventh-largest country in the world by area and the second-most populated, with over 1.2 billion people. It is 80 percent Hindu but also home to one of the world's largest Muslim populations. India is a federation of 29 states, with a parliamentary system governed under the Constitution of India. Federalism in India defines the power distribution between the federal government and the states. Gujarat is a state in the West of the country, with a population in excess of 60 million. Its capital city is Gandhinagar, while its largest city is Ahmedabad. Other major cities include Surat, Vadodara, Rajkot, Jamnagar and Bhavnagar. Gujarat is home to the Gujarati-speaking people of India.

India's nominal GDP per capita has steadily increased from US\$329 in 1991, when economic liberalisation began, to US\$1,265 in 2010, to an estimated US\$1,723 in 2016, and is expected to grow to US\$2,358 by 2020. However, it has remained lower than those of other Asian developing countries such as Indonesia, Malaysia, the Philippines, Sri Lanka, and Thailand. With its average annual GDP growth rate of 5.8% over the past two decades, India is one of the world's fastest-growing economies. However, the country ranks 140th in the world in nominal GDP per capita and 129th in GDP per capita at PPP.

India has technology and manufacturing sectors as advanced as any in the world as well as traditional sectors characteristic of a lesser developed economy. Extreme wealth and poverty coexist as the nation both modernises rapidly and struggles to find paths to inclusive development for its large and diverse population.

Despite economic growth during recent decades, India continues to face socio-economic challenges. For a long period of time, India has contained the largest number of people living below the World Bank's international poverty line of US\$1.25 per day.

### 2.1 The manufacturing sector

After independence, India was largely dependent on the agricultural sector, contributing more than 50% of GDP. Over the years, India gradually shifted from an agriculture-based to a service-based economy. The manufacturing sector did not grow accordingly, which might be the main reason why the Indian economy has not developed as fast as other economies of the world.

Today, the service sector makes up 55.6% of GDP, the industrial sector 26.3% and the agricultural sector 18.1%. The growth rate for the agriculture and allied sectors is estimated to be 4.1% for 2016-17, for the industrial sector 5.2% and the services sector 8.8%. Major industries include textiles, telecommunications, chemicals, pharmaceuticals, biotechnology, food processing, steel, transport equipment, cement, mining, petroleum, machinery and software. Major exports include petroleum products, textile goods, jewellery, software, engineering goods, chemicals and leather products.

In recent years, the manufacturing sector has been a major focus for the government of India. Realising its importance and the amount of employment it can generate, many initiatives are being set up by the current government to foster the growth of the sector. Having the benefit of a high proportion of educated and skilled labour, there is scope for the manufacturing sector to further develop in the country.

Prime Minister Narendra Modi launched the 'Make in India' programme to place India on the world map as a manufacturing hub and give global recognition to the Indian economy. The programme aims to develop India to become the fifth largest manufacturing country in the world by the end of 2020. The government has

set an ambitious target of increasing the contribution of manufacturing output from 16 to 25 per cent of GDP by 2025.

## 2.2 Small and Medium-sized Enterprises (SMEs)

SMEs have played a vital role in India's economic growth and development in recent decades. With over 30 million units in the country, they accounted for 17 per cent of Indian GDP in 2011 and currently employ 60 million people.

The importance of SMEs in the manufacturing sector is due to their significant contribution to the key factors of the growing Indian economy. According to the Small & Medium Business Development Chamber of India, SMEs currently contribute 45 per cent of the nation's industrial output as well as 40 per cent of total exports. They form 95 per cent of the total industrial units in the country and manufacture around 8,000 quality products for the Indian and international markets.

## 2.3 Policy environment

The government recognises the importance of SMEs for the overall development of the country and has policies and programmes in place to support their development. A major hindrance in the expansion of SMEs is the unavailability of sufficient and timely funds to finance investment and availability of technology and technology development. In response to this, the National Manufacturing Competitiveness Council (NMCC) implements schemes to develop the global competitiveness of Indian manufacturing SMEs, including the following sub-programmes:

- Lean Manufacturing Competitiveness Scheme: aims to reduce manufacturing waste and increase productivity and competitiveness.
- Design Clinic Scheme: enables MSMEs to avail themselves of expert advice and cost-effective solutions for real-time design issues.
- Marketing Assistance and Technology Upgradation: focuses on upgrading technology for increasing competitiveness in marketing.
- Technology and Quality Upgradation: aims to encourage SMEs to adopt global standards for improving the quality of goods.
- Promotion of Information and Communication Tools (ICT): focuses on encouraging the adoption of ICT technology by SME clusters, which have been delivering world-class products and, therefore, have the potential for growth in exports.
- Awareness on Intellectual Property Rights (IPR): aims to foster Indian MSMEs to attain leading positions globally and seeks to empower these units with the IPR tools to protect their innovations.

An important policy context for SMEs in India concerns the demonetisation campaign, launched in November 2016, to reduce bribery and the black economy. The idea is that India shifts towards digitalised money transfers, which are more traceable and taxable. The government announced the demonetisation of all 500 rupee (US\$7.80) and 1,000 rupee (US\$16) banknotes, claiming that this action would curtail the shadow economy and crack down on the use of illicit and counterfeit cash to fund illegal activity and terrorism. The sudden nature of the announcement—and the prolonged cash shortages in the weeks that followed—created significant disruption throughout the economy.

### 3. Empirical data: Cases of manufacturing SMEs in India

This chapter presents eight cases of SMEs whose owners were interviewed in Ahmedabad in the period 4 – 14 December 2016. The selection of eight out of the fifteen interviews was completed with a view to providing homogeneity in terms of the SMEs in manufacturing as well as to present a broad overview of the issues from the various SME owners' perspectives. The write-up format is similar for each case: a description of the innovation, the internal capability and external environment (formal institutions, business systems and informal institutions). Notable issues outside this framework, which were stressed by the owner and/or manager of the SMEs, are also included.

#### 3.1 Metal – casting (35 employees)

The company manufactures metal rings for bearing cages, which are sold as intermediate products to the machine and automotive industries. The company was established in the 1990s by a metallurgist and his commercial partner, who set up the centrifugal casting foundry. The interview is held with the present owner, who also acts as director.

The company uses a centrifugal casting procedure to produce the cages from copper based alloy. *“The high-end bearing industry uses centrifugal casting only for cages.”*

Raw copper scrap is melted in an induction furnace and then poured into a rotating mould. According to the director, centrifugal casting for producing high quality bearings components is a relatively advanced technology, combining three technical fields of expertise: chemistry, mechanics and metallurgy.



The metallurgist and his commercial partner performed well in terms of product quality and technology, but not as regards financial performance: the company was making serious losses. The key issue was the high production cost and an inefficient centrifugal casting process. However, because of the high product quality, the metallurgist secured a solid market position by becoming a supplier to a large international bearing manufacturer nearby involved in precision engineering. This large buyer was looking for advanced centrifugal casting producers and was willing to provide some credit to the company to temporarily offset the losses. The management of the large company assumed that after a period of time they would recover their financial outlay *“but that day never came.”*

At that time, the present owner was trading engineering tools and supplying to the company. He established a good relationship with the metallurgist and his commercial partner. In 2000, they asked him to join them in the manufacturing business. He was interested *“because I am always ready for new challenges, but at that time I did not know about the big losses in this company.”* A decisive factor was the fact that the company was *“a dedicated vendor”* to the large international bearing manufacturer, which gave him sufficient trust and confidence in their ability to generate future business.



The present owner himself was also in a weak financial position. Even after he found out about the losses, he decided to stay in the business because of the relationship as an important supplier to the large manufacturer. The company had to enlarge production capacity with a new workshop at another location nearby. In 2002 the present owner became the 'caretaker' of the new workshop.

The large international bearing manufacturer was impressed by the production volume and quality of the new workshop and contacted the 'caretaker' – *"I had been waiting for three years for this moment."* The representative discussed with the present owner a plan to recover past debts. The large enterprise was able to make the present owner an authorising signatory – *"they gave me this whole factory with some machinery and I started in April 2003."*

Then, in 2008, the metallurgist and original owner left the company. The present owner took over the remaining debt to the large international bearing manufacturer and paid 1.75 crores (275,000 USD) goodwill to the metallurgist. He signed a new agreement with the large international bearing manufacturer for 50 tonnes minimum of business per month and a repayment arrangement for the debt. After 5 years, in 2012, *"I was clean."* The company acquired new customers, became profitable and now *"it is a very healthy company."*



#### *Internal capabilities and innovation*

At present, the company has 35 employees in the foundry and 7 office staff. Since the present owner became involved in the company in 2000, the product and centrifugal casting technology have changed little, but he did change the management and administrative processes. He does not have an *"ego problem"* as he puts it: he sits down and talks with the workers while observing what is going on.

Among other things, the present owner spends a lot of time with the workers in the foundry to understand the production process and technical details. Not being a technician by education, *"I am simply a business graduate,"* he asked the workers how to improve the production process. One problem is that the process of melting and re-melting the costly non-ferrous (copper based) material implies burning losses due to evaporation – *"a certain loss is allowed."* If the production process is well managed, the loss can be kept as low as 6% and then the business becomes profitable. The foundry workers suggested several technical improvements, such as lowering melting temperatures, which resulted in less burning losses in the production process. *"At that time I learned a lot from the workers. Only they know how to do it right."* The new management style was different from the previous owner, the metallurgist, who used to tell the workers what to do, so *"there was a lot of conflict."*

Another new practice was the switch from an oil fired furnace to an induction one, an electricity based process for melting copper. His neighbour and friend advised him to buy an induction furnace from him *"because an induction furnace is a must for this industry."* In 2005, he bought the first induction furnace. They connected it to the continuous centrifugal casting machine, which nobody was doing in India. This was quite a technological invention – *"I told my neighbour and friend that if we succeed, then we should not make another furnace. I don't want my competitors to have this technology."*

### *External business and institutional environment*

Initially, the company only supplied to the large international bearing manufacturer, but today the company has ten different clients – *“there is a very big market in India and very few competitors in centrifugal casting.”* The director says that only five companies are involved in centrifugal casting in India, but these other companies operate on a smaller scale and are not serious competitors.

The company does not export, although the products are sold in Germany via the international bearing manufacturer. One German buyer once visited and audited the company – *“they know I am the manufacturer.”* Demand from the international bearing manufacturer has decreased somewhat because it now has its own foundry. The owner is not concerned about competition because the international bearing manufacturer only produces for its own use – *“they don’t want to do anything for others.”*

Regarding the institutional context, the director says that he is content with the policies and regulations of the national and Gujarat state governments – *“if you are doing anything wrong then there is a problem.”* He finds the fourteen government departments that regularly come for audits a bit excessive – *“every month some government inspector comes here checking labour conditions, electricity, safety and pollution.”* In the past, it was quite common to offer Diwali<sup>3</sup> presents to government officials to maintain a good relationship but *“now our Prime Minister Modi is doing a great deal to counter corruption.”* There are fewer inspections, which makes the owner happy. The government officials never harassed the owner – *“only if you are doing anything wrong with your books will they punish you.”*

Fifteen years ago, the infrastructure, road and power supplies were very bad, according to the owner. There was power for only five or six hours per day, which *“made it impossible to run a company.”* In 2001, Modi, as past Chief Minister in Gujarat, addressed these problems seriously and since then the infrastructure has improved daily *“and now things are going smoothly.”*

When he took the decision to take over the company in 2008, *“my liabilities were higher than my assets and I was the only person who knew this. I took a risky decision in taking over the company.”* His family, quite poor, was not aware of the risk – *“if anything went wrong than we would all have been on the street.”* At first, he went by bicycle to work. Since the company began to thrive, he has owned several cars. Today his family is fortunate and still does not believe the success and the wealth they have.



The informal advice of his neighbour and friend has been very important. An owner is a non-technical person – *“anytime I ask him for a technical problem, he comes within 10 minutes and resolves the issue.”* Over time, he learned that one person cannot manage a business – *“you need at least two people, one technical and one commercial.”* The owner has the ambition to reach a much bigger market in five years’ time. He hopes to do it with his neighbour and friend and sees a golden future together – *“in five years we will just sit and monitor the production.”*

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<sup>3</sup> Diwali is the Hindu festival of lights, celebrated every year in autumn in the northern hemisphere.

### 3.2 Chemical – dyestuffs (60 employees)

The company produces dyestuffs as intermediate inputs for the paper, textile, plastic and leather industries. The company has its main office in the city centre of Ahmedabad, where management, administration and sales are handled. Its factory and a small laboratory are located in Naroda, an industrial area on the north east side of the city. The interview is held with the owner (and director) of the company<sup>4</sup>. *“We have business in our family genes: my grandfather ran a small shop and so did my relatives.”* The total work force of the company is 60.

The production of dye making is a straightforward chemical reaction process. Dry input substances are mixed while controlling for acidity and temperature. The mixture is then filtrated and the liquid is dried into dye powder as the end product. The company does not produce food dyes because of the limitations of their current machinery, which cannot purify the dye sufficiently.

Seventy years ago, the owner’s grandfather came from Rajasthan (Bharatpur) to Ahmedabad. His father was working as a service engineer in a government textile mill. The owner graduated in chemistry from a well-regarded college in Ahmedabad. After graduation, he worked in Shanghai (China) for almost 10 years, managing a branch of his cousin’s dye business. In 2010, he moved back to Ahmedabad and started his own dye business – *“I have working experience in the two giants of Asia: China and India.”*

Right from the start, he exported a large share of his production, helped by his earlier experience and contacts from China. Today, the company has an export manager who travels around the 22 export countries in Latin America, Europe, the US, Canada and Asia. The owner is still trying to expand the market by promoting products at exhibitions and searching the internet. The company has a website, *“which is obsolete. We don’t do online selling.”*

The company is currently building a new factory. The owner envisages hiring up to 100 more production workers. The current management administrative staff is sufficient to handle and control both the old and the new factory.



#### *Internal capabilities and innovation*

Apart from his chemistry educational background, the director has attended several management training courses over the years, in particular in economics, HRM, accounting, finance, law, entrepreneurship and innovation. The owner sees the importance of lifelong learning and continual upgrading of his knowledge and skills – *“last year I took one short term course at IIM [Indian Institute of Management] on how to create a global enterprise.”* He sees an important advantage in having both his commercial and technical knowledge developed – *“having an educational background in commerce does not mean that you perform well. Having a technical background is also critical.”* The director is directly involved in R&D work in the laboratory. He sits down with the company chemists and discusses technicalities of compositions and the purchase of raw materials.

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<sup>4</sup> Mr. Vinod Agrawal agreed to disclose the name of his company: Arunaya Organics Private Limited ([www.arunayaorganics.com](http://www.arunayaorganics.com))

The owner says that he has loyal workers, and indeed, staff turnover is low. One of the reasons is that *“we pay much higher than the industry standard.”* The company provides health insurance for the workers and continues to pay a worker’s salary if they are absent for 2 or 3 days – *“we always give the workers 100 percent salary.”* The owner, however, sees a problem with the productivity of Indian workers compared with his experiences in China – *“in India, we cannot get the Chinese efficiency. The Indian worker produces one third of what the Chinese worker is producing.”* According to the director, Chinese workers are much more disciplined and punctual.

The owner is trying to raise productivity and organises regular meetings with the staff. *“We sit down and everybody outlines whatever problems they have. This prevents internal fights.”* In these meetings, the director emphasises the company values, such as honesty and trust, building good relationships and transparency of communication. This is also how he deals with his customers, which is partly why he believes he survives well in the business. The director is open with customers – *“if any problems occur, we tell them openly.”*

The company has introduced the production of salt free dyes in recent years. This is a state-of-the-art advanced technology. Salt free dyes are manufactured using a membrane and reverse osmosis technology, removing salt and other impurities, which enables the production of high concentration dyes. The removal of salt increases the solubility of dyes and is more environmentally friendly since fewer chemicals are used in production.

The salt free dye *“was already out there in the world.”* Some companies in Ahmedabad had previously introduced the technology. In fact, it was not such a difficult process to introduce in terms of technology. However, the owner sees that it is more difficult to convince the staff to adopt new ways of working – *“they want to continue only with the traditional ways. To change the mind-set of the staff takes a lot of time.”*

The salt free dye has a higher selling price *“that initially nobody was willing to accept.”* One reason for introducing the salt free dye technology was the need to comply with stricter environmental regulations set by the government, *“but it is also self-imposed, otherwise you cannot survive as an industry in the long run.”* The sales team started to encourage customers to use environmentally friendly products, and sometimes technical staff were sent to the customers to offer free trials. The customers understand that they will also face environmental problems so *“now they are ready to accept the higher price.”* The owner explains that 100% natural inputs are technically possible but not economically viable.

#### *External business and institutional context*

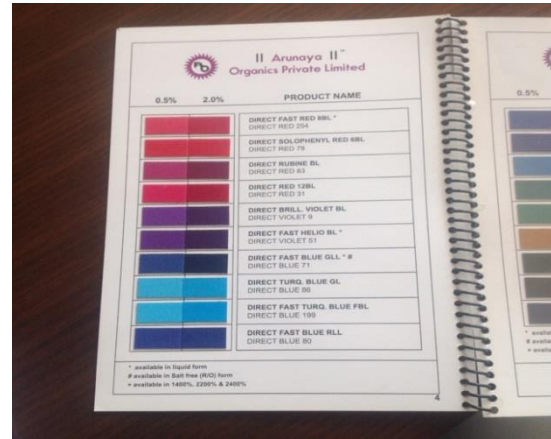
The industrial area in which his factory is located is a cluster of some 70 dye producing SMEs. Suppliers of inputs are located in the same area. Dye production requires many different inputs such as ice, steam, soda and other raw chemical materials. Short transportation lines are essential to keep the business profitable – *“a single industry would not survive.”* Most of the owners of the SMEs are relatives of the owner – *“family members help you with everything.”* The owner explains that there is no possibility of growth in the cluster. The government does not issue new licences for the establishment or expansion of a business *“because it’s a very polluting industry.”*

The owner explains that the dye industry is concentrated in two locations: China and India, and particularly Gujarat State – *“Ahmedabad is a chemical hub.”* Seventy percent of the dye production is exported and only thirty percent is sold on the domestic market. The reputation of Indian products has improved greatly on the international market. Some fifteen years ago, Chinese customers, for instance, believed that Indians cannot



produce dyes – “as a result, some Indian producers packaged their dye products under Italian names, which sold well to China. Now India has evolved into a premium brand.”

The owner does not consider the other dye-producing SMEs in the cluster as competitors, “because every factory has its own specialty colour, and there are hundreds of colours for sale.” The owner specialises in blue – “I do not go for big volume products, only small quantity and high value. That’s my company strategy.” If a company in the cluster has a contract with a client for different colours, “then we buy from the others in the cluster. Our business is like a supermarket. People come and choose.” Sometimes the owner subcontracts the manufacturing of special colours to a smaller company.



The owner feels he is doing business differently than the other SMEs in the cluster because of his educational background in chemistry – “90 percent of entrepreneurs among the 700 companies do not have a technical or science background.” They mostly have a background in commerce, with little experience outside India.

The environmental challenge is water pollution. In the past, the industrial area was relatively far away from Ahmedabad and polluted water was discharged into the local watercourses. Now, a number of residential areas have been established in the area and “operating a polluting industry is not easy nowadays. We are watched and under surveillance all the time.” The key challenge is to process the volume of polluted waste water – “there are technologies available, that is not the problem, but the volumes are so large.”

As a permanent solution, the companies in the cluster are jointly building a water treatment plant, which is centrally located in the cluster. All the dye-producing companies are connected via pipelines and discharge their polluted water into the plant – “as an individual company, we have to pay a charge per litre.” Water treatment is a government requirement. All the SMEs in the cluster invested in the water treatment plant.



Dye production in China is diminishing because of the pollution issue – “that’s good news for our Indian dye industry.”

According to the owner, the Chinese companies were not listening to their government and directly discharged waste water into rivers. The context in Ahmedabad was different when Narendra Modi came to power in Gujarat 7 years ago – “he regulated environmental protection policies, enforcing the rule that either you behave properly or go away. Those were his words.”

The owner feels that the business and institutional environment has improved in Gujarat – “we have confidence in the government and the economy. We are going in the right direction and the government has developed the right policies.” The government, however, is slow in implementation – “not at the level that is required.” The infrastructure such as roads and electricity has improved a great deal, according to the owner.

The owner has never asked the government of Gujarat for subsidies *“because subsidies create beggars. I don’t support subsidies for our business.”* The view of the owner is that the government should facilitate business and not interfere or make things more difficult. That means less corruption, less paperwork and documentation and fewer licences.

The owner is a member of several associations, such as the Gujarat Dyestuffs Manufacturers’ Association (GDMA). GDMA addresses problems and challenges in the industry and suggests possible solutions to government – *“sometimes it is successful and it helps. Not always.”* Issues include tax, import and export duties, Chinese dumping of dye products on the Indian market, and the effects of trade agreements such as AFTA, SATFA, and the SAARC countries.

The owner is also a member of the Naroda Industrial Association (NIA), the Gujarat Chamber of Commerce and Industries (GCCCI) and the Confederation of Indian Industries (CII). All these associations serve the interests of the industry – *“they overlap.”* The owner spends an average of 4-5 hours per week attending meetings of these associations and considers this an important learning opportunity – *“being part of this forum, you can predict the government’s next move, so it is good for your business in the long term.”*

According to the owner, the service sector’s share of GDP in India is 60 percent, whereas manufacturing is only 12 percent. He considers this an imbalance because the service sector is a support sector – *“60 percent of the people are dependent on 12 percent.”* The owner is happy with the government’s current policy, which focuses on manufacturing. The government foresees an increase from the current 12 percent share of manufacturing in GDP to 25 percent – *“that is why I am very optimistic about SMEs and manufacturing in India.”*

There is less corruption these days in India – *“in the past, you put some money on the table and then the problems were solved.”* The owner sees a very positive impact of the digitisation of interactions with the government in taxes, licences and pensions, for example. Online applications involve less human interaction and decrease the chance of corruption.

The owner sees a serious weak point in the connection with science and technology in India. Universities are not doing relevant research for the industry – *“the research serves only to complete their theses, which is the theory part.”* The owner argues that in the field of engineering there is no innovation within Indian technology institutes – *“they only re-engineer and re-invent, basically copying, they don’t innovate.”* Similarly, in his company’s R&D department, his staff find out how a certain dye is produced elsewhere, and then copy it – *“the company does not do innovation because the right people are not available.”*

The owner feels that in the Indian education system only theory is taught, not practice or practical approaches – *“really there is no link between education and industry.”* In India, there are good connections from industry to government and from education to government, according to the owner, but not from education to industry. The owner also teaches entrepreneurship for students aiming to set up a business after graduation. *“India is at a point where you cannot waste time.”* Overall economic growth is very fast – *“I believe if entrepreneurship is there, business is there and poverty will automatically go away.”*

### 3.3 Food processing – pressure cooker cake mix (5 + 45 employees)

The company produces instant cake mix for domestic pressure cookers. A 22-year old female entrepreneur established the company in January 2016. She produces and packages the cake mix in a production unit in her family home on the outskirts of Ahmedabad. She works with her parents, three female employees and a network of 45 part-time sellers. The interview is held with the female entrepreneur.

The idea started when she was a child – *“I always had the dream to bake cakes and find out how it all works.”* Because she did not have an oven at home, she started to experiment with using a pressure cooker. Finding out the best cake mix composition and the temperature was the challenge. She finally managed to develop a formula for the mix and the procedure to bake it – *“it took me 3 years to get the perfect cake mix for a pressure cooker.”*

### *Internal capabilities*

The business idea came some years ago when the family’s income dropped. Her father was unfortunate with a business venture in Bangalore, where the family stayed for a period of time during her youth. Back in Ahmedabad, where they are originally from, her father tried unsuccessfully to find a job and to set up a business. *“My father told me that he couldn’t pay for my university fees.”* During her BCA (Bachelors in Computer Applications) study, she, therefore, worked for an educational institution teaching maths and science, which helped her family and enabled her to save some money – *“I had to struggle a lot.”* She managed to enter the postgraduate master’s programme at Ahmedabad University – *“I was proud to tell my father that I could afford that.”*

Once she managed to bake a cake in a pressure cooker, she got the idea of selling the mix on a commercial basis – *“every household in India has a pressure cooker. Only a few have an oven.”* She did market research and found that there are only a few cake mix products on the market from well-established bakery companies in India, such as Pillsbury and Fun Foods. She tried some of these products, but they were *“less than good,”* according to her.

She began to seriously develop plans to establish a company – *“I thought if I started up my own venture, I could help my family to balance the family income.”* Her parents, however, were concerned because she was still studying for her MBA – *“initially there were lots of questions which I had to figure out by myself.”* She also needed some start-up capital for professional mixing and sealing machines and working capital for input materials. She was thinking of taking a loan through a women entrepreneurs’ credit scheme, but she feels that paying interest is a waste – *“in the end, I will be left with nothing.”*

She decided to talk to her parents about investing part of the family savings. Initially, her parents were reluctant and they had a lot of discussions, but eventually, she managed to convince them – *“communication with family members and others around the business is essential.”* They agreed to take the risk. All her own and her family’s savings were invested into the business. On the one hand, she was concerned about the risk – *“what if it does not work? If we fail, then we are doomed.”* On the other hand, she thought that *“if I don’t take the risk right now, then I will never take a risk in my life.”*

When the company was established a year ago, together with her mother and three other women, she produced an average of 50 packages of cake mix a month, which she sold for a fixed price of 160 rupees (2.50 USD) per package. Her father left his job to work for the business too, managing the finances, registrations and licences.

At present, she produces seven variations of cake mixes and produces an average of 600 packages per month, which she sells through a network of distributors. The price on the package includes the margin for the distributor. For the time being, she is keeping her profit margin low in order to increase turnover. She first wants to expand her customer base and improve her brand recognition in the market – *“even if I get less profit, then it is fine.”* Nevertheless, the business has been successful up to now and her business is generating the entire family income.

At present, she combines the business with her MBA studies, in which she is majoring in human resources. She has gained little insight in marketing or finance. In fact, she does not see a need to study marketing in order to make a product and sell it – *“it is just instinct.”* She feels that academic theory and practical business reality are very different. If she gets an offer for a good office job, she will try to combine it with the business, but has no intention of stopping the business.

Her parents are now fully involved in the company – *“it became a family business.”* In the morning, she goes to college and in the afternoon, she works in the production of the cake mix packages – *“my mother helps with that.”* She does not want to share her formula, which is not even written down – *“I am not going to tell anyone. Just my mother and I know about this.”* She employs three women from her neighbourhood – *“being a woman, I understand that I might help other women to earn something.”*



The women do not have a fixed salary, but take a commission for each packet – *“it is up to them how many they want to make.”* Her father manages the finances, licences and other necessary paperwork. He is not seeking other jobs as he is fully convinced that the cake mix will become an important product in the future, *“so why not put everything right now into this?”*

The business is still growing because *“we invest all our profits in the company.”* She expects to produce and sell 1,000 packages per month within the next year. In that event, it will be necessary to set up an extra physical production unit. She also wants to improve the packaging and to sell the cake mix in small cardboard boxes – *“that would be the perfect packaging.”* She has noticed that the growth of the business goes along with earning a reputation. She sees that her parents are very proud of this. Indeed, recently she has received calls and orders from Mumbai.

She does not sell her products via regular shops or supermarket channels. She finds the conditions unattractive because she only gets paid after the product is sold. She cannot afford to invest her money upfront in stock in the shops *“and wait for two months to get paid.”* Instead, she has established a network of distributors, women who gather groups of friends, family and neighbours for a cake demonstration – *“it’s like a Tupperware party.”* The cake is prepared and baked during the demonstration – *“we make them taste the product, and ask for feedback.”* She found it difficult at first to sell the product because people were reluctant – *“how could they trust a young girl?”* It is not until they taste the final product that they are convinced, and in this way *“word of mouth spreads quickly.”*

In January 2016, she had five female distributors. By December 2016, she had 45 and is still expanding. *“The more women reach out, the more my business is going to expand.”* The distributors are women from lower and middle class families in a few residential areas in Ahmedabad. *“Over the next 2 years, my plan is to expand to the whole of Ahmedabad.”* She believes that once the cake mix is known in the city, it will be easier for her to go out to other cities in Gujarat. There is also a *“helpline number”* on the packet, which is her mobile phone number. She gets around 10-12 calls per day for orders and questions about how to prepare the cake.



She has several female distributors who are from traditional families. Their husbands do not allow them to go out, so these women organise demonstrations in their homes and *“contact their friends, family and neighbours through the phone and WhatsApp.”*

#### *External business and institutional context*

She buys the raw materials from vendors in Ahmedabad. She has identified quality providers with reasonable prices, who are her regular vendors. She can order small as well as large quantities, *“and they will deliver it to my doorstep.”*

She has a trade mark for the cake mix product name but did not take out a patent for the product, which she felt involved too much money in applying *“and I need to show them the formula and all. I am reluctant to do so.”* She does have a licence for food production. She can use her brand name for baking products and she can set up a shop with the food licence. The local government agency issuing the licence asked for the product and supporting documentation. The government officials did not come to her home production facility to check but *“they will come in the near future to check, they told me.”*

She has formally registered her company, which turned out to be a long and complicated procedure. She started to apply in July 2015 and it took her 6 months, several different government offices and a lot of paperwork. The government officials asked a lot of questions, even personal ones such as *“why don’t you get married?”* She needed proof of residence, a physical office address, a bank account in the name of the company, and so forth. She did not manage to get all these documents sorted out because she is too young. Her parents then suggested registering the company in her mother’s name. She could have paid *“some money under the table”* to speed up the application processes, but she could not afford it – *“that is why it took me so long to get the licence.”*

Regarding other formal institutions, she knows about the Gujarat Chamber of Commerce & Industry (GCCCI) that assists women like her in setting up a business. She visited their office and talked with many staff members. However, she quickly realised that *“all they want to do is to show others that they are great without doing anything.”* She does not feel comfortable seeking support from the GCCCI and is unaware of any other support associations for women entrepreneurs. In any case, she thinks that most business associations are only about glamour and personal competition – *“they want to show that they are better than the others.”*

She receives mixed reactions in her social environment about her business: *“80% of people are supportive and 20% of them push me down.”* Her neighbours have *“question marks all over their faces.”* They wonder why a young female MBA student would set up a business – *“people expect me to get married, or get a desk job in some good company.”* Her relatives never ask her about the business during family functions – *“they do not take me seriously. They say it is not going to work, that I am wasting my time.”* Sometimes she feels like telling them that this is none of their business.

She would consider getting married, but only to someone who is supportive or would help her with the business – *“if he wants to be involved, I am fine with that. If he wants me to run this independently, more than fine.”* She is a free and independent woman and she wants her space to run her own company. Her parents have allowed her to choose a husband by herself, but *“if I cannot find a guy within three years, then my parents will start to look for a husband for me.”*

She sees a particular challenge for women entrepreneurs in India – *“people put their trust in a man more easily.”* She feels that people have a preconception that *“men in business know what they are doing.”* There are a lot of male egos involved. She is happy to see that some women buy from her *“because they want to encourage me.”*

Very few of her contemporaries have started a business. In her university, she is the only one. She once showed her classmates what she is doing because she is proud of it, but *“they started laughing at me and asked me why I wanted to do this.”* She thinks that if she were a man, her classmates would not have the same attitude – *“there are very few people supporting me in my college.”*

### 3.4 Ceramics – floor tiles (65 employees)

The company produces vitrified floor tiles and has its own brand name. It is located in the small town of Morbi, a cluster of 700 ceramics and tile producers, some 250 km west from Ahmadabad. The interview is held with the owner.

The owner previously ran another company in Morbi producing small-sized wall tiles – *“we closed that enterprise because the machinery and technology were outdated.”* He started to produce floor tiles instead because *“day by day the demand for floor tiles increased, so we choose floor tiles.”* The 60 x 60cm and 120 x 60 cm tiles are particularly successful products – *“only 3 or 4 companies make these tiles in Morbi.”*

The owner started this company in 2012 with 60 employees. He financed the furnace, kiln, machines and equipment from a combination of bank credit and investment money from the family. From the beginning, the business did well and he enjoyed substantial growth in sales and revenues. The owner has seen *“domestic market growth of 10% and export market growth of around 25%.”* He started to export in 2014. Today, thirty percent of the company’s products is exported, mostly to the Middle East, while the other 70 percent is sold in the domestic market. There are Indian merchants who buy and export the tiles as middlemen. Alternatively, the owner exports directly.



The owner is not planning to increase exports, which are less profitable than domestic sales because of international competition – *“we have to compete with China, which is why we set our prices low.”* In addition, the production cost of ceramics is never constant. The designs and shapes are different and *“sometimes there are production problems, so the costs go up.”* He keeps exporting to spread the risk of market fluctuations. When domestic demand slumps, *“if there were no export market, then we would have to close the company.”* The export orders are usually large bulk orders, which is easy for the company. *“We get 50% payment in advance and mostly the payment is guaranteed, so that is a very easy business.”*

#### *Internal capabilities and innovation*

The owner has a BSc degree in chemistry. After graduation, he went into his family business – *“fathers have businesses and, as sons, we have to be with them.”* His educational background enables him to solve most of the technical issues in ceramics production, such as glazing procedures or material problems. For more operational issues, he has several workers with long-term expertise. Most of them do not have a formal technical education but *“they can solve the problem with their experience.”*

The tile production requires a lot of workshop space. The total production facility is 260 meters long, of which the kiln production line alone measures 170 meters. The raw materials from Rajasthan are mixed with water in a mill. The “*slurry*” is then put into a dryer to prepare the base clay, which is pressed into a mould in the shape of the tile. The unbaked tiles are put on the kiln production line, where texture and colour layers are put on the tiles before they go into the kiln for the final baking.



Normally, production continues 24 hours a day, 365 days per year. The owner forcibly stops production only for maintenance procedures – “*the furnace has a temperature of 1,200 °C and requires three days to cool down and another three days to start up.*”

The company uses state-of-the-art production technology. The machinery was installed in 2012 and came from China and Italy. Since then, nothing in the technology has changed. The owner is constantly trying to decrease labour, energy and other production costs. Energy costs are the highest in the production process, particularly the firing of the gas kiln and electricity for the installations. The gas price fluctuates depending on the dollar price – “*if the dollar goes up or down, our gas price goes up or down.*” The owner is not aware of any new technologies which might save on production costs.

The company continually researches new technology and designs at exhibitions in Europe and China, where they “*look at the products they have and try to make them here.*” Within the cluster, “*everybody is looking at everybody. Ceramic products change all the time.*” The company needs to keep experimenting with new tiles and new materials every day.

Ideas for new designs come via their marketing channels all over the world, from suppliers with particular original raw materials to produce a special tile, from buyers, or from other SMEs in the cluster. There is no special innovation unit within the company or high expenses involved, just a few experimental samples added to the production line. The owner accepts the risk of producing new tiles in small quantities.

The owner then sends a sample of the new designs around his network of customers – “*I have 300 customers. Before I start a new product, I wait for orders.*” The owner negotiates the price, bearing the production costs and a margin in mind. He knows the lowest price he can afford, and will not go below that.

It is very likely that competitors in the cluster will copy successful designs, but a competitor needs at least 3 months to source the necessary raw material input, organise production and bring the copied design to the market. Within that time frame, “*I will earn good money.*” Some companies in Morbi ask for exclusivity from the raw material suppliers to protect their design – “*we ask them not to provide input material to anybody else for at least 6 months.*”

The company has a production line, which requires relatively few workers since input materials come on the line automatically. Today, the company has 65 fixed workers. Some of the permanent skilled staff have a high degree of technical knowledge and experience to operate and maintain the machines. The majority of the workers are unskilled labourers, refilling input containers, carrying and packaging tiles. The company also engages contract workers, often migrants from other provinces – “*I deal with one person. He comes with his team of labourers and does the agreed work.*” The number of contract workers depends on the type and amount of work required.

There is little in-house training. The company mostly recruits experienced workers from other companies, and sometimes its own experienced workers are contracted by other companies. The owner sometimes pays higher wages in an effort to keep the workers.

#### *External business and institutional context*

Morbi is a well-known ceramics cluster in Gujarat. The owner estimates that eighty percent of all households are working in the ceramics subsector in one way or another, mostly in family-owned businesses. The companies have different products and production processes – *“some companies have higher quality than ours and some have lower quality.”* The differing quality and prices allow customers to choose from a wide range of ceramic products, including wall tiles, floor tiles, polished porcelain tiles, sanitary ware and mosaic tiles.

There is regular interaction between the family-owned companies in the cluster. Family members help each other in starting up a business. When the owner did so, he went to a relative *“and asked what machinery is good, which supplier is reliable. We all share technical experience and knowledge.”* In the cluster, there is also a lot of competition. The traders ask for quotations at different companies and *“every time there is a lot of price negotiation involved.”* The company owners never discuss business deals or commercial details among themselves.

In recent years, Morbi became an important outsourcing location for large international ceramic manufacturers. Multinational companies like HR Johnson, Indian Kajaria Tiles, Asian Tiles and Somani Tiles do so because the production costs are cheaper in Morbi, while the quality of the ceramic products is up to international standards – *“we are getting very competitive here. Our production technology and practices are very good.”* Some foreign companies and suppliers have also established production facilities in Morbi.

The relationship with suppliers of raw input materials is important for innovation ideas and technical advice. There are several European suppliers who enable the SMEs to produce new designs *“like they are producing here.”* They supply original raw materials and suggest ways produce a new design. The relationship with the machinery and equipment suppliers is equally important. If there is a sudden technical problem, *“then the supplier of the technical input has to be on the line right away.”* The suppliers also operate in a competitive market and they have technical staff on 24/7 stand-by – *“after-sales service is essential and an important part of their competitiveness.”*



The owner finds it easy to operate in the institutional and regulatory environment. He mentions that the Gujarat state government is mostly supportive – *“we have very flexible labour laws, we get cheap input, it is all very cost effective.”* Setting up a new tile company in Morbi and getting the necessary permits can be completed within 6 months. There is no restriction in terms of the number of business licences. On the other hand, the government imposes strict environment regulations – *“we can't burn coal for our production, for instance.”*

The owner says that there is some degree of corruption within the government. He considers some form of irregularity acceptable and understands that government employees also need some additional income. This is not a significant hindrance and government officials will not block procedures, but *“some additional money will speed up the processes.”*



There are no contacts with university-based technology institutes for developing new ceramics, baking technologies or improving glazing chemistry. There are some vocational training centres and institutes that train production and operations engineers.

The ceramics producers in Morbi formed a ceramics association, which interacts with the government on policy issues and rules and regulations. According to the owner, the government is open to suggestions and discussions *“because we employ a lot of people and we generate a lot of revenue for the government.”* Among other matters, the association has suggested that the government should establish an anti-dumping policy for China. Chinese products are cheaper and their quality is equally good so *“they can bombard India with cheap products if they want.”*

### 3.5 Construction – fire extinguishers (110 employees)

The company produces fire extinguishers for commercial and domestic use. The production facilities and main office are located in Shihor, a small town in Bhavnagar district in Gujarat, some 180 km south of Ahmedabad. The company has a large sales and marketing office in Mumbai as well as smaller sales offices in several Indian cities (Ahmedabad, Delhi, Hyderabad and Kolkata), supplying to retailers and dealers and to large corporates. The sales offices have warehouses nearby to expedite delivery times. The company has several teams installing extinguishers and providing customer service, with 110 employees in total. 60 people work in the production and a further 50 in the various sales offices. The company is owned by two brothers. The interview is held with one of the brothers.

The interviewed brother had run carbon dioxide production facilities before. His plant burned kerosene and wood, generating steam and capturing carbon dioxide. *“Clients from Mumbai and the South were sending us empty fire extinguisher cylinders to be filled with carbon dioxide.”* As a small-scale carbon dioxide producer, he was aware that his market was limited to a small geographical area. He realised that producing fire extinguishers by himself would offer much greater business potential. He anticipated marketing extinguishers on a national scale *“and even generating business overseas.”*



His brother, who is educated in chemical engineering, started the company earlier in 2000, with 4 employees, after obtaining a business licence to produce carbon dioxide fire extinguishers issued by the Bureau of Indian Standards (BIS). Six months later, Gujarat suffered a major earthquake, which ironically gave a boost to their company. Since then, the government of Gujarat has required that every building in Ahmedabad should have fire extinguishers, *“which enabled us to develop our company a lot.”* The interviewed brother continued for some time with this carbon dioxide company but eventually stopped in 2003 and joined his brother in the fire extinguisher business.

#### *Internal capabilities and innovation*

There have been many changes since the firm’s establishment. The company first produced a carbon dioxide type of extinguisher – *“it was easy to start with carbon dioxide because I had been in production for years.”* The owners then acquired other licences for ABC types, dry chemical powder and foam extinguishers, all

using chemical inputs manufactured by Indian companies. The company has a product catalogue showing the full range of their fire extinguishers.

The owners gradually installed new machines and production facilities – “*we saved and reinvested step by step*” and eventually paid off their debts. They did not hire external experts to help in manufacturing, opting instead for ‘learning-by-doing’ – “*initially it was just ourselves doing this and slowly people joined us.*”

At first, they outsourced several components to third party manufacturers, such as the extinguisher cylinder and the red powder coating. However, there were delivery times and quality problems, resulting in less control of the production process, which made the owners invest in in-house cylinder production and coating processes. Fire extinguishers require a cartridge filled with nitrogen gas. The company also has in-house production for the cartridge – “*we do everything in-house, to maintain quality. We also have QC (Quality Control) people and they check the products one by one.*” Another component they plan to produce by themselves in the near future is the foam and powder. They have enough space available at their premises for additional activities. The smaller high-tech components of the extinguisher such as rubber tubes, valves, wheels and pipes are purchased from Germany and China.

The production process starts with steel plates, purchased from large steel producers in India, which are cut, bent and welded into cylinders. Three years ago, the company also introduced the stainless steel bodies, which are useful for coastal locations where salt air corrosion is a concern. The cylinder is powder coated in red and kept in the oven for 1 hour and 45 minutes at 200 degrees. Each extinguisher is also printed with the company brand logo and a serial number, to retrace the production process in case of problems. Each cylinder is tested for leakages with a hydro testing machine.



Over the years, as the business developed, the owners opened sales offices in various cities. The brother established a sales office in Mumbai to scale up the business because “*Mumbai is the India hub for business.*” The staff in Mumbai handle the export and domestic market – “*most growing companies these days have corporate offices in Mumbai*” but they will not move the production facility to Mumbai because of the high costs of land and other expenses.

The company have managed to position their product as a well-known brand in India – “*branding is very important and we devote a lot of effort to it.*” The extinguishers have a catchy logo and name printed on them. In buildings in Ahmedabad, it is easy to identify the company’s product because “*90% of buildings in Ahmedabad have our fire extinguishers.*” In 2016, the company became the 2<sup>nd</sup> largest producer of extinguishers in India, according to the owners. The business will grow according to demand. They are not planning to open another factory, since transport costs are relatively low, so there is no cost pressure in transporting goods to anywhere in India.

Most of the staff on the factory floor have a chemical and mechanical engineering background. Staff turnover is low – “*more than 70% of our staff have been working with us for 7 to 8 years. 20 people have been working for 15 years and 3 to 4 since the establishment of the company.*” The owners try to motivate and involve all the workers by setting an example – “*if I am lazy, automatically my workers will be lazy.*” Ethical behaviour is also closely observed, which means not cheating clients.

The owners see the importance of taking good care of the employees. They have a strict salary payment system and pay salaries on the 1<sup>st</sup> day of the month. The company follows the Indian Workmen Compensation Act. If any incident happens within or outside the factory, or if the marketing team is on the road, it will be covered by the company's insurance. The company also has a pension plan through the Indian Life Insurance Corporation (LIC). The company has a bonus system according to salary level – *“Indian companies usually pay a bonus at Diwali or New Year.”*

The owners cite Tata Steel as a good example in terms of ethics and core values. The company procures cold rolled coil (CRC) steel sheet from Tata. Every year, Tata insists that their safety team visit the factory and meet the workers who use these CRC sheets to give them guidelines on safety and how to use the material. Tata is thus concerned not only for the safety of their own employees, but also for that of their customers' employees who are using the material.

According to the owners, the key to success is *“15 to 16 hours' work per day.”* Over the years, the owners have also been listening attentively to client feedback and immediately took action where an improvement could be made – *“we both did a lot of hard work, perfecting things, spending time with the client, listening to the feedback of the client. Our success is also based on luck.”*

#### *External business and institutional environment*

The outlook for the domestic market is still promising – *“fire extinguishers are essential for all homes and office buildings.”* More and more housing project contractors buy extinguishers. There are competitors in Ahmedabad and Delhi but *“branding-wise, there is no problem.”* The competitors are small with modest facilities to produce and maintain only a certain minimum quality, according to the owners.

Four years ago, the company started to export to Sri Lanka and Nepal. The company got the contacts via international exhibitions, visits and the website. Not long ago an interested buyer from the USA visited them – *“international buyers check the personality and character of the manufacturers.”* The owners say it is common with Indian exporters that the first deliveries are managed well, but then standards slip – *“we don't do that, we have our ethical codes.”* The owners have ambitious plans to expand production and export abroad – *“we have this dream of having our fire extinguishers hanging in the Statue of Liberty in the US.”*



In the near future, the company plans to apply for a UL-certification<sup>5</sup> to enable them to take *“a step overseas.”* The owners expect to sell without much trouble to the US, Australia and UAE. The UL certification/approval process takes about 1 year.

The business environment in India is not easy – *“you have to build and maintain relationships and then you get everything.”* During the start-up period, the owners had to travel regularly to Ahmedabad, Baroda,

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<sup>5</sup> UL is an American safety consulting company, which provides the safety-related certification necessary for import to US.

Chennai and many other cities – *“we kept on travelling, kept on meeting people, giving presentations and providing samples.”* If client relationships and product quality are maintained properly, then no issues arise.

The owners are not hindered by government rules and regulations. Getting local permissions for construction and development has been completed without problems, and the electric power supply has improved considerably. There is confidence in how the country and state is governed – *“with Narendra Modi, there is no problem. In Gujarat, there was never a big problem with the government.”*

### 3.6 Textile and garments – blue jeans (80 employees)

The company produces blue jeans for the domestic market. It has a production factory in the north east of Ahmedabad and an office in the city centre. The 40 year old owner and director started the company 3 years ago with 20 employees (the interview is held with the owner). The production unit currently employs 75 workers – *“all the employees are skilled workers.”* Five more employees are working in the office: one accountant and four marketing and sales staff.

There is *“tough competition”* in the industry. There are at least 100 manufacturers in Ahmedabad with similarly sized businesses and many smaller ones. The owner decided to do something different by launching his own brand – *“I am not doing what everybody else is doing.”* The idea of his brand is to adapt existing designs of large international jeans brands to the preferences of the Indian consumers. The main idea is to produce similar products to the big brands for half the price.

Previously, the owner worked in the textile industry, in charge of quality control. Since launching his own business, he has spent a lot of time exploring and learning styling and design – *“I worked hard for the past three years.”* He read many fashion magazines, visited showrooms and checked websites of important brands such as Jack & Jones and Wranglers – *“if it is good in the international market, I ask myself whether the Indian market would accept it.”* He found out that it was equally important to know what style is fashionable in India – *“I had to do research on that on an on-going basis.”* He had to make some changes in fabric quality, wash designs, colours and design and adapt them to suit the Indian market. He is not exactly copying: as he puts it, *“my brand design is basically from the big buyers but I add my own touch.”*

That is how he got the idea to produce jeans – *“I realised that this is my destiny.”* Today the owner keeps following the designs of the global jeans producers – *“everybody has a godfather. Everybody follows somebody.”* The company takes ideas and follows their steps – *“making products which are 50% more cost effective – I don’t have R&D expenses.”* The owner believes that there is no innovation in fashion in India – *“we are making some changes in fashion. We are not actually innovating.”*

The owner purchases fabrics locally as there are many fabric sellers in India. The workshop is organised according to three stages of the production process: cutting, stitching and finishing. For every step in the production process, there is a team in the factory.

The cutting of the fabrics is done manually with a template according to the particular design – *“we don’t have any automated cutting.”* Then the front and back of the jeans are stitched and further assembled with pockets. There is a specialised machine for the pockets but the owner prefers use manual processes too – *“it provides employment to some women and trainees.”* There are special machines for specific parts related to finishing the jeans such as the belt hooks, zipper, brand and size labels and other small details.



The owner plans to buy an automatic laser cutting machine in the future. For the time being, he only invests in the machines required for the necessarily complicated stitching to distinguish his brand – *“I need 16 types of stitches for my brand.”* With regard to future investments, he compares his business to an aeroplane that is taking-off – *“first I need all the resources to fuel the aeroplane to get higher.”*



The owner does not do the colouring (stone washing) and dyeing, which is outsourced to a factory nearby.

When the owner started his business, he outsourced more of the production processes, *“but I was not satisfied with the outsourcing. It is difficult to assure quality while outsourcing.”* The owner sees that in-house production assures quality control – *“this is my company. This is my brand. So I am going to do whatever is required to improve quality.”*

The owner is proud that he created his business himself, which comes with advantages – *“if you are set free into the jungle then you create your own rules.”* He did not accept any support from his father, but got a private financier in the beginning, which leaves him independent – *“I don’t follow any rules and there is no boss around.”*

The owner does not sell directly to wholesalers or retailers. Sales are handled by agents for large buyers throughout India. Although small retail buyers comprise more than 60% of the total, the large buyers are *“the spinal cord”* of his business. Usually, the owner designs several samples of jeans according to his own design, which he shows to his agents. If the agents like the sample, then the owner produces the jeans in bulk, *“but we do not make goods to order.”*



The owner sees a great advantage in selling via the agents for the 3% margin they claim. The agents bring the buyers to his office where the products are on display.

The agent also brings a payment guarantee – *“selling directly to retailers carries a very big risk factor.”* The owner would like to have his own chain of retail shops, *“but it would be an immature decision. I have to improve my brand and my products. Then I will open shops.”* The owner is planning to export but he is not ready yet in terms of production capacity, quality ranges and working capital – *“I will pick the fruit when it is right.”*

#### *Internal capabilities*

The owner holds a BSc degree in chemistry. He decided to go into the textile business because he did not see a future in his field of study. His father used to be in the fabric retail business. The owner picked up

knowledge and experience within his family – *“we used to go to my father’s shop after school.”* At present, the owner works 6 days a week. He has a wife, two daughters and a son. His wife manages the household. There are no other family members living with them.

The owner is well informed about the latest fashions. His feeling for fashion comes from experience, which he picked up by going out with *“fashionable friends.”* He developed and maintains a long-term vision for his brand. He considers himself good at prioritising – *“I know what is essential and what is not in growing my brand.”*

Regarding organisation and management, the owner oversees all the production, sales, management and administrative issues. He has trained a floor manager to look after the factory while he is in the office in the city centre. Running a jeans factory brings a lot of daily management and personnel issues. Staff come and go – *“people do quit.”* The problem is to find a replacement and *“train the person according to my quality standards.”* He explains that the new staff have to adopt his brand and quality standards, *“which are different from other producers in the current market.”*

His workers are from Uttar Pradesh, Bihar, Orissa and Rajasthan because there are few skilled workers in Ahmedabad – *“I cannot find skilled workers for the quality I want.”* They arrange their own accommodation and take breaks of a few weeks to go back to their village. The manager is from the Marwari community, but that does not play a role in how he recruits staff or works with people. It is quality and skills that count. *“If a business owner only deals with people from his own community or caste, then he will not progress.”*

The workers produce on a piece basis – *“all the textile industries in Ahmedabad run on a piece basis these days. There is no fixed salary.”* The owner does not like the fixed salary system *“because people will not work accordingly. If you don’t make anything, you will get nothing.”*



There is no additional holiday for the employees, according to the owner, since in India, there are so many festivals – *“you can celebrate 165 days a year.”*

The skilled workers do not have any formal degrees – *“they are all illiterate.”* Some bring their younger relatives as trainees. The skilled workers learn by joining their parents – *“the children are in the factory with their parents or uncles for training. It is not child labour: they are not being paid.”*

Production is organised in such a way that he can track which piece is made by which worker. This ‘tracking’ is different from other textile producers. If there is damage or any quality concern, he knows who made the mistake *“and he or she will be penalised for that.”*

#### *External business and institutional context*

The owner is positive about the business environment in India – *“I have so much demand for my product.”* In his view, the key to success is the assurance of product quality and being an honest businessman.

The owner believes that the formal policies and regulations for SMEs are fair in India and taxes are not too high. He recognises that there are people who complain – *“they don’t want to pay taxes. They want to bring their product to the market and fill their pockets.”* The owner sees that informal and *“black market”* work does not bring benefits in the long run.

When he started his business, he could not take out a bank loan because he did not have a business track record. Since he is doing everything in a proper way, like paying taxes, he is building a CIBIL<sup>6</sup> credit score – *“I am an honest businessman, I am paying taxes so I can show my records and my growth.”* The owner engages a chartered accountant who advises him in getting benefits from the government – *“they guide me and I work accordingly.”*

The owner now receives government support in the form of a subsidy for a loan to purchase some machinery. Initially, he applied for a bank loan at a rate of 11% per year, *“which is too high.”* He applied to the state government with the argument that he is a manufacturer bringing money into Gujarat. He now gets a 6% government subsidy, so the bank loan is currently 5% per year. There is a condition that he first has to prove his business growth. Then, after two years, the state will disburse the subsidy.

The owner sees that there is corruption in India, mostly relating to the informal economy – *“if you are doing business and earning in the black market, then you have to pay something to somebody.”* In his view, corruption would be less if the taxation system were simpler and clearer; civil servants would not be able to take advantage of the confusion and get money under the table – *“that is why they are not willing to make the taxation a simpler process. There is some objection because everybody’s pocket is getting filled by the complicated types of taxation processes.”* The owner would like to see improvements and coordination in tax regulations and paperwork applied across India – *“there are 14 states and 14 different tax procedures and regulations.”*

The owner does not work within the informal cash economy. He notes that the result of demonetisation in India was that *“many factories in Ahmedabad that were doing business on the black market shut down.”* Demonetisation has also affected him as regards paying salaries. His labourers have bank accounts but they do not want to receive bank cheques, preferring cash. The problem is that Indian banks under the demonetisation regime can only hand out small amounts of cash – *“I have 10 lac rupees in my account but I can’t withdraw more than 20,000 rupees per week. I lack cash flow.”*

Another issue with bank accounts is that if the owner provides the workers with cheques, the entire amount goes to the bank account and the family back home comes to know about it. The labourer wants to keep something in their pocket for their own use, without showing the family at home – *“in some cases, they can do things which the family does not allow, like drinking liquor and other things we can’t discuss.”*

There are labour unions in India. The owner has an official licence to establish the factory and maintains a relationship with the labour union. Employees can go to the labour court if there is a problem with the hygienic or sanitary conditions, shelter, ventilation and lighting – *“if the lighting is not enough, it affects their eyes.”* The owner installed a single light no higher than eight feet above every machine *“so their eyesight is not damaged.”*

### 3.7 Pollution – micro-algae water treatment plants (14 employees)

The company produces micro-algae based waste water treatment systems for textile, dye, leather and other polluting chemical industries. The company has an office in Ahmedabad and a laboratory in Chennai – *“we*

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<sup>6</sup> TransUnion CIBIL Limited (Formerly: Credit Information Bureau (India) Limited) is India’s first Credit Information Company (CIC), founded in August 2000. TransUnion CIBIL collects and maintains records of an individual’s payments pertaining to loans and credit cards.

*have around 14 people at the moment, but that is bound to increase significantly now.*” There are 6 staff in management and sales and 8 technical staff.

The owner started the company in an informal way 3 and half years ago. It was officially registered a year ago. This year the projects have become successful. The company has large and small clients, with one large client accounting for 70% of the revenue so far. The revenue for this year will be 1.9 crore rupees (300,000 USD).

The interview is held with the owner, who is a qualified biochemical engineer (IIT Kharagpur). He was previously working with a US-owned company manufacturing artificial coal based in Punjab. Biomass from agriculture was collected and processed into artificial coal –*“the waste water to be discharged contained a significant amount of contaminants, which was difficult to treat in the existing treatment systems in the market.”* All of the technology either failed or involved high operational costs, but *“then we met a micro biology professor from Chennai [University of Madras], who provided a solution for us.”*



#### *Internal capabilities and innovation*

Conventional processes in waste water treatment typically use bacteria for degradation of organic contaminants. However, in the case of extremely toxic molecules, these bacteria do not survive. The professor found that micro-algae are able to survive while reducing the harmful contaminants. This is the only technology that emits oxygen and absorbs the carbon dioxide, instead of emitting carbons, because this is a green organism involving photosynthesis. The micro-algae grow and the residue is green biomass, which can be composted for sale to fish farmers and as an agricultural food supplement –*“this is the kind of additional benefit that we can give to the client.”* Sustainability does not come with an extra cost but with extra income.

The professor also discovered that a magnetic field can modify the intake of micro-algae. With changing intensity and frequency of the magnetic fields *“you can control and change the intake behaviour of the microorganism.”* He does not understand exactly how that happens but *“it changes certain receptor pathways in the cell walls.”* With the technology, it is possible to *“programme”* the algae the terms of their uptake. According to the owner, this is the only company in South Asia, *“as far as I know”* that is working in this particular technology.

The professor did not have a business model at that time. The owner *“was very much impressed by the insights he gave us.”* The professor did not have a team to implement the idea on a larger scale. The owner suggested working with the professor to formulate a proper business model around the technology and start a company to commercialise the invention –*“it was an informal collaboration first and then we slowly structured it and this is where we are right now. The professor was very apprehensive at first.”* The owner convinced him about the further engineering and marketing that he would provide. The owner also had an *“angel investor.”*





The professor became an equity holder and the principal scientist in a company. The owner got exclusivity to be able to scale up the product idea in India. The company has 4 key staff involved in engineering, marketing and sales, commissioning of plants and R&D, respectively.

The company secured its first client, a manufacturer of acrylic fibre importing gel dye from Germany which included a significant amount of toxicity. No bacteria was able to clean the waste product and survive and no one in India was able to provide a solution. *“It took us almost 1.5 years to complete that project and it was successful.”*

Now, a year later, the company provides total ‘turn-key’ effluent management systems. The company produces algae in a laboratory housed in the Institute of Magneto Biology in Ahmedabad. The institute conducts interdisciplinary research into magnetic fields. The total systems include some conventional subsystems involving mechanical equipment, which the company outsources – *“there are many manufacturers and traders of such equipment and water tanks.”* Some clients invest in the hardware themselves and the company supplies the *“software,”* the micro-algae.



The company’s technicians go first to a client site to understand the situation and needs – *“then we develop and design end-to-end systems to cater to that.”* The company then conducts a small trial at the client site. The client sees first-hand how the system is going to work in the longer run.

The company is ideally located because nearby in Rajasthan, Gujarat and Maharashtra there is a significant amount of polluting manufacturing activity within the textile, chemical and electro plating industries.

#### *External business and institutional environment*

Industrial pollution is a major problem in India and so the market potentially offers many opportunities. The owner is not afraid that employees will leave the company and start businesses themselves because the waste water treatment market in India is huge. The owner sees that awareness within small and medium-sized companies about waste water treatment is very low in India at present – *“people are slowly waking up.”*

The owner shares stories about dye manufacturing companies who secretly discharge heavy polluted water. *“Owners of dye companies position watchmen in the night to check whether any regulatory body is coming and checking. If not they just discharge the extremely toxic effluent.”* Many companies run on *“thin margins”* and cannot afford expensive existing technologies. There are many owners with good intentions looking for credible and cheap waste water treatment alternatives, according to the owner. They are willing to invest in technology if it is commercially viable. For instance, 200 km from Ahmedabad there is an industrial park near Baroda. *“If you take out the ground water at any place, it will be dark brownish, completely dark brownish.”* The company sees an opportunity in those worst contaminated sites – *“we provide technology to them and we provide solutions to them.”*

Recently the company started a collaboration with international partners. Welsh Water in the UK has set up a number of water and sewage treatment plants in Wales. They have invited the company to install a small demonstration project – *“but the accreditation that they require to work there is very stringent.”* The

company also has a research cooperation with Swansea University in the UK – *“we are working with them in the field of bio fuel production and an algae based carbon dioxide mitigation system for the Tata Steel plant in the UK.”*

The company does not have a patent because the patent protection structure in India is not very strong. The owner avoids patenting since the application procedure is too bureaucratic and not much advantage is expected at the end of the day. One key issue is that details of his technology will be published in the public domain. He expects that it will only take a year for someone to figure it out and bring systems to the market. If he files a legal case against someone who copies him, it would take 10 years to get any concrete results – *“we do not file and believe in patents. We have got technologies which are our own.”*

The manager does not like to be referred to as a start-up. If he wants, *“the company could easily get featured in newspapers tomorrow”* but he avoids media exposure. *“Manufacturing industries, as our target clients in the country, have a mental block about engaging with people and technologies that are new.”* Potential customers do not want to enter a business contract with start-ups.

Innovation is not popular in manufacturing companies, according to the owner. The sector is still being run by older and traditional people and families who have been in the same position for years now and do not innovate or think ‘outside the box’.

The owner is cautious and somewhat disappointed with the government. With the sustainable technology they have developed – *“you would expect authorities to lower the glass ceiling for us.”* Formal institutions have not helped them so far – *“the pollution control board has been the biggest problem for us.”* They do not want to encourage new technology because *“the environment will benefit but they lose their money gained from corruption.”*

### 3.8 Food processing – Indian traditional confectionery (200 employees)

The company produces and packages traditional Indian confectionery and sweets such as sohan papdi, rasogolla, chikkis (Indian nougat), shahi gulab jamun and soan cake. The company is located in the Bhavnagar district of Gujarat. The company was set up in 2012 by an ambitious young Indian from Bhavnagar who is the present owner and director (the interview is held with him).

The company has developed rapidly since it was established. The owner started the business with just 7 employees. *“At the very beginning, the son papdi production was just 4 kg of volume per day. In the morning, we used to manufacture and in the afternoon go out selling.”* In five years, the business grew from 7 to 200 employees and is one of the fastest growing businesses in Bhavnagar.



The company also owns three shops as ‘exclusive factory outlets’ in Gujarat. The company plans to expand the number of exclusive factory outlets to 20 in the coming months. It also sells via a distribution network of 10,000 small retailers, provision stores, groceries, supermarkets and malls. The company did not take out loans initially. By saving money from sales, the owner invested incrementally in machinery, equipment and buildings. Today, the company has a turnover of 35 crores rupees per year (5.4 million USD).

The company has its origins in a family-owned business of milk products. His grandfather started in 1912 in Bhavnagar, “*but we had a family issue and a dispute. We were separated.*” The owner sees a typical pattern in Indian family businesses, which do not survive for long – “*ultimately the businesses will fall apart. It lasts for two generations and then it declines.*” Therefore the owner has explicitly set up his company, not as a family business – “*I want a sustainable long-term business. It should run for generations.*” He does not expect that the next family generation will take over, “*but someone based on merit.*”



### *Internal capabilities and innovation*

The young owner and director is educated in food technology. When he was in high school, he already had the idea to start a food industry business. During his studies, the university awarded him several gold medals and he wrote articles about processed food. “*I got offers for several scholarships from the US and from UL [Université Laval] in Canada, but I never wanted to study masters.*” He gained working experience with the Indian dairy company Amul. He also worked for Cadbury and Nestlé, where he was exposed to international food technology practices. With the combination of education and professional experience, he was confident to start his own business five years ago. He also learned a lot of marketing from previous international employers. Apparently, Nestlé spends 6% of their total turnover on advertising – “*they are masters in it.*”

Before starting the business, the owner developed a concept based on an idea to promote Indian confectionery. He believes that Indian confectionery is one of the finest in the world, but the problem is that it is hand-made and sold openly in the streets – “*you can buy it in many places but it is unhygienic and the quality very variable.*” Indian confectionery is seldom produced on an industrial basis involving food technology practices. “*The reason that no one is manufacturing it is a lack of focus. Everyone wants a quick profit.*” He did some market research which confirmed his intuition that Indian confectionery is a huge market of which only 2% is organised and 98% is unorganised and informal. The owner found a niche: producing traditional Indian confectionery in a hygienic way in convenient and ready-to-eat small packages.

The owner compares his concept with cheese production – “*at one time it was an art, but now it has been converted into a food technology and science.*” He feels that Indian confectionery is an art and his purpose is to convert it into science. The key is to offer consistency, convenience and quality to customers at a competitive price. A challenge in Indian confectionery is the shelf-life. Many products contain fresh milk, with a 4 day shelf-life only – “*if Americans and other Western countries can make cheese from milk with a nine month shelf-life, why can't we make khoya with a similar shelf-life?*”



The owner took a technical rather than a management approach in starting and developing the business. His technical expertise helped him to develop the technical aspects of the company. He did not seek external advice, but searched the internet and read up on food production history. For example, he found that son papdi is also made in Turkey, but it is manufactured automatically, which prompted him to buy a machine from there. The owner standardised the other confectionery production processes and introduced existing food technology from elsewhere. “*In 4 years of practice, we have used all types of sales and marketing*

*techniques, standardising each and every product, giving consistency to the customers.*” His products are packaged in small bags, cans and cups, *“so it is easy to use and eat and clean.”*

The organisational structure of the company has several management layers: shift supervisor, floor managers, production manager and general manager. Most of them are food technologists – *“it is the minimum requirement.”* The owner started to hire good people from industry. He believes in professionals and is prepared to pay the price.

The owner is very much aware of the importance of being in contact with customers and knows the management techniques required to influence their behaviour. The marketing of packaged food requires a change in the mind set of customers. The owner found out that consumers prefer loose sweets above packaged sweets – *“the perception is that loose sweets are fresh.”* The owner set up teams in the outlets to explain the freshness of the confectionery in packages. Gradually the customers started to understand the freshness while being more hygienic and nutritious. *“We are now looking for the means to set up a mass communication campaign to encourage people to buy packaged sweets instead of loose sweets.”* The owner expects and already observes a shift towards packaged and fast food in India. *“There has been a huge change in demographic food patterns, especially in India and the Western region.”* Conveniently packaged food is the future, along with the development of the country. There will be no loose selling of milk, for instance, only processed and packaged.

The sales dimension of the company is very important. The sales team consists of 50 staff – *“we have a national sales manager with 20 years of experience.”* He is a strong believer in Japanese management and a big fan of Toyota. He learned about lean management and just-in-time production and focuses on where he can cut costs, removing non-value additional items in the production process. In this way, the company can produce with fewer labourers. They removed non value adding items in the packaging. The focus on reducing labour and packaging costs meant productivity could be increased – *“the initial production cost of son papdi was 15 rupees per kg. Now we have come down to 5 rupees and this year we are aiming for 3.5.”* The Kaizen management software is used. Housekeeping, fire security, and other safety guidance are followed properly – *“I am a deep believer in that. If we implement it, then no one will be able to beat us.”*

The factory workers come in teams from Rajasthan and Uttar Pradesh. *“We ensure that there is no reliability on any one team, and we don’t want to monopolise it. So we have multiple teams.”* The owner faces some problems in that Indian employees and labourers are less efficient than Japanese workers, for instance. The owner says that he pays well because he wants his employees to work hard and observe professional conduct – *“if normal wages are at 200 rupees, then we pay 250 rupees. That is our company policy.”*

#### *External business and institutional environment*

In its 4 years of operation, the company has succeeded in setting up their distribution channels and selling to the Western region of India. *“Now we are working to enlarge our distribution network to Southern India. We found such a huge Indian market.”* There is one Indian competing confectionery company, which is a family business. The owner says his firm outperforms them in service and marketing – *“this is very much a service based business.”*

The company is not yet exporting. The owner expects in 2 years’ time to export to the US and Australia because there are a lot of Indians living in these countries. The competition will not be the problem, according to the owner, but *“to comply with the international quality and hygienic standards that will be the bottleneck for many other Indian competitors.”* The owner already applies international quality practices and norms to whatever is produced in his factory. The company follows the transparency practices approved by the Indian



Food Safety Standard Agency (FSSAI). For instance, the packages should list contents and manufacturing and expiry date.

The owner contacts companies overseas for input and technology so he can deliver the highest quality. He currently is in negotiation with an American company to produce convenient plastic cups for the products. Other types of cups are currently sourced from China. They have a machine from Japan, to produce Kachori. The owner had to adapt it for Indian products, *“so there are technical skills required.”*

He established relationships with food processing technologists in universities overseas. Two years after setting up the business, he went to Dubai and Dusseldorf. He came across several food processing technologies. He also observes that the costs of investment in today’s advanced technology continue to increase exponentially. This gap is wide and firms have to compensate with mass production.



The owner is happy to be in Bhavnagar. The overheads are low, making manufacturing cheaper than in Ahmedabad – *“if you bought this space in Ahmedabad, it would be 6 crores, I bought it for 1 crore.”* The market is in Ahmedabad – *“it is like producing in 3rd world countries and selling in a developed country.”*

The business environment, including government regulations and infrastructure, is *“typical”* for India. He believes that bribery within government offices is hampering economic development. When he bought the land, he had to put in a lot of extra effort to change the agricultural land into a non-agricultural site, which involved 22 departments for audits and clearing – *“if corruption can be stopped in India, then we would advance quickly.”* He believes that Prime Minister Modi is doing the right thing – *“as a young entrepreneur, I am optimistic.”* The owner is positive about the Gujarat government – *“they are supporting us.”*

There is a lot of schemes and subsidies and benefits provided by the government, which is a positive development. However, there is a problem with bureaucracy. There is government support for start-ups but no clarity. To get into the system requires at least three years and much more follow up – *“I could have developed another line of business with this time investment - so why spend time on that?”* In particular, it requires a lot of time to establish a relationship with a government officer and understand their *“mathematical calculations and equations.”* The owner would advise that government consider the challenges from the point of view of the firms and *“just help us to improve.”*

## 4. Analysis and conclusions

The aim of the qualitative study on innovation in manufacturing SMEs in India is to complement the quantitative research part of EIP-LIC, as well as provide grounded insights to help similar research projects at other academic institutions. This could help researchers to validate, compare and complement existing theory in literature and research design and hypothesis development with contemporary realities on the ground in India, as perceived by manufacturing SME owners and managers. Earlier qualitative studies in the framework of EIP-LIC have been carried out in Kenya, Ghana, Tanzania, South Africa, Indonesia and Vietnam, applying the same qualitative approach and report format, and enabling comparison across the countries of study in the DFID project.

The growing collection of insights of the various countries shows how innovation processes and mechanisms are manifested within manufacturing SMEs in emerging economies, and reviews the internal capabilities and external environment, including formal institutions, the business system and the informal institutional context. The research framework is reflected in the list of semi-structured interviews (see Annex 1). In addition, the owners and managers shared their stories outside this framework and advanced issues that are relevant and interesting for current scientific work.<sup>7</sup>

It is important to note for the analysis and conclusions below that the validity of qualitative research should not be considered in terms of sample size and representativeness of the cases for the total manufacturing SME sector in India. Qualitative research, in general, does not claim to collect and analyse data from a representative sample. Instead, on a case-by-case basis, the qualitative analysis provides exploratory (deductive) insights into issues, processes and systems in a bottom-up way that helps to suggest theoretical concepts for the local context. It may suggest original or overlooked and policy-relevant factors (variables) and conditions to follow up in the quantitative analysis. Against this background, the selection of cases involved ‘information-oriented’ sampling, as opposed to ad-random sampling, aiming at developing a diverse yet comparable dataset with regard to subsector, enterprise size and innovative activities.

In the paragraphs below, several key trends and notable patterns across the Indian SME cases are analysed. It is important to note that this concerns a first analysis of the qualitative empirical material from India within the DFID project context, which is to be followed up in more depth with a view to developing or complementing academic articles. The chapter concludes with initial policy ideas and implications and several observations with regard to the set of future research considerations within or beyond EIP-LIC.

### *General observations*

A first overall observation during the preparation of the fieldwork in India, compared to organising the qualitative interviewing in African countries, was the relatively high number of formally registered SMEs (10-100 employees) in the manufacturing sector in Ahmedabad and around. Moreover, SME owners and managers were open to receiving the research team at their premises for an interview. The interviewed SMEs, in terms of employees, were larger in size than most of those interviewed in the African countries so far. Another large segment was informal household based enterprises, which were not included in this research. This represents the so-called ‘missing middle’ of SMEs<sup>8</sup>. There are relatively few enterprises of 10-40 employees.

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<sup>7</sup> The qualitative studies of all 10 Asian and African countries of study will be available for researchers and a wider audience downloadable from the project website: [www.tilburguniversity.edu/dfid-innovation-and-growth/](http://www.tilburguniversity.edu/dfid-innovation-and-growth/)

<sup>8</sup> This phrase has been used relatively loosely in economic development discussions, meaning a lack of SMEs particularly in the developing world. See: <http://www.africa.com/blog/investing-in-africa-defining-the-missing-middle/>

### *Innovation definition*

Most interviewed owners and managers in the Indian companies described in chapter 3, in different ways, introduced new products, processes and technology in order to improve and expand their business operations. Some would clearly qualify as innovation, while others would not, depending on how innovation is defined and assessed. In advanced economies, innovation is typically measured by R&D expenditures and number of patents of new products or processes as proposed amongst others in the Oslo Manual<sup>9</sup> (OECD, 2005). From a radical technology perspective, many of the ‘newness’ introduced in the Indian cases would not qualify as innovation. Such an assessment would, in any case, have been impossible because the owners do not systematically record R&D expenditures and have not registered patents.

Taking a broader and economic perspective on innovation, viewing it in terms of incremental adoption and adaptation or of new combinations of existing technologies creating value (Szirmai et al., 2011), it is evident that the new elements introduced in the interviewed companies resulted in improved and expanded business operations. As described in emerging innovation theories on LICs, much innovation depends “*on an aggregation of small insights and advances through ‘learning by doing’ rather than on major technological inventions*” (Carayannis et al., 2003).

Despite increasing interest in the literature, the exact definition of innovation in LICs remains an issue in theory (Çapoğlu, 2009) and for its application by the researchers in EIP-LIC. The broadest possible definition of innovation, from an economic perspective, referred to in the qualitative research section, is everything new that the company does to raise productivity and/or to stay ahead of its competitors. Or as Fagerberg et al. (2010) put it: “*Innovation is often seen as carried out by highly educated labour in R&D intensive companies with strong ties to leading centers of excellence in the scientific world. Seen from this angle innovation is a typical “first world” activity. There is, however, another way to look at innovation that goes significantly beyond this high-tech picture. In this, broader perspective, innovation – the attempt to try out new or improved products, processes or ways to do things – is an aspect of most if not all economic activities. In this sense, innovation may be as relevant in the developing part of the world as elsewhere.*”

Assuming the broader perspective on innovation in EIP-LIC, in box 1 several definition elements are proposed to assess innovation in an LIC context for the analysis of the cases in this report.

#### **Box 1: Innovation newness, process and value creation**

A cross analysis of definitions in innovation theory from recent decades (Voeten et al., 2011) shows that innovation is repeatedly typified by three key elements: newness, process and value creation.

Addressing the first element, Kotabe and Swan (1995) argue that innovation can be investigated in terms of both **newnesses** to the company and newness to the market or world.

Regarding the second element, the innovation **process**, all owners and managers themselves initiated, managed and owned the innovation process within the unit of analysis, their company. They developed the idea, sometimes inspired by others, started to run small experiments and trials and eventually implemented the new product or production technique on a commercial scale. As is often the case in incremental innovation in developing countries, this was not a planned and formalised process involving a pre-defined innovation strategy and an R&D department.

The third element, **value creation** of innovation, is evidenced either through lower input costs or higher sales revenues (Porter, 1985). Higher profit through new premium products of better quality, or appealing to a certain fashion, increases competitiveness.

<sup>9</sup> <https://www.oecd.org/sti/inno/2367580.pdf>

Regarding the dimensions of innovation, Kaplinsky and Morris (2001) identify five types of innovation: (i) process innovation, aiming at improving the efficiency of transforming inputs into outputs; (ii) product innovation, leading to better quality, lower price and/or more differentiated products; (iii) business practice innovation, implying new ways to organise the business and attract new clients; (iv) functional innovations, assuming responsibility for new activities in the value chain, such as design, marketing and logistics; and (v) inter-chain innovations, moving to new and profitable chains. These types of innovation are taken into account in the analysis in this report.

In many innovation definitions and measurement documents, such as the OECD Oslo Manual (OECD, 2005), a distinction between product, process and other types of innovation is made. However, explicitly distinguishing the types of innovation in the manufacturing SME cases interviewed so far in the EIP-LIC countries of the study was not such a clear and simple matter. It is more common to see an integrated combination of several types of innovation, where one type of innovation triggers or enables another, such as the introduction of a new process (technology) that results in the launch of new products requiring the reorganisation of the workshop and staffing. Analysing the Indian cases for newness, process and value creation, as suggested in box 1, is one possible way to assess whether the observed new phenomena within the companies qualify as innovation or not.

1. The bearing casting company did not innovate in terms of new products or process technology. Instead, the owner introduced a new human resources management practice by involving staff more and sharing responsibility and ‘ownership’ in improving the production processes. This could be qualified as a management innovation which resulted in increased productivity. Kaplinsky and Morris (2001) classify this type of innovation as business practice innovation.
2. The dyestuff company has introduced an environmentally friendly product, the salt free dye, and improved the production processes by joining the water treatment initiative in the cluster. This would qualify as product and process innovation, which reduces the risk of getting fined or closed for failing to comply with environmental protection policies, thus de facto assures business survival and growth in the long run. The water treatment initiative creates ‘environmental’ value as well, referred to by some researchers as ‘responsible innovation’ (Van den Hoven et al., 2014). The innovative activities in terms of new technology and new products developed within the company are limited at present. The company uses the standard technology available in the market.
3. The young female entrepreneur has the smallest company of the cases in chapter 3. The introduction of the cake mix is not new-to-the-world, but it is new in the local market. She experimented herself and discovered the optimal formula and baking process. This could be qualified as product innovation. She is also marketing the product following the ‘Tupperware’ approach, which is relatively new in the Gujarat. This practice could be labelled as marketing innovation.
4. The owner of the tile company in the ceramics cluster previously ran a company producing small wall tiles with outdated technology. He started a new company involving state-of-the-art technology (process innovation) and started to produce large floor tiles (product innovation). At present, the owner is developing new designs, but the ideas and input materials for these are supplied by international buyers. The initiative and ‘ownership’ of the innovation process, therefore, does not lie with the company.
5. Instead of only filling empty fire extinguisher cylinders with carbon dioxide, the owners set up an extinguisher manufacturing factory themselves. Within the company, this could be qualified as product innovation, but also functional innovation because the company included an additional step of the value chain in their operations. In fact, since the company’s establishment, the owners have aimed to produce input materials by themselves, to assure quality and timely delivery. Instead of outsourcing the

production of a component, this company is doing things the other way around, which is functional innovation, according to Kaplinsky and Morris (2006).

6. The textile company producing blue jeans is copying existing jeans models and adapting them to the Indian market. This is an adaption of an existing product in the market, and thus a product innovation. The owner uses existing technology from abroad and has some ideas to upgrade.
7. The micro-algae producing company concerns a high-tech product and process innovation that is new to the world. The research discovered and tested that the micro-algae technology is able to clean extremely polluted water and the idea is now commercialised, with initial successes.
8. The confectionery firm introduced the production of traditional confectionery using modern food preservation and packaging technologies. This could be qualified as process innovation. The products are packaged in small quantities, which is a form of product innovation.

#### 4.1 Trends and patterns in the cases

From a macro perspective, the Global Competitiveness Report 2015-2016 of the World Economic Forum indicates that India is becoming more industrialised and competitive on the global market. Firms are becoming larger and starting to exploit economies of scale. Input factors are used more efficiently to raise the rate of return and increase product quality. Productivity increases, because wages rise with advancing development. Against this background, the set of cases explored should be read in the context of an *efficiency-driven* economy, as defined by Porter et al. (2002). The companies interviewed in Gujarat are competing less on factor endowments, unskilled labour and natural resources, as many African countries do. While firms in the latter countries are more involved in the trade (export) and processing of primary materials based on their factor endowments, India processes much of its primary material in the manufacturing sector.

The owners of all the interviewed companies seem much more aware of the importance of introducing new products and technology to raise productivity and efficiency to maintain their level of competitiveness. The interviewed SMEs introduced a mix of product and process innovations as well as management and organisation innovations. The new products and processes in the innovative companies were not radical and not new-to-the-world, with the exception of the micro-algae company, which developed the idea and discovered the technology. The ideas for new products are mainly acquired from the market and from suppliers. The common picture is of customers coming with requests and suggestions and owners talking with clients. Improved or new products requested by customers indicate demand-driven innovation.

##### *Internal capabilities*

In all cases, except for the tile producing company, it is the owner who initiates, coordinates and manages the new ideas, including preparations for the innovation, technical details and the product launch. There is also a difference in the expertise and educational background of the successful owners. On the one hand, there are owners who have a particularly technical background, in mechanical or electrical engineering for instance. They have established a company around their technical expertise and stay very close to the production process. Several of these cases show a certain top-down management practice. On the other hand, there are owners with a management or commercial educational background, who introduce management and organisational innovations and delegate responsibility and ownership to technical staff.

Another interesting observation, which differs from the Africa reality, is that most of the interviewed companies are family businesses, a common phenomenon in India. Family members help each other to set up a business, which may be critical to overcoming initial start-up problems. Businesses that belong to a family or a group of family members are usually medium-sized or larger. The confectionery case deliberately

deviates from being a family business, because the owner believes that family businesses only remain viable for 2 or 3 generations.

The workforce in the companies comprises unskilled and skilled labourers in the production workshop and well-educated staff in management and marketing. Several owners face the difficulty of a high turn-over rate of unskilled production workers, since there are plenty of employment opportunities in Gujarat for lower educated workers, as reported by several of the managers and owners. All the companies try to retain workers and have some system of rewards and bonuses. The skilled production workers seemed more loyal to the company, and the well-educated staff are the most loyal. The recruitment of workers is, therefore, an ongoing concern for the owners and managers.

The Indian education system does not deliver workers ready to do most of the production, commercial and marketing work. Graduates from colleges and universities do have theoretical knowledge but lack practical skills, so most companies have to provide additional in-house training. Nonetheless, in some cases, the employees provide innovative ideas.

Typically, the firms' technology and machinery has been in use for a long time, but is still able to deliver a certain minimum product quality. Occasionally, new machinery is bought from profits and savings.

The interviewed owners and managers are well-informed about technological possibilities though the internet or informal contacts and have ideas and plans for upgrading and expanding their companies. However, new state-of-the-art machines are too expensive and advanced relative to the expected returns on investment in the short run. The investment cost increases exponentially for advanced technology.

#### *External business environment and formal and informal institutions*

All the interviewed SME owners and managers indicate that the business environment is challenging in Gujarat and India as a whole. There are many market opportunities for domestic and export business, but also many competitors. All the business owners see the necessity to be original and innovative. Building and maintaining relationships with the business community is critical. The two cluster cases are discussed, the tile company and the dyestuff company. There is substantial spill-over of technology as a result of cooperation between firms, subcontracting or other forms of collaboration within value chains, business clusters or networks.

Most enterprise owners are positive about the formal institutional context, in particular, national policies to develop economic growth introduced by Prime Minister Narendra Modi. The financial digitalisation, demonetisation and environmental policies are all welcomed. At the operational level, many companies mention some degree of corruption in their interactions with government agencies, mostly to speed up processes for approvals, licences and so forth. Companies are not discouraged in their operational and innovative efforts.

No interviewed company received support from the government. Most owners feel that they have to survive on their own. While most of them think this is reasonable, some support in terms of credit or technical support would have been welcomed.

A bank loan for an investment in new technology is avoided in most cases. The banking system is not an attractive source of finance for SMEs. High interest rates and complex paperwork is a critical issue. Instead, most SME entrepreneurs find investment money from savings and informal loans from family members. Most take a step-by-step approach, involving minimal risk by investing incrementally before or after receiving large orders.

Branch associations are an important source of information and business contacts and contracts for the owners and managers of the interviewed firms. Most of them are members of an association, but interaction with

formal technology institutions, as suggested in the innovation systems literature (Lundvall, 1997), does not happen. Many SME owners and managers indicate that they would like to cooperate with universities to undertake research at their premises, to share research insights, for instance.

The informal context for the young female entrepreneur presents some challenges in terms of gender relations. Often, family and friends do not take her entrepreneurship seriously, considering it less valuable and meaningful than studying at university and getting a corporate or government office job. Society expects her to get married in her early twenties.

## 4.2 Policy issues – insights for policy makers to consider

As argued in the introduction to this report, it is desirable to develop innovation within manufacturing SMEs in India to enable them to contribute a larger share to the country's overall GDP. This necessity was acknowledged both in the in-depth interviews with SME owners and managers in Gujarat and in the discussions during the EIP-LIC policy stakeholder meeting, held at Ahmedabad University on 13 December 2016. The state government has for some years formulated and implemented various innovation policies. The Gujarat Industrial Policy 2015 includes support for the Nodal Institution, which supports start-ups and companies with innovative ideas. The Gujarat State Innovation Council aims to promote innovations in the state. In early 2017, the Gujarat government introduced India's first Student Start-up and Innovation Policy. The objective behind the initiative is to help make a qualitative improvement in the conventional education system and to create a conducive environment to inculcate creative thinking and a problem-solving attitude amongst students.

The reality of the interviewed cases is that SME owners do not enjoy the benefits of any innovation policy. Moreover, several other issues emerged aside from the policies already implemented by the government. Some SME owners and managers are aware of R&D centres and programmes aiming to support technology development for SMEs and develop an innovation-driven economy. However, the companies are seldom involved in the actual technology development, nor are they connected to the formal institutions.

SME owners and managers in Gujarat are well informed about state-of-the-art technology in their line of business, but they cannot afford the machines because of the increasingly high costs. Contrary to many other countries researched in EIP-LIC, where SMEs do not invest because of the uncertain future, the Indian owners seem to have trust and confidence in the current political leaders and their administration. This is witnessed by the fact that companies are not reluctant, once financial means are available, to invest significant amounts of money.

Recruiting well-educated staff is not such a problem in itself, but it is a greater challenge to make them really innovative in their working practices. Higher education is still very theoretical and most SME owners have to test and train the new staff in practical and commercial skills.

Another issue is whether the technology-focused policy approach, directing India further towards an innovation-driven economy, is the most appropriate and most effective way to develop the manufacturing SME sector. This relates to the finding that most technology required by the sector, except for IT and app development, already exists elsewhere in the world. From an economic perspective, the adoption or adaptation of technology and products is also as long as it is commercialised, creating value. Against this background, innovation policy could equally include technology adaption and adaptation as well as business practice, management and organisational innovations.

Some believe that technological innovation is critical for SME development and catch-up in LICs. Technological innovation has, however, been traditionally concentrated in developed countries, given the costs and risks involved in stimulating technological innovation. Foreign sources of technology account for



a large part of productivity growth in most countries, also witnessed in the Indian cases. Therefore, the development process in LICs could be supported by tapping existing technical and product knowledge.

Moreover, the stories and experiences of the owners and managers raise the issue of whether an innovation-driven and new-to-the-world innovation approach should be the way forward. Most of the required technology is already available, but elsewhere in the world. All the owners in the cases are well informed about the technological possibilities of their business. Without too much difficulty, they find the technology themselves by drawing on various sources of information such as the internet, informal business contacts and trade fairs. Moreover, the companies themselves refine and adapt the existing technology once acquired. So, although setting up technology development projects and programmes may help SMEs, the availability of technology is not perceived as a barrier to innovation by the owners and managers.

It seems that the notion of growth as ‘manna from heaven’ as reflected in convergence theory, see the earlier rejected exogenous growth model of Solow and Swan (Fagerberg et al. 2010), might work after all because of the free and widespread access to knowledge and technologies via the internet. The knowledge itself is available to local companies in India. Despite policy recommendations, which are in line with the findings in the cases in chapter 3 of this report, the question remains as to what extent the government will be able to reach SMEs.

### *Innovation climate*

How then can the innovative capacity of SMEs in developing countries be increased? According to the World Bank, an efficient innovation policy by governments will address the overall innovation climate, which goes beyond traditional science and technology policy. At the same time, government action can usefully focus on a few generic functions to help SMEs to grow. It can facilitate the articulation and implementation of innovative initiatives since innovators need basic technical, financial and other support.

The government can reduce obstacles to innovation in competition and in regulatory and legal frameworks. Government-sponsored research and development structures can respond to the needs and demands of surrounding communities. Finally, the education system can help form a receptive and creative population. Regarding actual innovation policy development, there has been a considerable amount of work in developing countries, such as the World Bank (2010) report ‘Innovation Policy: A Guide for Developing Countries’.

The lack of relevant education is a problem for the companies interviewed, who feel there are insufficient skilled workers and operators to work with modern machines. SME owners and managers complain that university and college graduates do not have the required technical and craftsman’s skills, exposure to modern technologies, or an entrepreneurial and creative attitude.

As mentioned earlier, several ministries and agencies are engaged in efforts to develop and promote innovation policy, usually labelled as Science, Technology and Innovation (STI) policy. Despite considerable effort in developing strategies and plans, actual implementation is challenging, due to the limited availability of public budgets and knowledgeable staff.

Nearly all SME owners and managers suggest that creating a stable and predictable institutional context would be an efficient and effective way to promote innovation in India. All kinds of innovation policies and programmes could be developed, but the results of such policies will be undermined by the weak and unreliable wider formal institutional context.

Another policy idea emerging from the DFID project is that several owners and managers suggest not to focus on governmental policy makers only but on direct advice to SMEs on how to improve their business. One idea is to develop non-governmental business information exchange networks and platforms, establishing contact between entrepreneurs in India and beyond, to facilitate discussion and deals within the various sectors. SME owners suggest that the DFID project could establish a network of all SME owners and

managers contacted during the implementation of EIP-LIC and create a website for them to stay in touch with each other.

*Research issues - insights to address the research questions*

The analysis of the cases reveals two types of innovators in Gujarat. On the one hand, there are owners and managers with a technical background who innovate from a technological perspective. On the other hand, the owner with an education background in management innovates in terms of HRM practices and workshop organisation, amongst others, which results in improved company competitiveness.

Another observation is related to the organisation of the labour force. Several companies have fixed employment contracts only for key technical and management staff. The production workers, sometimes children, are subcontracted via middlemen who come with their pool of workers. These are often migrant workers who work under poor conditions. The owner deals only with the middlemen.

*Theme 1 'Innovation Systems'*

The qualitative analysis of India, and also the earlier EIP-LIC qualitative studies, show the many internal and external factors supporting or hindering innovative behaviour of owners and managers of manufacturing SMEs. The econometric analyses and the mathematical model approach within the 'Innovation Systems' theme implicitly seek correlations and causal relationships between independent variables such as internal capabilities, a favourable policy context, the availability of technology, and the occurrence of innovation and innovativeness as dependent variables.

However, a limitation is that the claims of econometric analyses are true only *ceteris paribus* — that is, they are true only if there are no interferences or inhibiting factors. Critics say that the most important methodological issue is the simplification, idealisation and abstraction that characterises econometric research. However, the qualitative research element of this project shows the reality of numerous inhibiting factors. This is problematic once research outcomes are translated into policy, from which true impact is expected, and constitutes an emerging methodological challenge in terms of developing meaningful and effective policy recommendations in the EIP-LIC research project.

Moreover, innovation systems theory states that SMEs would be surrounded by a network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies (Freeman, 1987). However, it appears that the SME innovations in India are mostly in-house activities, connected with suppliers and other businesses. The same phenomenon has been observed in other Asian countries. One might expect formal technology institutions and universities to facilitate this process. However, although there are government S&T institutions in existence, it seems that the developed technologies they offer are not required by SMEs, while for the technologies they do require, no suitable technology institutions exist.

The cases suggest several firm-level factors playing a critical role in the engagement of incremental innovative activities, more than supporting institutions. The innovation process is initiated, managed and owned by the company without any external involvement or support from other businesses. Informal contacts, even within formal institutions, play a key role in some cases. It is the owners who develop ideas for innovation, with employees playing only a limited part by suggesting improvements at the operational level.

By contrast, the motivation, contacts and international exposure of the owner are key factors in engagement in innovative activities. Moreover, the availability of funds as a result of profits is essential. Regarding the risk-taking of their innovation projects, most owners and managers are confident about the market opportunities in India, the region and beyond.

There are several cases of collaborative innovative activities, with owners and managers exchanging ideas about technology and product design within the family business context. Although the companies are open to sharing information about their needs, most of the owners/managers avoid cooperation with other companies.

Regarding external networks, none of the interviewed firms has been involved in collaborative innovative activities or joint technology acquisition with other businesses or with technology institutions. Likewise, no company enjoys the spill-over of technology from larger, foreign or other technologically more advanced firms. There are no examples of large foreign enterprises subcontracting and making technology available to SMEs or exchanging information. The companies in Gujarat are very scattered and seem to have no relationship with each other.

There are virtually no links between the interviewed SMEs and public sector actors, such as universities, governments, or NGOs, as presented in the 'Innovation Systems' analytical model. The so-called innovation system, as a co-evolutionary network of actors, does not exist. Instead, the business system actors and informal institutions play a key role in providing information, technology, credit and overall stability and predictability. The role of these actors could be further explored in EIP-LIC research, with particular regard to the doing, using and interacting (DUI) approach in learning and innovation processes, as suggested by Lundvall et al. (2009).

The outcomes of the qualitative inquiry suggest that technology and underlying knowledge may not be the problem. Regarding the diffusion of technology, most of the entrepreneurs are well-informed about technological possibilities and are able to import the technology by themselves with little difficulty, provided funds are available. For most of the technical problems faced by the SMEs, there is already a technical solution developed somewhere in the world, so there is little need to develop local 'new to the world' technologies. There is therefore little need for intermediaries to bring producers and users of innovation/knowledge together. There are few 'breakthrough' technologies that could be disseminated on a wider scale, and the owners and managers seek to meet their specific needs with available technology. They can identify where to source the technology and have suppliers. In some cases, a local technician can make a copy of the machine. There is little local innovation for local problems.

#### *Theme 2 'Finance for Productivity Growth'*

Finance is not considered a critical constraint by most interviewed companies in India. In all companies, the owners aim to introduce new products and raise productivity because they see business opportunities in doing so. Today the SME owners develop their business based on bank loans and by small, incremental investment from profits. Some of the interviewed companies were given informal loans and gifts by family and friends. The owners who invest in state-of-the-art technology, to be able to face international competition, are in need of substantial investments. As the technology advances, the investment costs increase exponentially. This latter phenomenon prevents owners from taking a leap and making a large scale investment.

The Indian cases provide some insights into formal and informal financial institutions. One key issue is that banks charge high interest rates, around 11% for loans, to manufacturing SMEs, which prevents several companies from investing in technology that could enable them to increase the speed of production and broaden the range of products. The banks provide credit to 'proven' entrepreneurs of registered businesses, able to assess risk and handle a difficult business environment. The government provides subsidy programmes for SME credit.

With regard to managerial practices and innovation decisions, many entrepreneurs have confidence in the formal institutional context. Financial planning and forecasting in the Indian context are not considered a problem. The entrepreneurs are positive about the government trying to formalise the economy through the demonetisation policy. The demonetisation launched in November 2016 is Prime Minister Narendra Modi's

attempt to reduce bribery and the black economy so that India may shift towards digitalised money transfers, which are more traceable and taxable. The SME owners and managers perceived the scrapping of the 500 and 1,000 rupee note overnight (worth about £6 and £12 respectively) as an inconvenience. Nearly 87% of transactions in India use cash. Some labourers, who have bank accounts, still prefer cash. A key problem is that Indian banks can only hand out small amounts of cash, and a small bank note is no longer available. Unlike M-Pesa in Kenya, SMEs in India do not use mobile banking for business transactions.

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# Annexes

## Annex 1: List of questions for semi-structured interviews

### A. BASIC INFORMATION

1. Name of business and owner, location, legal status, years of operation, types of products, manufacturing subsector, productive activities, number of employees, management structure, some indication of turnover and profit and average investment size.
2. A short history and background of the business model. How is the company generating value? Position in a value chain if applicable, suppliers, major clients/markets.
3. Did the company grow/expand in recent years? To what extent (why) does the owner consider his/her company as an innovative company as compared to other manufacturing SMEs in India?
4. Did the company itself introduce a new product, process or technology to raise productivity or to face competition? Provide examples of product/process/technology innovations that enabled survival/growth/expansion in the past 3 years.

### B. INNOVATION

#### New

1. Description of the type of innovation (process, product, incremental, radical). What is new? Did some innovations enable/trigger other types of innovation within the company? Management innovation in terms of goal setting?
2. Is the innovation 'new to the world' involving inventions by internal R&D, or is it a copy, adaptation or adoption of an existing product or technology?
3. How do the owner, employees, clients and others actors perceive the newness? (just a small improvement or as a 'breakthrough')?

#### Process

4. Idea: Where did the idea and motivation for the innovation come from? What were the first steps in the idea formulation and who initiated these? What was difficult and what was easy?
5. Testing: What were the subsequent steps in testing? At what point in time did it become clear that the new product or process would become a success? On what basis did the owners decide to further implement/commercialise it? Did the owner try new things that failed?
6. Commercialisation: what were the steps towards the implementation? What confidence/trust provided back-up? What was difficult and what was helpful?

#### Value

7. How do product/process/technology innovations create value for the company?
8. Did the innovation increase productivity, if so how? (lowering production costs per unit, labour/capital input)?
9. Did the competitive position change as a result of the innovation, if so how? (via premium products, better, newer fashionable products and new export markets)?

### C. INTERNAL CAPABILITIES (FIRM LEVEL CONDITIONS)

What are the internal strengths and weaknesses with regard to the innovativeness of the company?



### Dynamic capabilities

#### *Sensing and shaping opportunities for product/process/technology innovations*

1. To what extent do you (and the employees) see the need/urgency to be innovative?
2. How do you or your employees identify new business/innovation opportunities?
3. Who is actively involved in identifying these opportunities?
4. How is raising productivity and competitiveness linked to identifying opportunities for innovation?
5. How do you target a new market segment? How do you consider the competitiveness of your company?
6. How is your company adjusting to customer needs?
7. How does the company select the ideas that it is willing to invest/innovate in?
8. Who is involved in this process?

### Reconfiguration of the company

9. How do you adjust by being innovative to the surrounding business environment?
10. How do you share knowledge within your company?
11. How are employees informed about new developments?
12. How does your company train employees to adjust to new developments?

### Goal setting

13. Do you have an implicit or explicit goal setting system to improve performance?
14. How do you pay employees for performance? (more salary, rewards)
15. How to you increase motivation? Is there intrinsic motivation (ambition, ownership) and external (money) motivation?

### Slack time

16. Do you give employees time to develop or try out a new approach or develop new ideas about products or services, or business processes?  
If yes:
  - What exactly was expected from employees during this time? What kind of activities should employees undertake during this time?
  - Did all the employees get some time or was it restricted to a specific group; and if so, which group?
  - Why did this establishment give employees this time? What was the goal/idea behind it?If no:  
Have you ever considered giving employees some time to develop new ideas? If yes, what was the reason for implementing it? If not, why not?

## **D. FORMAL INSTITUTIONS**

How does the owner perceive the opportunities and threats for product/process/technology innovations of the surrounding business, policy and regulatory context in Gujarat, India?

1. Is the owner aware of governmental policies/programmes in Gujarat and India that specifically aim to stimulate product/process/technology innovations in manufacturing SMEs? What are the owner's idea and perception of these governmental policies (programmes/projects)?
2. Does the company actively participate in, or benefit from, such governmental policies/programmes/regulations? (specify in what ways these stimulate the company's innovativeness)
3. What role do intellectual property rights and patent laws play in your innovation activities? Does the owner aim to patent innovations? If so, which patent office is used? Does the owner find intellectual property rights and patent laws helpful for innovation activities? Does the owner respect the intellectual property rights of others when innovating? If not, why not?

4. Are other generic governmental policies/programmes (not explicitly aimed at promoting innovation, stimulating education or providing access to finance) supporting the company's innovativeness in an effective way?
5. Do certain governmental policies or regulations prevent the owner from introducing and investing in innovation? What threats in terms of policy and government regulations emerged in the innovation process?
6. Does the company participate in, or benefit from, programmes or projects stimulating innovativeness run by NGOs and/or international development agencies? (kind of programmes/projects and impact)
7. How does the owner acquire knowledge and technology for product/process/technology innovations? When conducting innovative activities, does the company collaborate with formal bodies, such as universities, R&D centres, research institutes and so on? Why (not)? Which kind of organisation? Does the owner encounter any difficulties in collaborating with such organisations? If so, of what kind? Are these collaborations ultimately beneficial for innovativeness? If not, why not?

#### **E. BUSINESS SYSTEM, SPILLOVERS, EXPORTS**

To what extent (and how) are contacts and interactions with other businesses - local, national and international - important for stimulating product/process/technology innovations within the company? Examples?

##### Business systems interaction

1. Has the company ever introduced a new product/process/technology to suit the needs of a local client/buyer? If yes, did the client/buyer help in any way to make these changes?
2. Has the company ever followed the advice of a supplier in introducing a new product/process/technology?
3. Does the company have active business cooperation (subcontracts)? What is the nature of the cooperation and what is the benefit? Did that involve a new product/process/technology?
4. Does the company buy from or sell to any multinational firms located in India? If yes, has the company ever benefitted in any way from cooperation with these firms to develop a product or improve production techniques?
5. Where does the company typically recruit employees? Has the company ever recruited employees from a client, supplier or competitor? Were these employees particularly helpful in improving products or production techniques? Has the company recruited employees with the explicit aim of improving products or production techniques? Where did they work before?

##### Location

6. How long has the company been located at the present address? Did the company move to this address or was it created at this address? What were the main reasons why the company was moved to/founded at the present address?
7. How does the presence in the location/region affect the company's performance, innovation, growth? What is the owners' perception of the dynamics of the present location/region with regard to the businesses around (micro, SMEs, large, multinational)? What is the size of the region to which the owner refers?
8. Are the other businesses in the region similar or different in terms of size, production, sector and type? To what extent do firms produce comparable goods in the region?
9. Alternatively, to what extent are these other business hindering and competing? Does the owner see them mostly as competitors? Does that imply a need for innovation?

10. Does the company buy inputs (what, quantity) from firms located in the region? What is the quality of local inputs? Did the owners ever ask a local supplier to change a product to suit certain needs? If yes, did the company help the supplier make these changes in any way?

#### Export

11. Has the company ever exported some of its products to foreign countries? If yes, when was the first export? Has the company exported some of its output abroad in the last year? To which countries?
12. What was the main driver of the company's decision to export? Did the company actively look for foreign clients? Did foreign clients or a wholesaler contact the company (if yes how: website, fair, etc.)? How did the company hear about export opportunities or has the company ever been recommended to foreign clients? If the company was contacted or recommended, why was this the case?
13. Has the company ever improved an existing product or created a new product with the explicit aim of exporting it? If yes, was it at the direct request of foreign clients or to find new foreign clients? Did the company make improvements to comply with standards and regulations?

#### **F. INFORMAL INSTITUTIONS**

1. Family and friends (overseas)
2. Cultural perception of innovation. Is innovation something good? Or should we strive for stability and harmony in society?
3. Informal think tanks, informal knowledge through contacts with university experts
4. Rent seeking individuals, corruption
5. Hindering culture, traditions or customs
6. Social learning, collective learning
7. Community solidarity, craft traditions

## Annex 2: List of companies interviewed

Manufacturing SMEs interviewed in Gujarat in chronological order (4-14 December 2016)

	<b>Subsector</b>	<b>Products</b>	<b># of employees</b>	<b>Location</b>
1	Pharmaceutical products	Pills and medicines	600	Ahmedabad
2	Electronic engineering	Electric switch board and furnaces	8	Ahmedabad
3	Metal processing	Centrifugal castings copper	35	Ahmedabad
4	Green technology	Micro-algae and enzymes	14	Ahmedabad
5	Mechanical engineering	Diamond polishing machines	12	Ahmedabad
6	Chemicals	Dyestuffs	60	Ahmedabad
7	Electronic engineering	Electronic weapon systems	8	Ahmedabad
8	Electronic engineering	Water level measure equipment	100	Bhavnagar
9	Confectionery	Food processing	200	Bhavnagar
10	Construction and equipment	Fire extinguishers	110	Bhavnagar
11	Textiles and garments	Blue jeans	80	Ahmedabad
12	Construction and equipment	Composites	1000	Rajkot
13	Automotive	Car parts, crank shafts	80	Rajkot
14	Ceramics	Floor tiles	65	Morbi
15	Textiles and garments	Block printing fabrics	150	Ahmedabad
16	Food processing	Pressure cooker cake powder	5 + 45 distributers	Ahmedabad



### Annex 3: DFID research questions

The DFID research project takes an ‘economics’ perspective on innovation and involves econometric analysis of a set of variables concerning barriers at the firm, regional and national levels and their causalities with the *innovative behaviour/capability of entrepreneurs* and subsequently innovation and productivity. This constitutes a reductionist and deductive approach in defining variables for analysis in which the impact of individual factors on innovation is assessed by applying quantitative econometric methods (*ceteris paribus*). The DFID project key research questions are grouped under two themes:

#### Theme 1 ‘Innovation Systems’:

- What firm-level and regional-level factors hinder or foster the engagement of firms in innovative activities?
- What is the impact of in-house innovation activities versus collaborative innovative activities or technology acquisition activities on the innovative performance of firms in developing countries?
- What is the role of economic spillovers within clusters of firms in fostering economic growth and innovation?
- What are the most critical barriers to the process of innovation and the diffusion of technology in low income country settings?
- What types of links between the public/private sectors, universities, governments, NGOs and the private sector are more conducive to innovation activity?
- What is the role of intermediaries in bringing producers and users of innovation/knowledge together?

#### Theme 2 ‘Finance for Productivity Growth’:

- How does the design of formal and informal financial institutions affect firm productivity dispersion across SMEs?
- What are the firm level margins that make finance matter for productivity?
- What role do observable managerial decisions (e.g. managerial practices, innovation, product market competition, product quality, technology adoption, the location of the plant and the trade status) and managerial characteristics (e.g. gender, age, education, behavioural aspects) play in explaining the nexus between financial development and firm productivity?
- How does firms' productivity respond to exogenous developments in the financial environment?
- What are the macroeconomic implications of such development experiences?