WORKING PAPER 129

A SEARCH FOR A THEORY OF ENTREPRENEURSHIP : A CASE STUDY OF THE FOUNDRY INDUSTRY IN HOWRAH AND COIMBATORE

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A SEARCH FOR A THEORY OF ENTREPRENEURSHIP: A CASE STUDY OF THE FOUNDRY INDUSTRY IN HOWRAH AND COIMBATORE

Meenakshi Rajeev*

Abstract

This study examines the foundry industry of Howrah, West Bengal which is currently characterized by low-technology based production coupled with an attempt to undercut market price via compromises in quality. This is in contrast to the policies of similar foundry industries located in the southern part of the country, e.g. in Coimbatore. A comparison between the two has enabled us to look at the sources of problems faced by the Howrah belt. The study reveals the possible causes of the risk-averse entrepreneurial attitude which led to poor investment growth in this belt.

Introduction

There is no doubt that in India, a planner interested in economic growth in general and industrial growth in particular needs to be concerned about the small-scale sector. The sector's role is not limited to the contribution to GDP, export earning or employment generation alone. Extensions and adaptation of indigenous technologies, subject to the local availability of raw materials and labour, are features that enhance the importance of this sector. Further, low capital requirement makes entrepreneurship feasible for many. Given the importance of this sector for the Indian economy, it is useful to take a close look at some of the important statistics relating to this sector[1].

The Small –Scale Industries (SSI) Sector in India creates the largest employment opportunities for the Indian populace, next only to agriculture[2]. It has been estimated that a lakh of rupees of investment in fixed assets in the small-scale sector generates employment for four persons.

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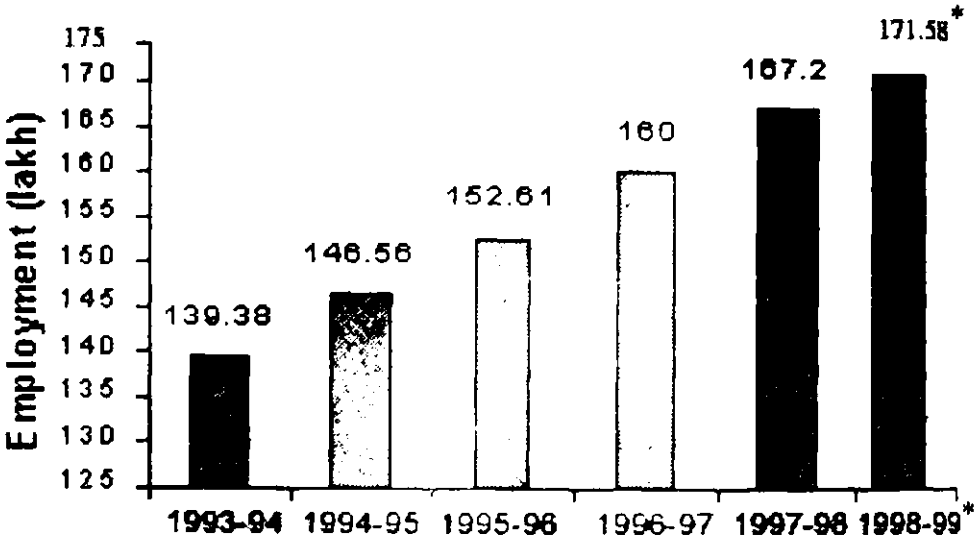
Employment in Small - Scale Sector



* Projected

Source: Website of the Ministry of Small-Scale Industries, Annual Report, 2001-02.

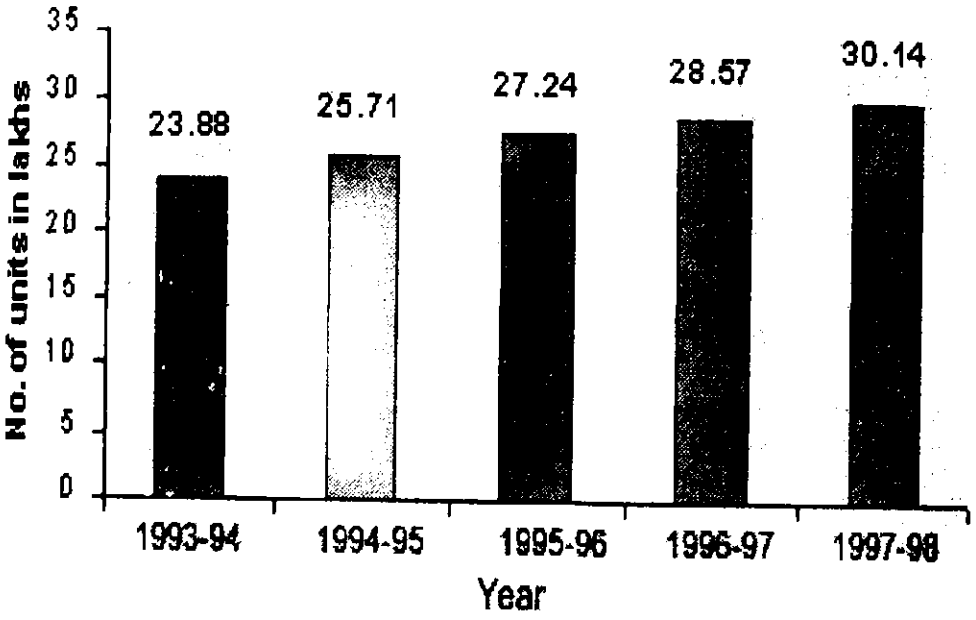
Here we take into consideration only the registered small units. The definition of a small-scale unit as of 21.12.99 is an industrial undertaking in which investment in fixed assets in plant and machinery, whether held on ownership terms or lease or hire, does not exceed Rs 10 million.

If we look at the state-wise distribution of employment in SSI sector, Tamil Nadu (14.5%) made the maximum contribution to employment. This was followed by Maharashtra (9.7%), Uttar Pradesh (9.5%) and West Bengal (8.5%), the total share of the three states being 27.7%. We note that per unit employment however is not very high in West Bengal.

The small-scale industrial sector contributes 40% of the gross manufacturing output to the Indian economy. It has been estimated that a lakh of rupees of investment in fixed assets in the small-scale sector produces 4.62 lakh rupees worth of goods or services with an approximate value addition of ten percent.

The registered small-scale sector (in terms of number of units too) has grown rapidly over the years. The growth rates during the various plan periods have been very impressive. The number of small-scale units has increased from an estimated 8.74 lakh units in the year 1980-81 to an estimated 31.21 lakh units in the year 1999. The Figure below provides information on few in between years.

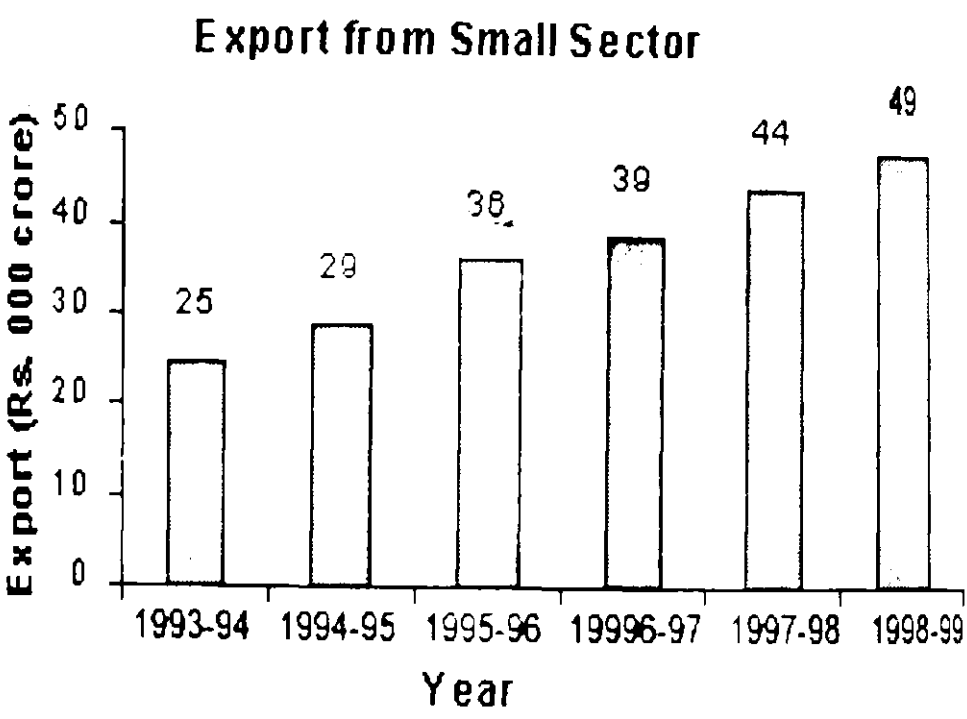
Small - Scale Units



Source: Website of the Ministry of Small-Scale Industries, Annual Report, 2001-02.
www.smallindustriesindia.com

On comparison with the performance of the industrial sector in general and the manufacturing sector in particular, one observes that the SSI sector is not left behind. The growth of the SSI sector has surpassed overall industrial growth from 1991 onwards.

As far as its share in the export market is concerned, the SSI sector plays a major role by contributing around 45%—50% to the Indian exports earnings (Annual Report, 2001-02 of the Ministry of Small-scale Industries). Direct exports from the SSI sector account for nearly 35% of total exports. Besides direct exports, it is estimated that small-scale industrial units contribute around 15% to exports indirectly. This takes place through merchant exporters, trading houses and export houses. They may also be in the form of export orders from large units or the production of parts and components for use in finished exportable goods. It is important to note that non-traditional products account for more than 95% of SSI exports (referred from www. smallindustriesindia.com). The sector in general has been exhibiting impressive growth rates in export performance during the decade of 1990s, the major contributors being the garment, leather, gems and jewellery units from this sector.



Source: www.smallindustriesindia.com

However, given the increased competition in the economy and the challenges of the WTO norms[3] , it is essential to take a fresh look at the policies concerning our small-scale sector. For example, if we consider our electronic instruments sector, small units are involved in two different categories of their manufacture viz., high-cost, low-volume products and low-cost, low-technology, high-volume products. According to the Small Industries Development Bank of India (SIDBI) report[4] most SSIs do not have the technical background or financial risk - taking ability to enter into high-tech field and rather would slog in the low technology, highly competitive market, and as a result are unable to improve productivity. Most SSIs still adopt 40 year-old technology and hence any sophisticated products have to be imported. Thus, unless appropriate policy measures are undertaken for the SSI sector, entry of competitors from other nations like China or Mexico has the potential to make the export scenario quite bleak for India.

While talking about policies[5] concerning this sector, it is essential to remember that there are innumerable sub-sectors within the SSI sector, producing a variety of goods in different regions of the country. Each such region has a distinct political and economic background and hence these units operate under differing institutional *structures,* which should not be undermined while formulating policies.

There is therefore a need to study these sub-sectors separately to arrive at a coherent picture of the structure of the small-scale industries

(SSI) sector product-wise and location-wise. In fact, the Small Industries Development Bank, India (SIDBI), has brought out a report on 'Technology for small-scale industries, current states and emerging needs'. This document deals with important technology-related problems of small-scale industries for different product groups. However, the report does not concentrate on the *institutional framework* under which these firms operate. A study incorporating the institutional factors would enable one to take a fresh look at our policies regarding the SSI sector, which are currently primarily characterized by '*subsidy and protection*'. The state of West Bengal in this regard provides some interesting and distinguishing features. In this connection, a recent paper by Banerjee *et al* (2002), which deals with the economy of West Bengal in general, shows its concern about the poor condition of the SSI sector in West Bengal in spite of having all the necessary ingredients for growth [6].

The present work is an attempt to study an important industry in the SSI sector of the state, viz. the *foundry industry*, in order to bring out the specific features that are region-based and examine the prospective policy instruments that may be necessary for its revival.

"One of the most labour-intensive industries, around 6000 foundries in the country, mostly in the SSI sector, produces nearly 3.3 million tons of castings annually (Hindu, Jan 25, 1999)." Though scattered across the country, the three biggest clusters of foundries are located in Agra in Uttar Pradesh, Howrah in West Bengal and Coimbatore in Tamil Nadu. As is well-known this industry is mainly engaged in iron casting produced by melting pig iron where hard coke is added as a fuel. Melted iron is poured in to moulds of different shapes and sizes according to product specifications. Once the iron has solidified, it can be taken out of the moulds and processed further to get a better finish.

The industries at Howrah, which initially catered to the railway industry, made the region a flourishing industrial belt in the post - Independence era with the foundry as one of its major components. In fact, it is said that the manhole covers on the roads of Paris were once all made at Howrah. Also the engineering units of the district, engaged in different products had backward linkages with the foundry industry. At present the district accommodates 152 foundries out of the 297 registered foundries in the state.

However, once the concentration of railway industries in West Bengal began to disperse to different parts of the country, almost the entire industrial belt at Howrah felt the major threat to their existence as a result of a drastic fall in local demand, compounded by the absence of product diversification as well as lack of search for alternative markets.

Of late, the condition of the foundry industry in particular is characterized by near-stagnation which the Government officials associated with this industry (like the Director of the Indian Foundry Association or

the General Manager of the Small Industries Development Bank of India, Kolkata Branch) attribute to the *risk averse and non-entrepreneurial* behavior on the part of the respective factory owners. An attempt to investigate further (methodology of the study is presented in the next section) into this perception led us to believe that it is to a large extent due to the manner in which industrial activities are organized in this belt. More precisely, our interactions with individuals associated with the foundry industry at different levels reveal that many entrepreneurs (i.e., the firm owners) have reduced themselves to being just agents who are only renting out their capital goods rather than acting in the spirit of entrepreneurship. This has been the result of heavy dependence on *outside* intermediaries for supply orders and also for labour supply, which has created distortion in the firms' activities[7]. This is not to deny that there still exist some units in Howrah district which function in an impressive manner, but their proportion is rather small. To get a better comparative scenario we also visited several foundry firms in Coimbatore and interacted with individuals and organizations related to the foundry industry. In the Coimbatore district of Tamil Nadu there are 613 registered foundry units in operation (in 1999). The absence of a large intermediary network, unlike in the case of Howrah, has given rise to a different dynamism in the same industry located at Coimbatore. Capital investment in general appears to be much higher at Coimbatore vis-à-vis the industry at Howrah. Use of technologically advanced machines has brought about a marked difference in the final quality of products as well.

On the other hand our interviews with the foundry owners at Howrah reveal that they do not consider credit as a binding constraint, rather they believe, that declining demand for their products acts as a primary bottleneck, which in turn has a dampening effect on the credit demand. However, if there is no credit constraint and, within the same country, Coimbatore entrepreneurs are finding investment profitable, why are the Howrah firms lagging behind? This question instigated us to explore the matter further.

The major problem in this entire study has been the availability of reliable quantitative data. The small foundry owners of Howrah were reluctant to provide any information relating to investment, production, cost and profit. This may be because they were not convinced of our academic intentions and were afraid of some additional tax liabilities. Absence of such data from any other sources forced us to depend on the experience we gathered through our visits and the qualitative information that has been revealed through interviews with various persons[8]. Our effort in this paper therefore is limited to 'An exploration of a theory' (rather than an econometric analysis) based on information gathered from a series of open-ended interactive discussions carried out in a number of foundries (details of methodology given below), and related associations and organizations.

Against this backdrop the paper is arranged as follows. The next section describes the methodology of the study. This is followed by a description of the technology of production, since investment in technology is our main concern. A related issue that arises out from the technology discussion is the pollution problem, which is taken up in the next section. We then move on to discuss the specific features of the Howrah foundry firms. The Coimbatore counterpart is taken up in the next section. A comparative analysis is presented thereafter and policy implications are discussed in the penultimate section. A concluding section appears at the end. A few tables are presented in the appendix.

Approach to Information

Under the broader objectives described above we initiated our study, in particular, on the foundry industry, to study entrepreneurial behaviour and examine how far it is dependent on institutional factors. In particular we intend to analyse the characteristics of the optimizing exercise that has been followed by entrepreneurs in the respective industrial clusters. If one finds qualitatively different objectives between these two centres, which one expects in this case, there is a need to look at the historical background and the institutional framework under which these firms operate.

Names and addresses of the registered foundries are available in published form, which we have used for selection of the samples. We have first selected a simple random sample of 30 foundries in Howrah out of the 152 foundries in the district (i.e. covering around 20% of the units). Though we began with a structured questionnaire canvassed personally, as mentioned above, we could not get reliable figures from the Howrah foundry owners on several quantitative variables. This is possibly because they were not convinced of our academic intentions and were afraid of some additional tax liabilities. This was then supplemented by an interactive investigation with unstructured open-ended questions. Thus the present paper is mainly based on 'selective, unstructured interactive (open-ended) investigations' and 'participant observations'.

In particular, we have interviewed the owners, accountants, labourers and contractors associated with the firms. This gives us an idea about the institutional framework under which these firms function in addition to their basic structure, the process of production used, the sources of raw materials etc.

We visited the Indian Institute of Foundrymen, Kokata Chapter and the Indian Foundry Association. The former provided us with much useful information regarding the present state and structure of the foundries, whereas the latter institution was completely uncooperative.

Both these leading institutions also could not provide us with even a rough estimate of average turnover, profit, cost or total production of the industry at Howrah. In order to get a picture of the institutional credit, we also visited the Small Industries Development Bank in Kolkata.

Names and addresses of the registered foundries are available in published form for Coimbatore also, which we used for selection of the samples from that region. We have first selected a simple random sample of 30 foundries out of 613 foundries in the district (i.e., covering around 5% of the units). This representation may look inadequate, however, we could see a consistent pattern of operation through our visits and interactions. Though resource constraint prevented us from undertaking a large-scale survey at Coimbatore, we would like to note here that the main focus of our study is to explain the characteristics of the Howrah firms. We have studied the Coimbatore firms in order to strengthen our argument about the Howrah firms. The investigation procedure at Coimbatore was the same as that at Howrah. We visited the firms and carried out interactive investigation with different stake holders like the manager, owner and labour to find out the production structure, labour-management relation, technology upgradation etc. Information gathered thereby was supplemented by participant observations. We have also interviewed the officials of the Indian Institute of Foundrymen, Coimbatore Chapter and Coimbatore District Small Industries Association. Interviews with private technical and marketing consultants were also illuminating. Chinese coke is used as fuel by most foundries in Coimabatore, which is a more efficient fuel, as its ash content is much lower than the coke produced in India. This being a feature specific to Coimbatore, we also met the Chinese coke dealers.

The Technology of Production

The basic capital equipment used to produce cast iron is the furnace. The cupola furnace, which is the most widely used, is a cylindrical structure with a base. Alternating layers of hard coke (the fuel) and pig iron are arranged in the furnace, to which limestone and other ingredients are added to get a cleaner output. Iron that comes out in semi liquid form through the side of the furnace is tapped by ladles and poured instantaneously into moulds for final casting. For each particular piece of casting, a separate mould is necessary, which has to be placed firmly on the ground, and hence land requirement for iron-casting foundries is comparatively much higher than that for other SSI units.

Moulds are prepared mainly from sand and coal dust powder and are then dried for about four hours after which molted iron is poured into them. Sand is one of the few materials which can withstand such heat. As soon as the iron solidifies within the mould, it is removed from the moulds and the sand is cleaned from the surface.

Many of the sub-operations of this entire procedure can be carried out either manually or through machines. For example, mould-making machines can make moulds faster and with more precision. The sand-moulds can be machine dried to expedite the moulding operation. Completely mechanized systems can be used for preparing the sand for making moulds. Sand *sieving*, *pouring* into the moulds and *baking* are some such jobs. After removing the castings from the moulds shot-blasting machines can clean the product to give a noticeably smooth finish. A modern addition to this system of production is the *induction furnace* where instead of coke, electricity is used as the fuel. In this type of furnace, the mix of raw materials can be altered within the furnace until the desired level of precision has been reached. This is an added advantage, especially when one is concentrating on exports. From our visit to the foundries at Howrah and Coimbatore we observed that over 90% of the (smaller) foundries at Coimbatore have at least two such modern machines, which were completely absent at Howrah.

The Pollution Problem

The foundry industry is considered a highly polluting industry and labeled as a *red category* industry. As the furnace emits a lot of smoke and dust particles, which are atmosphere-polluting, strict norms, have been stipulated of late regarding the height of the furnace. The norm depends on the circumference of the furnace. Depending on the circumference, many of the Howrah foundries had to spend 2 to 3 lakh of rupees for raising the height of the furnace. However, there was no help from the Government to meet this sudden financial requirement. Many of the smaller foundries had to wind up their business for lack of funds to implement the norms of the pollution control board. Interestingly, however, at *both* Howrah and Coimbatore, the absence of appropriate credit facilities for implementing pollution control measures has been the common complaint of the entrepreneurs.

Furthermore, another problem faced by the foundries relates to the location of the firms. According to the pollution control norms, foundries cannot be situated near a residential area. In order to meet this requirement foundries have had to shift their location from time to time. Entrepreneurs of the Coimbatore foundries have shown strong disapproval for this norm. Their assertion is that foundries are initially set-up in non-residential areas. However, after the business is established, workers start residing nearby and slowly over time the neighbourhood becomes a residential area. As a result foundries are asked to shift out. But then the same process can repeat itself leading to the need to shift out again. Using this line of argument, Coimbatore foundries are fighting against this norm in court.

Pollution problems associated with the foundry industry however open up some additional opportunities for Indian foundries. The developed countries have been closing down this industry due to their strict pollution control norms, which in turn opens up the market for developing nations, where pollution control norms are not yet too stringent.

The Howrah Foundry Industry: Specific Features

The industrial cluster at Howrah is engaged in iron casting mainly through the cupola furnace where most of the units are engaged in low-technology based production viz., hand moulding or natural sand drying processes. Their main products vary from machine parts for sugarcane-juicers or flour-grinders to implements for the tea industry. Sanitary products like manhole covers are their specialty to the extent that this product was getting exported from Howrah to various other parts of the globe, including Europe.

Though the production process at Howrah is highly labour intensive, a large proportion of the small-scale units do not have a single employed labourer. Surprisingly, they manage the entire production using contract labourer. To begin with however these industrial units did have permanent workers with numbers varying from 10 to 20. This structure, however, has gone through some drastic changes since the 1970s. During this period, 90% of the units under survey underwent lockouts preceded by labour strikes. This period also coincided with the fall in demand for foundry products from the railway industry. Around 90% of the *smaller* units we have surveyed in Howrah now have no permanent employees save the watchman and the accountant. All employees are contract labourers who work under a **contractor** and the latter, in addition to **supplying labour to the foundries**, also **brings orders for their products** from different firms (which have backward linkages with foundries) located in Kolkata (the nearby metropolitan city), Howrah and the neighbouring areas. The same intermediary (contractor) also **supervises the work** and makes payments to the labour. When casting is over, he pays the entrepreneur (owner) at the rate of Rs. 13 per kg of the finished product, which in turn he supplies to the respective nodes at a higher price.

The role of the so-called entrepreneur (i.e., the firm owner) is to supply the raw materials and provide capital services (e.g. the furnace and the land). Thus he appears to be more of a person who is renting out his capital and land rather than acting in the spirit of an entrepreneur.

The Intermediary Set-up at Howrah

Our interviews with the contractor/intermediary class reveal that a large proportion of them were previously engaged as workers in this industry

and later took on the role of intermediaries. Thus one can *hypothesize* that demand uncertainty and labour unrest created an uncertain situation for the foundries. This in turn led the entrepreneurs to prefer a non-permanent employment structure whereby they needed to pay the labourers only when there was work. Further the labour management problem would no longer be their headache[9]. Consequently, in response to this demand, there arose an intermediary class, a subset of the original set of labourers, who were intelligent enough to acquire the necessary information regarding the local sources of demand for the foundry products and had the ability to manage the labourers. The remaining labourers now work under these intermediaries on a daily wage basis. The intermediaries are not necessarily former union leaders.

The interesting point here is that 10 to 12 labourers are attached to an intermediary almost on a permanent basis. The intermediaries not only pay wages but also provide other employment benefits like accident benefits, festival bonus etc. This indicates that there exists a long term relation between the labourer and the contractor. Since no capital is required to be an intermediary, there are a sizeable number of them operating in the market, and as a result *competition prevails* between them not only with regard to obtaining orders for foundry products but also for attracting more efficient labourers through better wages. (Usually the wage ranges from Rs 40 to Rs 50). Thus an *intermediary operates in a competitive market.*

The intermediary class is widely prevalent in the small-scale and informal sector of West Bengal and usually takes the form of subcontracting. In the case of the foundry industry, on the other hand, the firm owners neither subcontract nor produce on their own. The production operation is managed and carried out by the intermediary in the factory premises of the owner. Thus, in a sense the *intermediary is playing the role of an entrepreneur* with the important deviation in that s/he has *no control over investment* (see Coase (1937)). S/he is basically leasing capital and coordinating between different factors of production.

The Coimbatore Counterpart

The major difference that strikes one in the Coimbatore industrial belt is the absence of the intermediary class. There are indeed some labour contractors who supply labourers on contract. This is mainly due to the fact that in a foundry, labour requirement is high only on days when melts are undertaken and melts usually take place twice a week. On other days the foundry is involved in mould making, cleaning of castings or in sand preparation. Ten to twelve labourers are sufficient for this job in a small foundry. It is therefore optimal to hire the extra 10-12 labourers on a contract basis on the days when one is operating the furnace, which as mentioned earlier, is usually twice a week. However, the labour

contractors are never allowed to play a dominant role in the production process. This has naturally made considerable difference to the functioning of these factories vis-à-vis their Howrah counterparts.

In addition to the technical competence, the entrepreneurial class in general has created a completely different attitude towards business for these foundry owners located in Coimbatore. For example, the Gandhi Kumar foundry, which is comparatively a much smaller foundry and whose owner is an engineering graduate, has been able to develop some castings for the pump industry, which promises more efficient functioning of the final machines. In particular, his castings are reported to help in lifting water from a deeper level at a higher speed. This is not the sole example of such innovative endeavours.

Non-dependence on any intermediary has forced the entrepreneurs to look out for markets on their own. This has enabled them to know better the market conditions, new technologies and potentially profitable investment possibilities. During our visits to various foundries we observed that there are many small- and medium-size foundries (land size wise) that on the average have much higher levels of capital investment than their Howrah counterparts. The industry has, however, benefited considerably from the overall industrial activities of the district. We therefore take a close look at the industrial profile of the district.

There is no doubt that the difference in the style of functioning between the Howrah and the Coimbatore firms is due to a large extent to the different political climates that exist in the two states. West Bengal is a state, which has been ruled by the democratically elected leftist government for a long period, which is not the case for Tamil Nadu. Though the political factors are important— analysis of these factors is beyond the scope of this paper. We would concentrate here mainly on the economic logic and the problem of incomplete information in explaining entrepreneurial behaviour.

Coimbatore District: A Profile

A quiet agricultural town ,until a few decades ago, Coimbatore today has a rich entrepreneurial culture. The soil in this district consists predominantly of black soil and is more suited to the production of cotton. Under the British rule, cotton was exported to the textile mills in England and due to the great demand for raw cotton, farmers found it profitable to engage in the production of this cash crop. The British set up the first textile mill in Coimbatore in 1888. The local entrepreneurs realized the commercial potential in setting up textile mills rather than supplying raw cotton. The first mill set up by a local entrepreneur was in 1907 and thereafter Coimbatore has witnessed a steady growth of textile mills ranging from small and medium to large units[10].

The textile machinery industry in Coimbatore produces over 80% of the spinning machinery (from bowl room to ring frames and rotors) produced in the country. The quality of the machinery is quite satisfactory, and, besides catering to the domestic market, is also exported to various developing countries. In addition, Coimbatore also manufactures automatic weaving machines and high-speed circular knotting machines.

With the commissioning of the Pykara Hydro Electric project in 1929, sufficient power was made available in Coimbatore. With this began the evolution of the pump industry, for which Coimbatore today is well-known. Today the engineering industry is producing a wide range of products like monoblocks, electric motors, domestic pump sets, submersible pump sets and deep well compressor pumps. The quality, reliability and performance of these pumps have earned a reputation for the industry and they are being exported for the last three decades. Today Coimbatore produces more than 40% of the country's requirement of motor-pump sets. Over 350 units manufacture electric motors (suitable both for industrial and agricultural purposes), and irrigation pumps (including submersible and compressor pumps), which are marketed both in India and abroad[11].

With the emergence of these industries, especially the development of the pump industry, a number of foundries have been established in Coimbatore. These provided the necessary base for the light-engineering entrepreneurs of Coimbatore to diversify and venture into indegenisation of the machinery and spares needed by their diverse manufacturing activities. In fact, over 500 foundries manufacture steel castings, ferrous castings, gray iron castings and alloy-steel castings. Apart from the substantial industrial base, which in particular created a favourable atmosphere for the foundry industry, another aspect that has helped in its development is the existence of people with technical know-how. There are quite a number of technical institutions in the district, 9 engineering colleges, 7 polytechnics and 3 industrial training centres. Interestingly, our survey shows that rather than looking for white collar jobs, many of the technical people have set up their own firms, after gaining some preliminary experience. This has helped to organize research activities and develop indigenous technologies.

Organizations for Research and Technology Upgradation

The two major institutions that play crucial roles for this industry in the region are the Institute of Indian Foundrymen (IIF), Coimbatore Chapter and Coimbatore District Small Industries Association (CODISSIA). While the IIF provides technical assistance, the latter institution gives relevant information about government norms and regulations. It organizes training programmes for small and large entrepreneurs and furnishes information regarding marketing facilities and export possibilities. Both these

institutions play a non-trivial role for the upliftment of the foundry industry of the district.

Apart from these two organizations, two other research associations also play an indirect but crucial role in technological upgradation of the products. As mentioned earlier, foundries are necessary for casting different parts of the machinery used by other industries. Therefore an improvement in the technology of an industry like textile machinery or motor & pump industry, has a direct effect on foundries. In this regard, one may mention that the South India Textile Research Association which offers services to the textile industry in constantly upgrading the technology. Also, the Small Industries Training and Research Center helps the motor and pump industry in quality and technology upgradation and consumer education. These in turn have an effect on the need for improvement of products of the foundry industry.

Apart from these, quite a few competent marketing and technical consultants are involved in market surveys and research about new technologies and work with comparatively bigger foundries on a contract basis. Our interview revealed that some of these consultants even offered their services to developed countries like France.

Howrah district on the other hand lacks such research and developmental endeavours. Further poor infrastructure adds to poor industrial growth in the state. In 1980-'81 West Bengal produced 9.8% of the industrial output of the country. During '95-'96 it declined to as low a value as 4.7%, while the overall industrial growth of the country was satisfactory. As far as infrastructure development is concerned, according to a recent study, West Bengal's position is as low as 14th amongst the Indian states in terms of an index for infrastructure'[2] (Banerjee (2002)).

A Comparative Analysis

On the basis of our survey at Howrah one can possibly arrive at the following explanations. The labour movement in the industrial region of West Bengal in general and of Howrah in particular created a feeling of mistrust between the workers and the management. Some of these movements arose out of the unionization of labour. However, there are others which are believed to have been instigated by the managements themselves in order to effect lock outs. In fact, some people argue that after the decline in demand from the railway industry for foundry products from West Bengal, iron casting no longer remained a lucrative business for the entrepreneurs of Bengal. However, given the Factories Act it is not easy to close down a factory and one way to achieve this legally may be by instigating a labour strike. Various factors may have created labour unrest and our purpose here however is not to analyse them. We are interested rather in the consequence of such problems on industrial activities.

Labour movements leading sometimes to lockouts gave rise to a system of contract labour in the factories. The new system was welcome relief for entrepreneurs, as they are obliged to pay the labourers only when there was work. Also the labour-management dispute is no longer their problem. As the system grew popular, a reasonable number of contractors entered this business, since tnere is no capital requirement for being an intermediary. Contractors are in a more advantageous position to deal with the labour as their *fixed capital is not locked up* in the case of any labour movement. Since the labourers are aware of this fact strikes and lockouts are absent in this system of operation.

Since these exogenous contractors or intermediaries now have complete hold over an important factor of production, viz. labour, they are in a better bargaining position. After the fall in demand from the railway industry on which the Howrah foundries had depended heavily, many of the original entrepreneurs chose to leave the business. In the process, many of these firms changed hands. The new owners naturally had less experience in this business. Given this background, it was a welcome situation for the entrepreneurs when these contractors also volunteered to bring in orders for manufacture and manage the hassles of payment.

This style of operation has some economic implications. One need to raise the question here, whether these foundry units really represent firms? The coherent and consistent concept of a firm as a nucleus of coordination of different factors of production is actually in the hands of the middlemen here, and they are not the owners of the firm. The owner i.e., in whose name the firm is registered and whom we are calling entrepreneur has no involvement in the actual production activity, nor does s/he bear the risk of *fluctuating, residual* income (Knight (1921)). On the other hand though s/he manages the firm, the intermediary cannot make any investment decisions.

Given this background, though the prevailing arrangement appears to be advantageous to the owner, it has its far-reaching effects in the long run. First, this process of operation has reduced the actual entrepreneur (who is supposed to be the decision maker for new investment) to a person who is basically renting out his capital equipment. A natural consequence of this non-involvement is a dampening effect on his *expectations* regarding profits or turnovers from the business. This has resulted in the *non- entrepreneurial attitude of* the actual owner having an adverse effect on the entire industry.

Second, this alienation from the actual production activity has widened the information gap for entrepreneurs (owners), especially regarding market conditions. They do not know to which market their products are bound, whether there exists a potential demand, provided they can modify their product quality or the productivity. As a result, in

the face of any demand crunch, a natural way out for a large proportion of them is to close down the unit rather than look for other opportunities, which is beyond the purview of the existing intermediaries[13]. The *information gap so* created by their alienation over time has made the *expected search cost* high enough vis-a-vis their *expected gain.*

An additional problem enhances their risk-averse attitude. Due to the present mode of operation, any new investment in capital equipment needs to be restricted to those that can be managed by an unskilled labour force. Skill formation is not possible in a set-up where labourers who come to handle a new type of machine keep changing every day. Thus an entrepreneur can invest only when the constraint on skilled labour allows him to do so and on the other hand an intermediary in general is restricted to those orders, which do not demand new capital equipment. This appears to be a vicious cycle. A large number of the factories therefore, are involved in low-technology products – trying to build a niche for themselves – with an attempt to compete through price reduction. This can be seen from the fact that in Howrah, iron casting per Kilogram was sold at around Rs 13, as against that of Rs 20 in Coimbatore (in 1999).

It should be noted here that the picture of the Howrah foundries portrayed here is not universal. There are some big foundries with modern amenities, permanent labourers and large-scale production that cater to the outside market. But the point is that their number is proportionately small and our focus here is to examine the features of small firms.

There are several causes which have promoted such differences. First and foremost is the intentional effort on the part of the Coimbatore entrepreneurs not to depend on intermediaries. Since the entrepreneurs themselves are involved in market search, the information gap is reduced which makes investment decisions much easier. The age profile of the entrepreneurs at Howrah and Coimbatore are the same. However, at Howrah they are mostly from the traditional trading class whereas at Coimbatore the entrepreneurs by and large hold technical degrees. The second factor, which has promoted investment decisions, is the technical background of the entrepreneurs. Many of these entrepreneurs either employ or are themselves qualified engineers, which helps them to take decisions regarding investment on machineries. Our survey reveals that many of the foundries are initially started by textile mill owners in an attempt to vertically integrate the process of production. Their strong entrepreneurial background definitely had a positive impact on the business. The third factor which is also believed to have substantial impact on the business, is the presence of a considerable domestic market. Industrial activities in and around Coimbatore have given a real boost to the industry and also created the necessary atmosphere for the industrial activities. In this context the contribution of the pump and textile machinery industry has been already mentioned. Also, of late, Coimbatore has started

producing different machines necessary for producing foundry products. For example, apart from several other machines even the induction furnace is being made at Coimbatore. This has not only created a demand for foundry products, but also considerably reduced the price of the machines which therefore can now be used by more entrepreneurs. In contrast, the subdued state of the industrial activity in West Bengal has badly affected the entire Howrah belt and the foundry industry in particular.

Search Cost and Optimal Behaviour: A Theoretical Formulation

One way of formalizing entrepreneurial behaviour is to use the tools of agency theory (Eisenhardt (1988) and Smith and Jensen (2000)). Agency theory is concerned with the moral hazard and other problems faced in a principal-agent framework. We try here to emphasize more on search cost in modeling the entrepreneurial behaviour.

Let us now try to represent the situation that prevailed in the two locations in terms of simple diagrams. We assume that each entrepreneur can search markets to sell their products. There is a search cost (transaction cost) which we represent by $d(e)$ as disutility from putting an effort 'e' to search, $0 < e < 1$. With probability p one can get a new order from a search that would increase the income of the entrepreneur by I [14]. In the absence of a search an entrepreneur may earn a fixed income $\underline{I}$ through the intermediary network. The probability $p = p(\underline{i}, e)$, where, $\underline{i}$ is the level of information available in the location, $0 < \underline{i} < 1$. For example, if many buyers already exist in the local market there is more information flow and hence with the same effort e, there is comparatively a higher chance of getting a new order and hence an increase in income by I. We make the following reasonable assumptions about p and d.

$p(\underline{i}, e) \geq 0$, $p(\underline{i}, e) = 0$ if $e=0$, $d(e) > 0$ if $e>0$ and $d(e) = 0$ if $e=0$, $d'(e) > 0$, $d'' < 0$,. (d" implies differentiation of d with respect to e two times)

In particular following form of the p function may be assumed given $0<\alpha<1$:

$$p(\underline{i}, e) = \underline{i}^{\alpha} e^{1-\alpha}, \text{ if } \underline{i} > \varepsilon$$

$$= 0, \text{ if } 0 \leq \underline{i} \leq \varepsilon \text{ and } e \leq e_0$$

$$= \varepsilon^{\alpha} e^{1-\alpha}, \text{ if } 0 \leq \underline{i} \leq \varepsilon \text{ and } e > e_0$$

where ε and e_0 are small real numbers (less than unity). Thus this probability function assumes that if the initial level of information is quite low and the search effort is also not high, then the chances of finding

additional marketing opportunity are nil. However, if the initial effort level is higher (than say, e_0) then even with less information to begin with one may find additional marketing opportunity with probability $\varepsilon^{\alpha}\, e^{1-\alpha}$. But if the initial information level is higher then probability is an increasing function of effort e and information level and is given by $\underline{I}^{\alpha}\, e^{1-\alpha}$.

Let $U(I)$ be the utility derived from an income I. If $I=0$, $U=0$.

Case 1: Howrah

Given the above assumptions the expected utility for a Howrah entrepreneur from putting in an effort 'e' to search for a new market is

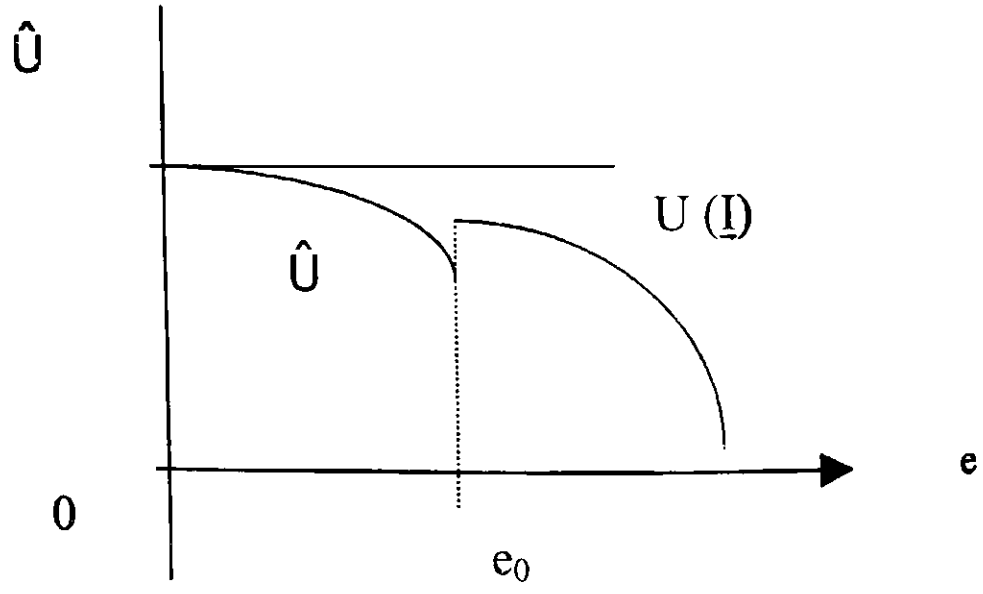
$$\hat{U} = p(\underline{I}, e)U(I+\underline{I}) + (1-p(\underline{I}, e))\,U(\underline{I}) - d(e).$$

If he does not put in any effort his utility would be $U(\underline{I})$

It can be easily checked that $\hat{U}$ is concave.

Proposition 1: If initial $\underline{I}$ is sufficiently small, in particular $\underline{I} \to 0$, then $e=0$ is the optimal solution for an owner.

Proof: Since w.r.t e, $p' > 0$ and $d' > 0$ and hence, $\hat{U}' < 0$. That is, $\hat{U}$ is a piece-wise concave function of e for $\underline{I} \to 0$ (fig.1). Also from the functional form it is clear that as $\underline{I} \to 0$ and $e \to 0 \Rightarrow p \to 0$. Hence $\hat{U} \to U(\underline{I}) - d(e)$,



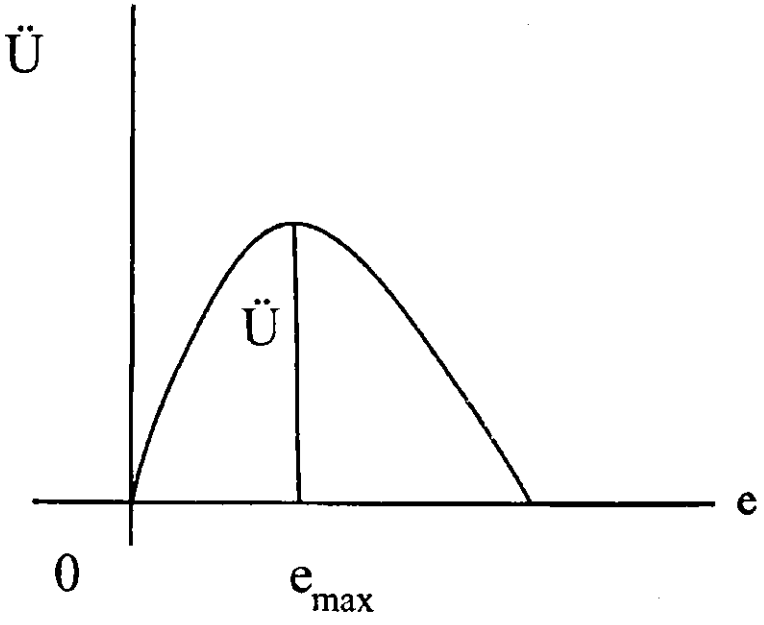
which is monotonically decreasing function of *e*. Hence from fig.1 it is clear that *e=0* is the optimal solution.

Remark: 1. Since the local market is completely captured by the intermediary, and firm owners at Howrah have no information about the possible market outside due to their alienation, the current $\underline{i}$ is close to 0. Thus, this case resembles the situation at Howrah where the firm owner's optimal effort level is 0.

Case 2 : Coimbatore

As revealed from our survey, for Coimbatore $\underline{I} = 0, \underline{i} > 0$. Hence corresponding expected utility level is

$\ddot{U} = p(i, e)U(I) - d(e)$ and $\ddot{U} = 0$ when $e=0$ (fig 2).



Thus we observe that optimal effort level for a Coimbatore firm owner, $e_{max} > 0$.

Note: If in Coimbatore we have a monotonically decreasing curve starting from (0,0), that would imply that the potential entrepreneur would never start the business.

Further once the entrepreneurs start searching for market by themselves their initial level of information increases and hence the above curve possibly would shift up over time leading to a higher level of utility.

Policy Implications

In the background of liberalisation and thereby of opening up of markets, our general policy regarding this sector should shift from being protectionist to helping the firms to be competitive[15]. Further, the two different situations relating to the same industry located at two separate locations show how a uniform policy cover may be ineffective. From our experience with the small-scale foundry firms at Howrah we observe that providing any type of subsidy (with the hope of protecting the SSI sector) to these firms will indeed be a waste of resources. This would furnish further incentive to reduce prices and capture the lower end of the market rather than to enhance investment and productivity. What is lacking in the system is *information* and the Foundry Association can play a role in this regard. Owing to the stricter pollution-related norms, in most developed countries, foundry is no longer considered a profitable industry. Thus, for the developing countries there is a potential market for foundry products, provided the quality is maintained. Only when the foundry firms at Howrah are convinced of these (demand) potentials, will investment come forth. Once a critical level of information is provided and investments are made, a virtuous circle may start. Coimbatore firms on the other hand face an entirely different set of problems and hence require a different kind of assistance. Some of the problems the firms at Coimbatore reported are the frequent change of Government regulations that in turn create uncertainty and affect investment adversely. Furthermore, export procedures are complicated. Reform in these directions may be useful.

Conclusion

In the Howrah foundry firms, the entrepreneur who is the nucleus of coordination of different factors of production, is actually in the hands of the intermediary who has no role to play in making investment decision. However, in the other parts of India there are examples of business ventures where such an intermediary network exists and the intermediary and the capitalist operate in a collaborative fashion to make investment decisions. At Howrah even with such heavy dependence on the intermediary, mistrust between the firm owner and intermediary appears to exist. Is it because the intermediary was a **worker** in the firm before? One wonders.....

Appendix:

Table A.1: State-wise SSI Units registered with small industries development organization

	Number of Units			Percentage Share to all India Total		
States	**1981**	**1990**	**1993**	**1981**	**1990**	**1993**
Andhra Pradesh	25047	85470	111082	4.8	6.2	6.3
Assam	4152	12429	15814	0.8	0.9	0.9
Bihar	25046	71408	87992	4.8	5.2	5.0
Delhi	16206	25774	27603	3.1	1.9	1.6
Gujarat	31676	78441	105283	6.1	5.7	5.9
Haryana	23492	69365	85169	4.5	5.0	4.8
Karnataka	19781	74182	96638	3.8	5.4	5.5
Kerala	19418	57738	98918	3.7	4.2	5.6
Madhya Pradesh	41367	167076	220356	7.9	12.2	12.4
Maharastra	30414	56807	66771	5.8	4.1	3.8
Orissa	9586	17619	17251	1.8	1.3	1.0
Punjab	40735	115003	13252	7.8	8.3	7.5
Tamil Nadu	30359	59931	66937	5.8	4.3	3.8
Uttar Pradesh	38853	107508	160527	6.9	7.8	9.1
West Bengal	106972	185566	268345	7.4	13.5	15.1

Source: Economic Intelligence Service, India's Industrial Sector, January, 1996.

Table A.2: Industrial dispute and man-days lost

	Number of disputes			Man-days lost ('000 days)		
States	**1980**	**1990**	**1992**	**1980**	**1990**	**1992**
Andhra Pradesh	360	470	542	553	3422	2546
Bihar	224	83	45	1021	331	495
Gujarat	258	209	162	1046	757	443
Haryana	71	64	44	362	705	1106
Karnataka	53	36	3	980	225	135
Kerala	118	40	60	1256	388	584

States	1980	1990	1992	1980	1990	1992
Madhya Pradesh	153	41	30	830	212	39
Maharastra	290	161	170	3515	5001	3245
Orissa	126	40	51	259	72	282
Punjab	90	70	29	296	301	231
Rajasthan	130	94	70	547	1306	399
Tamil Nadu	311	211	232	3707	2626	2868
Uttar Pradesh	176	101	51	856	1268	859
West Bengal	331	139	157	6236, 11,393*	6993	17666

*This figure corresponds to the year 1985

Source: Economic Intelligence Service, India's Industrial Sector, January, 1996.

Table A.3: Man-days lost due to lock-outs in the industrial sector (1000 days)

States	1985	1990	1992
Andhra Pradesh	646	299	1500
Bihar	186	130	364
Delhi	21	132	——
Gujrat	379	316	227
Haryana	4	14	960
Karnataka	631	20	0
Kerala	253	194	411
Madhya Pradesh	640	5	0
Maharastra	2868	4429	2803
Orissa	21	6	176
Punjab	41	41	54
Rajasthan	220	52	122
Tamil Nadu	908	671	843
Uttar Pradesh	107	526	533
West Bengal	10769	6592	7990

Source: Economic Intelligence Service, India's Industrial Sector, January, 1996.

Notes

1 Several papers discuss about the role of the small-scale sector in developing nations in general and in India in particular, e.g. see Gang (1995, 1992), Desai and Nisha (1990), Dhar and Lydall (1961), Andersion (1982), Ghosh (1988), Lieholm and Mead (1986), Suri (1988), White (1982), Narasaiah and Margaret (1999).

2 Source of the information on SSI sector of India provided in this section, is the web-site of the Ministry of Small Scale Industries, Annual Report, 2001-02.

3 In this connection see Rao (2002).

4 Technology for Small-scale Industries, Small Industries Development Bank (SIDBI), 2000 .

5 Often due to Government's protectionary policies relating to the SSI sector, a small entrepreneur finds it optimal to remain small and this can be counterproductive (Vepa (1988)).

6 See also Table A.1 in Appendix for the importance of SSI sector (in terms of number of units) in West Bengal.

7 The basis of such assertion has been discussed in the subsequent section.

8 The author herself visited the foundries in Howrah and Coimbatore and interacted with the personals. Resource constraints had prevented a large scale survey involving appointed investigators.

9 See table A.2 and A.3 in Appendix.

10 From CODISSIA (Coimbatore District Small-scale Industries Association) Bulletins.

11 From CODISSIA (Coimbatore District Small-scale Industries Association) Bulletins.

12 For a detailed discussion see Banerjee et al (2002).

13 As mentioned above an intermediary is usually an earlier labourer from the industry with a low education Level. Hence his/her information reach is very much limited to the local market.

14 Level 'Y'might depend on various factors, in particular on e itself. However, for simplicity we have assumed it to be fixed.

15. Regarding policy issues on rural industries see Naik (2002)

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