Final report

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Community origins of industrial entrepreneurship

Theory and historical evidence from India

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Final Report: Community Origins of Industrial Entrepreneurship: Theory and Historical Evidence from India

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The project started in April 2016 with the objective of illustrating a theoretical question: How do transitions take place from trade to industries in developing countries, where capital market is underdeveloped and occupations are often based on social networks. The illustrative example we had in mind was the entry of Indian trading groups into industry in the 19th century.

The central objective of the theory is to characterize the transition from trade to manufacturing in an economy where community networks are active. Payoffs from trade allow individuals to accumulate wealth over time. This wealth is necessary to finance an indivisible investment necessary to start a manufacturing enterprise, owing to missing credit markets. Payoffs in trade evolve over time depending on exogenous shocks in the world economy. This will affect the pattern of accumulation of wealth of traders. Owing to network relationships within a community, members of a given community will tend to operate in the same sectors and occupations, and their movements out of trade into industry will be coordinated. Besides wealth, entry into industry by a given community may also require acquisition of skill or knowledge by trading in the same sector. What brings about the entry is a shock to trading profits. A steep increase in trading profits over some period of time (which permits wealth and skill accumulation necessary to make the transition feasible) followed by a sudden crash (which subsequently motivates the traders to move into industry) is most likely to facilitate the transition. If trading profits do not decline over a sustained period, entry into industrialization will be delayed and may never happen. Accordingly, while prior acquisition of knowhow from trading in a sector may be necessary (as emphasized by John Sutton in his work on African firms), it may not be sufficient. At any rate, the timing of terms of trade shocks should help predict the date of entry into manufacturing.

The way we have proceeded in the application of the theory to the empirical context of entry of trading groups into industry in late 19th and early 20th century India. We use commodity price increase as proxy for wealth accumulation in the absence of reliable and systematic data on profits of trading firms. Trading groups moved into industry when there is decline in

profitability trade driven by exogenous shocks. We examine historical experience of India, where trading activities were in the hands of certain communities in the 19th century. We focus on two main regions: Bengal and Bombay presidencies. We identify participation in commodity trade of communities by caste and religion during the mid 1800's, who begin to move into industries activities by the final decades of the century. We focus on trade in two commodities: (i) raw cotton, a trading activity that engaged the trading communities of Bombay, such as the Parsis, Bhatias, Bohri Muslim traders and Bhaghdadi Jewish traders and (ii) jute, the main commodity traded in Calcutta by the trading community of Marwaris; We use change in relative price of the finished good to the price of raw cotton or raw jute as a measure of changes in profitability.

Over the 16 months of this project, we have a data set of entries of firms from 1860 by year in cotton textiles in Bombay. We have the names of directors of each firm, the location of the firm and for a subset the firms paid up capital. Each director has been assigned a community and is tracked over time. We have organized the data both at the individual and firm level by identifying each entrepreneur associated to one or several industrial firms. We have matched names over time to build their histories. We have created a data base of cotton merchants in 1840-65, and jute balers between 1900-15, from we can link a percentage of the entrants to their trading origins. The data has been coded with unique firm and individual identifiers and can be searched for recurrence in the dataset.

Firms are organized as upstream and downstream, and entry patterns can be observed both at the firm and at the individual level. Upstream activities comprise of firms in ginning and pressing raw cotton so that it is packaged ready for export and for use in the downstream industry, production of cotton textiles-yarn and cloth.

We have a similar data for jute firms in Calcutta. Entry at the individual and firm level is documented for Indian firms from 1900. We also have a data base for British firms in the industry from 1860s. Unlike in the case of the cotton textiles, Indian entry started only during the First World War in an industry that was dominated by British firms. We classify firms and entrepreneurs by upstream and downstream activities and build patterns both at the individual and firm level. We can also link some of the entrants to trading activities in raw jute and observe progression from upstream to downstream.

For both industries, our findings suggest that initially entries took place in upstream industries and then with a lag in downstream. Following charts and tables are illustrative of the patterns in the data.



Figure 1: Early entry of entrepreneurs in cotton industry

Figure 2: Early entry of Non-European entrepreneurs in jute industry



Cotton Industry

The cotton industry was as a consequence of the American civil war. The war saw a rise in trading profits in raw cotton as prices rose. This was following by a decline as the war ended. We analyse entry in cotton industry from two phases. In Phase 1, we focus on the period 1860-1880, where we observe an initial entry in upstream, followed by a later entry in downstream as it is shown in Figure 1. We also identify individual communities, and whether they were *Progressive Movers*, that is they move from an upstream activity to a downstream activity We also analyse matching of entrants and firms, by community. In Phase 2, we show a larger picture of cotton industry development from the early entry, from the 1880s to 1935. Only two upstream and one downstream cotton firms were set up before 1860.

In terms of industrial capital requirements, we show capital required to enter per entrepreneur by community. These requirements change between communities and across the whole period. To simplify the analysis, we define three cycles: (1) 1860-1880, (2) 1881-1905, and (3) 1906-1935.

Phase 1

Previously, in Figure 1, we showed the timing of entry into upstream and downstream sectors. There are two distinct phases of entry,- first in upstream and then in downstream. There are two peaks in upstream, during 1865-1869, and other two in downstream, during 1875-1880. Focusing on these two periods, we analysed individual entrants in each sector.

In Figure 3, we observe four main communities in cotton industry: Parsi, Bhatia, other Hindu and European. Muslims and Jewish entrepreneurs are also present although in small numbers.

Europeans were always the largest community in upstream with a lot of entry during the US Civil War. Parsis and other Hindu followed Europeans by the end of the Civil War.

In downstream, on the other hand, Parsis were the main community since early years of the US Civil War, and remained the largest group despite the later entry of Europeans in the downstream sector. Other Hindu communities entered too and together became as important as Parsi community after 1870.



Figure 3: Cumulative entry of entrepreneurs in cotton by community

In relation to the type of entrepreneurs, we analyse two categories of entrants: (i) Direct movers and (ii) Progressive movers. Direct movers are those who entered straight into the industry, while progressive mover are entrants in upstream who were merchants, and progressive mover in downstream are those who had been in the upstream sector before.



Figure 4: Type of entrant distribution in upstream



Figure 5: Type of entrant distribution in downstream

Most entrants move directly in both cotton industrial sectors. In upstream, progressive movers are relevant in period 1 and 2 (1860-1869). The "Other" type of entrant category corresponds to individuals who were in downstream before moving into upstream. In downstream, most of the entry occurred in period 4 (1875-1880), where progressive movers represented the 21% of entrants only.



Figure 6: Type of entrant distribution in upstream by community



Figure 7: Type of entrant distribution in downstream by community

Parsis and Europeans were progressive movers in the upstream, but direct movers are typical of all communities. Similarly, in downstream period 4, across all communities, direct movers were the main type of entrepreneurs. This suggests that prior skill may not have been that important in decisions of entry.

We observe for period 2 in upstream, and period 4 in downstream that when new entrepreneurs enter into the industry, they mostly join firms from their same community.



Figure 8: Community match between upstream entrant and firms

Figure 9: Community match between downstream entrant and firms



We classify as "*Same community*" when an individual entrant joined a firm whose majority of directors were from the same community. In Figure 8, we show how Bhatia and Parsee entrepreneurs mainly entered into firms from their same community. Among Parsi entrants, 76% of them entered into Parsi firms, while 71% of Europeans and 66% of Bhatia followed the same pattern.

In downstream, presented in Figure 9, the community match is slightly larger for Parsi, but lower for Bhatias (57%), and Europeans (65%). Community effects seems to be stronger at

firms level. Possible reason of the dilution of the community match for Hindu groups, including the Bhatias could be the lack of technical knowledge about the industry. Most of the technicians in the industry in the early phase were either British or Parsi.

Phase 2: Firms entry

After 1880, we collected data every five years to have better understanding of how the cotton industry developed from the US Civil War, through First World War, until 1935, right after the great depression in 1929. Phase 2 is divided into two cycles: cycle 2 from 1881 to 1905 and cycle 3 from 1906 to 1935.

During cycle 2, 1881-1905, there are two entry waves of firms in downstream, around 1885 and 1900. Firms in upstream entered close to 1900 only. Entry slowed down thereafter. Figure 10: Firms entry in cotton industry



In terms of communities, we observe how Parsis set up firms first in upstream and later in downstream. Figure 11 shows how Parsis are clearly the main community in both sectors up to 1930, followed initially by European in upstream, and then by other Hindu communities since 1900 in both sectors.¹ Europeans stayed mainly . Hindu groups became important in downstream over time.

¹ The Hindu group is composed by several communities we have not classified yet, although together, they gained a large participation in cotton industry after 1900.



Figure 11: Cumulative entry of firms in cotton by community

Phase 2: Entrepreneur entry

The entry pattern of entrepreneurs shown in Figure 12 is similar to firms. Entrepreneurs mainly entered during 1906-1915, in both upstream and downstream. However, entry levels are mostly larger in downstream than upstream.



Figure 12: Entrepreneurs entry in cotton industry

At community level, we observe in Figure 12 how Europeans have the largest community presence in upstream sector along the whole period. On the other hand, downstream is first led



by Parsis, and from 1905 onward by the Hindu communities.

Capital requirement to enter into cotton industry

We look at capital required to enter both at the level of firm and individual. From the firm panel, we present descriptive statistics by communities, in relation to the number of entrepreneurs, the capital per entrepreneur and the total capital per firm.

Firm	Cycle	Num. of entrpr.	Capital per entrpr.	Capital per firm
Community		(mean)	(median)	(median)
Bhatia	1860-1880	4.8	100,000	500,000
	1881 - 1905	3.8	88,000	352,000
	1906-1935	3.5	57,000	150,000
European	1860-1880	3.9	125,000	350,000
	1881 - 1905	3.8	93,750	375,000
	1906-1935	1.9	170,000	625,000
Hindoo	1860-1880	4.4	83,333	340,000
	1881-1905	4.6	22,500	100,000
	1906-1935	3.6	37,500	200,000
Muslim	1860-1880	3.9	116,667	400,000
	1881 - 1905	4.3	100,000	500,000
	1906-1935	3.0	$65,\!625$	105,000
Parsee	1860-1880	5.1	150,000	725,000
	1881 - 1905	5.0	33,333	200,000
	1906-1935	4.2	23,214	100,000

Table 1: Capital requirements at firm level in cotton upstream

Firm	Cycle	Num. of entrpr.	Capital per entrpr.	Capital per firm
Community		(mean)	(median)	(median)
Bhatia	1860-1880	6.0	145,833	875,000
	1881 - 1905	4.2	150,000	750,000
	1906 - 1935	4.3	193,750	1,162,500
European	1860-1880	5.5	104,167	600,000
	1881-1905	3.0	137,000	800,000
	1906 - 1935	3.8	266,048	1,000,000
Hindoo	1860-1880	5.9	130,000	750,000
	1881 - 1905	5.3	138,953	800,000
	1906 - 1935	5.2	133,333	700,000
Muslim	1860-1880	4.4	166,667	750,000
	1881 - 1905	5.0	142,857	900,000
	1906 - 1935	2.9	221,429	$1,\!350,\!000$
Parsee	1860-1880	5.3	187,500	1,000,000
	1881 - 1905	4.5	150,000	1,000,000
	1906 - 1935	5.6	200,000	1,300,000

Table 2: Capital requirements at firm level in cotton downstream

The number of entrepreneurs per firm decreased in cycle 3, in all firms and across all communities. The capital per entrepreneur and total capital per firm was also lower in cycle 3 compared to the two previous cycles. The average number of entrepreneurs per firm also decreased in all firms but Parsis The total capital required increases in cycle 3 for all community firms.

Jute Industry

This industry was different from cotton in terms of ownership by community. The industry was set up by European entrepreneurs and remained almost entirely so until the First World War. During Phase 1, all firms were European, and only few Non-European entrepreneurs came to join them.



Figure 14: Firms entry in cotton industry

Figure 15: Non-European entrepreneur entry in cotton industry



The industry was set up by European entrepreneurs and remained almost entirely so until the First World War. Only after 1900, in Phase 2, is where we start observing a larger participation of Non-European entrepreneurs in upstream sector. The participation in upstream of Non-

European entrepreneurs became even larger, just before the I World War. After the War, the entry in upstream start decreasing while increasing in downstream where we observe the first flow of entre between 1915 and 1920, and the highest entry during 1925-1929.

Comparing entry at firms and entrepreneurs level in Figures 14 and 15, we can infer that most of Non-European entry in jute happened within European firms. When Indians began to enter the industry, we observe entry differences in community presence between upstream and downstream sector using data at individual level.

In Figure 16, we observe two main Indian communities in this industry: The Marwaris and the Bengal. Both were present in the upstream before the I World War with a larger number of Bengali across the whole period. In downstream, Marwaris were the most important Non-European community, and they entered after the I World War. Other communities, such as Jewish, Bengali and Muslims entered in downstream sector, but they are small in number.





Capital requirement to enter into jute industry

Given the low number of Non-European firms, we check capital requirements at individual level, regardless the main community within the firm. Additionally, we present descriptive statistics by communities, in relation to the number of entrepreneurs, the capital per entrepreneur and the total capital per firm.

Individual	Cycle	Num. of entrpr.	Num. of firms	Capital per entrpr.
Community		(mean)	(mean)	(median)
Bengali	1860-1880	-	-	-
	1881-1905	4.7	1.0	25,000
	1906-1935	2.2	1.0	20,000
Hindoo	1860-1880	-	-	-
	1881-1905	-	-	-
	1906-1935	1.0	1.1	-
Jewish	1860-1880	-	-	-
	1881-1905	4.0	2.0	62,500
	1906-1935	-	-	-
Marwari	1860-1880	3.0	1.0	133,333
	1881-1905	2.2	1.0	131,250
	1906-1935	1.5	1.0	200,000
Muslim	1860-1880	-	-	-
	1881-1905	-	-	-
	1906-1935	3.0	1.0	20,000
Parsee	1860-1880	-	-	-
	1881-1905	1.0	1.0	-
	1906-1935	1.5	1.0	31,250

Table 3: Capital requirements at firm level in jute upstream

Table 4: Capital requirements at firm level in jute downstream

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Individual	Cycle	Num. of entrpr.	Num. of firms	Capital per entrpr.
Community		(mean)	(mean)	(median)
Bengali	1860-1880	4.0	1.0	-
	1881-1905	-	-	-
	1906-1935	4.0	1.0	342,720
Hindoo	1860-1880	-	-	-
	1881-1905	-	-	-
	1906-1935	4.8	1.0	600,000
Jewish	1860-1880	-	-	-
	1881-1905	3.9	1.0	300,000
	1906-1935	3.5	1.0	633,333
Marwari	1860-1880	-	-	-
	1881 - 1905	-	-	-
	1906-1935	4.1	1.0	833,333
Muslim	1860-1880	-	-	-
	1881-1905	-	-	-
	1906-1935	5.5	1.0	1,333,333
Parsee	1860-1880	-	-	-
	1881-1905	-	-	-
	1906-1935	1.0	1.0	-

The number of entrepreneurs per firm shows the size of the firm in terms of directors. Regarding to capital requirements, it is clear that the amount needed in downstream is at least for times larger than downstream.

Conclusion

The data collection is more or less complete now. We also have collected data on entry into industry up to 1951 using industrial censuses. We are in the process of analysing the pattern of early entry in cotton and jute using the data for an academic paper. Following this we will look at other features of entry into industry right up to Indian independence. Chettiars will feature in this as a community.

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