From Farming to International Business: The Social Auspices of New Entrepreneurship in a Growing Economy *

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Abstract

Entrepreneurship has been traditionally concentrated in the hands of a few small communities in most developing economies. As these economies restructure, it is evident that these communities will be unable to satisfy the increased demand for new entrepreneurs. The analysis in this paper suggests that entrepreneurs without a family background in business will fill the gap, even in industries where connections matter a great deal, using their own community networks to support business activity. The theoretical framework indicates that these networks will actually grow most vigorously in communities with poor outside options once they do crystallize. Using new firm-level data on the Indian diamond industry, the empirical analysis verifies this prediction, documenting the important role played by an underlying community network in the expansion from agriculture to international business in one historically disadvantaged community over the course of a single generation.

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1 Introduction

Entrepreneurship – the successful establishment and management of new business – plays a critical role in the development process. Following Banerjee and Newman's (1993) seminal contribution, the dominant view among development economists today is that inefficient credit markets can create substantial barriers to entry among potential entrepreneurs, with negative consequences for both growth and distribution. Although empirical tests of this hypothesis have provided mixed results (McKenzie and Woodruff 2002, Paulson, Townsend and Karaivanov 2006), it has nevertheless had a major impact on development policy, with numerous efforts initiated worldwide to provide micro-credit to fledgling entrepreneurs.

Most micro-credit initiatives focus on small business, such as managing a shop or engaging in petty trade, and the two studies listed above, for example, report a median investment of less than one thousand dollars among the enterprizes that they sample. This paper is concerned, in contrast, with business activity at a much larger scale that generates substantial employment and potentially has a greater impact on long-run growth. Within this class of potential entrepreneurs, the personal security that may be necessary to receive a bank loan is unlikely to be a constraint. What might matter more for them is a family background in business. Success in business requires a knowledge of commercial practices and an ability to identify potential opportunities and take risks that are difficult to acquire from the outside. Community-based business networks also provide credit, insurance, and connections to buyers and sellers to their members throughout the developing world (Fafchamps 2001, Rauch and Trinidade 2002). Under these circumstances, a potential entrepreneur who does not have the good fortune to be born into a business community is at a distinct disadvantage, creating a barrier to entry into business that could stifle growth.

In India, as in many emerging economies, entrepreneurship has been historically concentrated in the hands of a few communities. The Indian economy has been growing rapidly since the early 1990s and is expected to continue to grow at this rate for many decades in the future. It is evident that a few small business communities will be unable to satisfy the increased demand for new entrepreneurs that must accompany such high rates of growth. Thus, a critical question for India's prospects and its ability to emerge as a global economic power is whether it will be able to draw from a wider pool of entrepreneurial talent in the future.

Weber's (1958) pessimistic prognosis for India's economic future was not based on credit market

imperfections, but on the rigid caste-based nature of Indian society, which he believed was inherently hostile to occupational mobility and, by extension, to business and entrepreneurship. This explained why Indian business was historically dominated by a single caste-group, the Vaishyas, and by non-Hindu communities such as Jains and Parsis. Modern historians such as Chandravarkar (1985) and Rudner (1994) have argued, in contrast, that occupational mobility has occurred on occassion, even in this caste-based society where connections are so important, when new entrepreneurial opportunities became available. In their view, mobility was historically facilitated through the endogenous formation of new networks in groups without a prior business background. This paper provides formal support for this conjecture by documenting the role of a new community-based business network in supporting the expansion from agriculture to international business in one community – the Kanbi Patels – in one important Indian industry – the diamond industry – over the course of a single generation.[1]

India does not produce rough diamonds. The rough diamonds must first be imported, typically from Antwerp, and then cut and polished in factories and workshops, most of which are located in the city of Surat, north of Bombay. The polished diamonds are subsequently sold on the Bombay market to foreign buyers or shipped directly abroad. A combination of commercial acumen and cheap labor facilitated the rapid expansion of the diamond industry, which accounts for roughly 14% of India's total merchandize exports, and has competed with textiles, and more recently with computer software, as the country's top export industry over the course of the past three decades. It is estimated that the Indian diamond industry employs over a million workers and accounts for as much as 85% of the rough diamonds cut and polished worldwide (60% by value) today (GJEPC 1998, Purani 2000).

Although much has been made of India's software industry and the growth of its economy more generally over the past decade, the diamond industry has also grown rapidly, at an average rate of 10% per year since the mid-1970s, for the most part outside the public eye. Diamond firms are notoriously secretive, partly due to the high value and hence the security concerns associated with their product. Diamonds, particularly rough diamonds, are also difficult to value objectively and can be easily swapped, and so diamond transactions rarely involve written contracts. Trust plays an important role in this industry, which is not surprisingly associated with a high degree of community networking, and with it low transparency, world-wide. Hasidic Jews historically controlled the Antwerp market,

[1] Although networks may serve a useful purpose when markets function imperfectly, these collective arrangements can give rise to dynamic inefficiencies that constrain the individual's response to new opportunities (Greif 1994, Kranton 1996, Rauch 2001). Recent evidence from urban India indicates that *traditional* caste-based networks can indeed *restrict* mobility (Munshi and Rosenzweig 2006). The analysis in this paper suggests, in contrast, that *new* networks might at the same time be forming to *facilitate* mobility in growing economies.

and in India two traditional business communities – Gujarati Jains from the town of Palanpur (known in the industry as *Palanpuris*) and *Marwaris* originally from the state of Rajasthan – have dominated the industry from its inception in the early 1960s. The commitment problems that arise naturally with diamond transactions would suggest that there are enormous barriers to entry for outsiders in this industry. Nevertheless, the Indian diamond industry has undergone a dramatic change in its sociological composition over the past two decades – with the entry of a new community into the business – which we will attempt to understand in this paper.

Historically, the Palanpuris and Marwaris handled the business end of the industry, leaving the cutting and the polishing to Kanbi Patels (known in the industry as *Kathiawaris*). The Kathiawaris are farmers from Saurashtra in the interior of Gujarat, many of whom migrated to Surat to work as laborers in the diamond industry when it started to grow in the early 1970s. Some of these migrants became manufacturing contractors, in charge of entire workshops or factories, and these contractors in turn brought more members of their caste to work in the Surat industry. Commitment problems arise at the manufacturing stage as well, with swapping of roughs being a common complaint, and so most Marwari and Palanpuri businessmen built long-term relationships with their Kathiawari contractors. In the mid-1970s, an exogenous increase in the world supply of rough diamonds, which could not be handled by the existing business networks, led some of these businessmen to open the door to the diamond trade to their trusted Kathiawari contractors. Bank credit has, until recently, been unavailable to diamond firms for good reason, due to the particular nature of this business. Thus, the critical step in the diamond trading process is accessing rough diamonds on credit from abroad. Palanpuri businessmen, who had established branches in Antwerp by that time, provided excess roughs to their contractors or served as guarantors for other suppliers. The early Kathiawari entrants took advantage of this opportunity to bring other members of their community into the business, providing connections to rough suppliers in Antwerp and other forms of support, and the number of Kathiawari firms subsequently grew rapidly over time.

The theoretical framework developed in this paper shows that industry-specific networks will strengthen most rapidly in communities with poor outside options. Although the Palanpuris and particularly the Marwaris have many business opportunities outside the diamond industry, the next best option for Kathiawari entrepreneurs is farming or perhaps managing a diamond workshop in Surat, neither of which is particularly remunerative. We thus expect that once the Kathiawari network had crystallized, in response to the new business opportunities that became available, it should

have strengthened more rapidly than the networks in the established business communities. Networks are by their nature difficult to observe and so I take an indirect approach to support this claim by studying changes in firm characteristics and performance, across communities and over time.

The empirical analysis in this paper is based for the most part on a survey of nearly 800 diamond export firms, with offices in the Bombay market, that I conducted in 2004-05. The survey collected information on the senior partner's personal and family background, the firm's history, and business relationships over time. Given the importance of a family background in business, particularly in an industry like the diamond industry where connections and commercial acumen are so useful, I measure entrepreneurial ability by the individual's father's occupation, specifically by whether his father was a businessman. Based on this measure of ability, as well as on other measures such as education, we see that the ability of the Kathiawari entrants declines more steeply over time than their Marwari and Palanpuri rivals, consistent with the view that their rapidly strengthening network was compensating for the arrival of increasingly weak entrants at the margin. Although most of the early Kathiawari entrants had family backgrounds in business, by 1990 over 60% of the entrants were the sons of farmers, highlighting the role that their network played in supporting occupational mobility in an industry with substantial barriers to entry. An analysis of firm performance across communities and over time provides independent support for this conclusion, while inspection of intra-industry marriage patterns suggests a mechanism through which the Kathiawari network grew so strong.

Will the supply of entrepreneurial talent constrain growth in the future? We see in this paper that an exogenous increase in the demand for entrepreneurs in the Indian diamond industry gave rise to a new network that allowed entrants from a community without a background in business to enter. The network actually grew most vigorously in this community once it did crystallize. Based on the theoretical framework and the empirical results, obtained in an industry where there are substantial barriers to entry, I will argue in the concluding section that there is no reason why the experience of the diamond industry should not be replicated in other dynamic industries and other growing economies. I will also argue in that section, based on recent developments in the diamond industry, that standard solutions to stimulate entrepreneurship, such as the infusion of bank credit, could have unexpected negative effects in industries where networks and markets co-exist.

2 The Institutional Setting

2.1 Entrepreneurship in India

"The history of the rise and growth of a modern business class in India is largely the history of the activities of members of certain groups" (Gadgil 1959: 16). One broad caste group, the Vaishyas, traditionally controlled money-lending and trade in India, with sub-castes or *jatis* drawn from this group active in different regions of the country. Mercantile opportunities expanded considerably with the arrival of the British in the eighteenth century and, not surprisingly, these opportunities were captured by the traditional business *jatis* and by a few non-Hindu communities such as the Jains and the Parsis.

Commercial activity under the British was concentrated around the ports of Calcutta and Bombay. Parsis and Gujarati Banias dominated Bombay's textile manufacturing, finance, and foreign trade from the middle of the nineteenth century (Nafziger 1971). Commercial activity in Calcutta was already controlled by Marwari traders and bankers, originally from Rajasthan, by this time. Although the Marwaris made the transition to industry relatively late – around 1914 – they subsequently rapidly expanded their industrial and trading activities throughout the country (Lamb 1955).

The Marwaris, Parsis, and Gujarati trading *jatis* continue to dominate modern industry and banking, especially in major cities such as Bombay and Calcutta. For example, Timberg (1978) reports that 23 of the 37 largest North Indian owned industrial houses listed in the *Monopolies Inquiry Commission Report* of 1964 were Marwaris and Gujaratis. Timberg also cites a Time Magazine article (March 1, 1963, p. 77) in which it is estimated that the Marwaris controlled 60% of the assets in Indian industry at that time. More recently, a Times of India article (October 20, 2006) estimates that Gujarati promoted companies account for 17% of the market capitalization of the BSE-500 index, followed by Marwari promoted companies with 11% and Parsi promoted companies with 8%. Public sector units, including banks and oil companies, account for 25% and all other companies, including multinationals, just 39% of the market capitalization.[2] A few communities such as the Sindhis and the Punjabi Khatris have gained prominence in Indian business after independence, but these communities were already engaged in commerce before they migrated to India from Pakistan in 1947.

The fact that traditional business communities continue to dominate mercantile activity in India does not imply that outsiders will not step forward in the future. There are some notable examples

[2]The market capitalization of the BSE-500 index is 92% of the total BSE (Bombay Stock Exchange) market capitalization.

of non-mercantile communities making the transition to business when new opportunities became available, such as the entry of the Parsis into trade and industry under the British (Medhora 1965) and more recently the expansion of the Gounder community in Tamil Nadu from agriculture to textile manufacturing and exports in Tirupur (Cawthorne 1995). We know very little about the economics underlying such occupational mobility and so it seems especially relevant to study the expansion from agriculture to business among the Kathiawaris.

2.2 A Brief History of the Indian Diamond Industry

The history of the modern Indian diamond industry begins in the 1880s when two diamond merchants from the town of Palanpur in Northern Gujarat, Surajmal Lallubhai and Amulakh Khubhchand Parikh, expanded their business to Bombay, Calcutta, and Rangoon.[3] Over the next two decades, many Palanpuri Jains followed these pioneers into the diamond business, and later the pearl trade, and the Palanpuri network reached as far as Antwerp, where 20-25 families were settled by 1937. The overseas Palanpuris were forced to return to India during World War II and the industry suffered a further blow after independence in 1947 when the import of rough diamonds was banned to preserve scarce foreign exchange. The diamond business was restricted to domestic trade in polished stones, for the most part, until the early 1960s, when the Multi-Rate Import Replenishment Scheme allowed rough diamonds to be imported once again, against the export of rough diamonds.

Workshops were quickly set up in Surat, Navsari, and other inland centers to cut and polish diamonds and the industry grew extremely rapidly thereafter. Marwari businessmen also entered the diamond industry at this time. The Marwari network is more diversified, both spatially and by business activity, than any other community network in the country. Some of the new Marwari entrants had experience in the colored-stone business, which was traditionally centered around the city of Jaipur in Rajasthan, but other merchants were attracted by the high rate of return on investment in the diamond industry.

In these early years, the Palanpuris and Marwaris handled the trading end of the diamond business, while Kathiawaris cut and polished the diamonds. The Kathiawaris are a caste of cultivators who worked historically as sharecroppers and laborers in Saurashtra, an arid region in Gujarat that is prone to drought and famine. The first Kathiawari migrants came to Surat in the 1960s, just as

[3]The discussion on the Palanpuris in this section is based on Chhotalal (1990) and an unpublished interview with the (former) Nawab of Palanpur conducted by Mark Boston and Sharada Dwivedi. The discussion on the Kathiawaris that follows is drawn from Engelshoven (2002).

the diamond industry was starting to grow. Initially the Kathiawaris worked in factories owned by Palanpuris and local Surtis. However, many of the early migrants were able to set up their own workshops and factories by the early 1970s, doing contract work for Palanpuri and Marwari exporters. As discussed earlier, some of these contractors were encouraged to enter the import-export business in the mid-1970s by Palanpuris with whom they had established close personal ties, and we will see that the Kathiawari network grew at least as fast as the Palanpuri and Marwari networks in the decades that followed.[4] What is most remarkable about this rapid growth is that the Kathiawari network had to draw from a pool of potential entrepreneurs with no family experience in business to expand, whereas the Palanpuris and the Marwaris belong to communities with many generations of business experience.

2.3 The Survey

Although aggregate diamond statistics are available over many years, detailed firm-level information could only be obtained by conducting a survey of the industry. Diamond firms are very secretive and so every effort was made to establish connections within the industry before the survey commenced. Assisted by a few close personal connections within the industry, I gradually built up a small network of influential diamond exporters over a two-year period, which in turn later helped the survey team penetrate each of the community networks. Despite this strong support, it was a challenge to gain access to the firms, and the implementation of the survey itself provides useful insights into the workings of this industry.

The sampling frame for the survey was based on a computerized database maintained by the Gem and Jewelry Export Promotion Council (GJEPC) of all its members. This database includes the name of the firm, its address and telephone numbers, the name of a contact individual (typically the senior partner), and the firm's export figures, each year from 1995 onwards. Under the Multi-Rate Import Replenishment Scheme, a firm's foreign exchange quota, which allowed it to (legally) import roughs, was based on its previous exports. The GJEPC verified the export figures for its members and then forwarded them to the Government of India. Most exporters availed of this useful service, and so the

[4]The respondents in our survey report an average relationship of 16 years with their manufacturing contractors so it is easy to see how a high level of trust could be sustained across community lines in this case. The fact that the early Kathiawari entrants were supported by Palanpuris is not disputed in the diamond industry, although individual firms are reluctant to admit that they were assisted in this way. Statements such as the following are often heard: "'Kathiawadis are here because of the Palanpuris' admits a Kathiawadi diamond merchant. The Palanpuris, who were the market leaders brought the Kathiawadis into the trade. Help came not only in the form of finance but as initiation into the import-export sector." *Diamond World* (November-December 1999: p.52-53).

GJEPC database provides us with a fairly exhaustive list of firms that exported polished diamonds, each year, over the past decade. I was able to gain access to this database, covering the 1995-2003 period, at the beginning of 2004.

For security reasons, diamond markets tend to be spatially concentrated world-wide. In Bombay, the polished diamond market covers approximately 0.25 square miles in the Opera House area of the city. Hundreds of the larger firms have offices in two buildings – Panchratna and Prasad Chambers – and the smaller firms are crowded into buildings in the adjacent lanes and by-lanes. Somewhat surprisingly, however, a preliminary inspection of the GJEPC database revealed a significant fraction of firms with addresses outside the Opera House area. Diamond firms often operate under multiple names to exploit income tax loopholes and many of these "shell" firms are listed in residential areas where the diamond merchants live. In an economy where foreign exchange was until recently tightly regulated, the import-export nature of the diamond business also attracted firms, known in the industry as *choprawallas* (book-keepers), that were engaged in money laundering rather than legitimate diamond business. Many of these firms would also be listed outside the Opera House area. My industry contacts assured me that firms with legitimate activity in the diamond industry would have at least one office in the Opera House area and so the sampling frame for the survey was restricted to the 1,854 firms with addresses in that area, listed in the GJEPC database as exporting in any year over the 2001-03 period.

To test its ability to gain access to these firms, the survey team sent letters of introduction from the chairman of the GJEPC and the principal investigator to 40 firms drawn randomly from the sampling frame. These firms were subsequently contacted by telephone to arrange an appointment, but only three agreed to be interviewed. It was clear from the outset that the only way to achieve a reasonable response rate in such a heavily networked industry was to use our own social connections. A computerized referral system was set up, and each firm in my personal network provided a list of firms that it was tied closely with. These firms, in turn, provided additional referrals, and the process continued until all the names on the sampling frame had been exhausted. Progress was slow to begin with, and only 63 interviews were completed in December 2004, the first month of the survey. However, the pace increased thereafter, to six interviews per day, and the survey was ultimately completed in five months.

Of the 1,854 firms in the sampling frame, we were able to ascertain that 480 were multiple-name listings, 288 were *choprawallas*, 102 could not be contacted by phone, 53 had shut down, and 9 had no

partners in town during the survey period, leaving us with 922 eligible firms. We ultimately interviewed 777 firms, giving us an overall response rate of 84.3%.[5] Among the firms that we interviewed, 96.3% belonged to the three major communities and of these firms, 29% were Kathiawari, 17% were Marwari, and 54% were Palanpuri. When providing referrals, our contacts were simply asked to list firms that they were closely tied with, without any prompting from our side. It is worth noting that not a single referral led us to a firm without at least one office in the Opera House area, justifying the spatial restriction placed on the scope of the sampling frame. Moreover, only 5.7% of the sampled firms did not appear in the GJEPC database, supporting the assumption that this database effectively covers the entire population of active exporters.[6]

The sampled firms are all currently active. Much of the analysis in this paper is concerned with changes in the industry and so we would, in principle, need information on exit as well. Fortunately, exit rates in the diamond industry are extremely low, consistent with the theoretical framework in Section 3, which predicts that firms should not exit once they enter this industry. The GJEPC database lists all exporters, each year, over the 1995-2003 period. I assume that a firm exits in a given year if it was exporting in that year but fails to show up thereafter. It seems reasonable to assume that a firm which fails to show up continuously for three years or longer has permanently exited, allowing me to compute exit rates each year from 1995 to 2000. Restricting attention to firms in the Opera House area, exit rates are low each year – just around 1.5% – and there is no discernable time trend in these statistics. Moreover, exit rates do not vary by community.[7]

The computerized system that we had set up to schedule interviews included data fields to record the identity of up to five individuals who had provided referrals for each firm. We would speak on behalf of these individuals when arranging interviews with the firms; in many cases this was sufficient

[5]The firms that could not be contacted using the phone number provided by the GJEPC or traced through the directory enquiry system had either changed their name or shut down. Firms without a partner in town over a five month period are also unlikely to be active in the export market. The response rate across communities was 85.7% for the Kathiawaris, 89.3% for the Marwaris, and 81.9% for the Palanpuris.

[6]Towards the end of the survey, respondents were provided with a list of firms from the sampling frame that were still to be contacted. The survey team also made 36 appointments in the final month of the survey by telephoning exporters directly. While these few deviations from the usual procedure would naturally reduce the number of referrals made outside the sampling frame, they are unlikely to undermine the basic claim that the GJEPC database effectively covers all active exporters and that it is appropriate to restrict attention to firms located in the Opera House area.

[7]The contact names included in the GJEPC database, together with a detailed knowledge of firms in the industry, allowed my contacts and their employees to assign a community affiliation to each firm in the database that was located in the Opera House area. Names are a good indicator of community affiliation, and comparing this assignment to the actual affiliation, obtained from the survey, just 6.3% of the sampled firms were miscoded. Based on the assigned community affiliation, annual exit rates over the 1995-2000 period are 1.8% for the Kathiawaris, 1.1% for the Marwaris, and 1.5% for the Palanpuris.

for the firm to agree to be interviewed, but in other cases the firms did contact the individual who had provided the referral to verify its authenticity. Although it is well known that community networks play an important role in this industry, the survey respondents were generally reluctant to report the support that they received from members of their community or from other close connections in the diamond industry. The pattern of referrals that was received evidently had research value since it could be used to provide direct evidence on the importance of community ties and so the survey team was instructed to continue to fill those data fields even after a firm had been interviewed.

Table 1 lists the major sources of referrals, the number of referrals that they provided, and the community-wise breakdown of firms that received these referrals. We started with the largest firms in the industry and gradually moved down the firm-size distribution as we received referrals to smaller and smaller firms. Because of this non-random sequence of interviews and because the number of referrals is restricted to five per firm, we clearly do not have a representative sample of referrals. The statistics in Table 1 should be treated with caution, but the cross-community referral patterns reported below are nevertheless indicative of the important role that social ties play in this industry. A total of 295 individuals provided referrals; 72% were exporters belonging to the three main communities, 16% were brokers, and the remaining 12% were exporters from other communities and individuals outside the industry who had social connections with particular exporters. A total of 1,473 referrals were provided by these sources; 76% from the exporters, 16% from the brokers, and 8% from other sources. Although the three communities are represented roughly in proportion to their share in the population of export firms in Column 1, Marwaris are over-represented, while Kathiawaris are under-represented in terms of their share of the total referrals provided in Column 2.

Looking across Columns 3-5 it is apparent that exporters from each community disproportionately provide referrals to members of their own group. Given that Kathiawaris make up just 29% of all firms, it is quite striking that 74% of the referrals from Kathiawari exporters are to members of their community. Marwaris and Palanpuris also favor members of their own community, but the Marwaris in particular make a substantial number of cross-community referrals. We will see that the Marwaris concentrate on the polished side of the market where community affiliation is less important, which explains why the Marwari exporters appear to maintain connections across all communities. In contrast with the pattern of referrals made by the exporters, the distribution of referrals made by brokers – who belong to different communities and must interact with firms of all communities – generally matches the composition of firms, by community, in the industry.

3 The Diamond Industry Today

3.1 Characteristics of Firms

The history of the industry described earlier would suggest that exporters from the three communities should come from very different backgrounds. The descriptive statistics in Table 2, based now on the survey data collected from the senior partner in each firm, indicate that this is indeed the case.

The entrepreneur's age is (mechanically) negatively correlated with the year that the firm was established. Not surprisingly, the Kathiawari respondents are younger than the Marwari respondents, who in turn are younger than the Palanpuri respondents in our sample. The Kathiawaris also have significantly lower educational attainment, measured by years of schooling, than the entrepreneurs from the more established business communities. One important schooling decision that parents must make in India is whether to send the children to secondary school in English or the local language (university education is almost always in English, at least in the major metropolitan areas). Munshi and Rosenzweig (2006) describe how this choice has important implications for the children's future; in the diamond industry, fluency in English and the westernization that goes with English schooling allow entrepreneurs to make contact and establish personal relationships more easily with foreign buyers and suppliers. The Kathiawaris are less likely to have been schooled in English than the Marwaris and Palanpuris, and they are further disadvantaged by being less likely to have grown up in Bombay (as compared with the Palanpuris). This lack of urban experience is potentially a liability when it comes to establishing branches abroad and interacting with foreign buyers and suppliers. Notice that a relatively low proportion of Marwaris also report having grown up outside Bombay, but this simply reflects the wide scope of their business activities; although not reported, many of them grew up in urban centers elsewhere in the country and this will become apparent in a moment when we describe the occupations of their fathers.

Table 2, Panel B describes the entrepreneur's father's occupation, which is aggregated into seven categories: farming, white-collar professional, other business, other jewelry business, diamond cutting and polishing, diamond broker or trader, and diamond exporting. The most striking observation from these statistics is that 53% of the Kathiawaris, but just over 2% of the Marwaris and Palanpuris, report that their fathers were farmers. Looking down the other occupational categories, the Kathiawaris are significantly less likely to belong to a business family than the other two communities. It is this transition, from farming to international business, despite the disadvantages that the Kathiawaris

face in terms of education, language skills, and social background, that we will try to understand in this paper.

The basic marriage rule in Hindu society is that no individual can match outside the sub-caste or *jati*. The dense web of marriage ties that consequently forms over the course of many generations improves information flows and reduces enforcement problems, and not surprisingly networks serving different functions have historically been organized at the level of the *jati*. Marriage outside the *jati* is rare in India, in large part due to the continuing role that caste networks play in facilitating economic activity. Consistent with this general trend, over 90% of the entrepreneurs in the sample married within their *jati*.

"For the business family more may be required of marriage than just *jati* endogamy ... Access to credit and avenues for mobility are dependent upon the complex network of relationships arising from marriage" (Hazlehurst 1966: 45, 109). The diamond industry is no exception to this pattern and each year a large number of marriages take place with great fanfare between November and January, creating alliances between diamond firms. Marriage within the industry reduces the entrepreneur's incentive to renege on his obligations, thereby increasing his access to the network. The theoretical framework predicts that firms belonging to the community with worse outside options will have the greatest incentive to invest in such network-strengthening marriages and that the community-gap in these marriage patterns will grow over time. Although we successfully test these predictions later in Section 4, it is worth noting that the Marwaris whose networks span multiple industries are least likely to marry a woman from a diamond family in Table 2, Panel C as expected. Palanpuris are more likely to marry within the industry than Kathiawaris but we will see below that this gap declines rapidly over time.

We hypothesize that differences in business backgrounds across communities in Table 2 can be explained by compensating differences in underlying business networks. However, the Kathiawari entrepreneurs could also compensate for their limited business backgrounds by improving their individual capabilities prior to establishing their firms. Table 3 compares individual preparation for the diamond business across communities. Most entrepreneurs did nothing (were students) prior to entering the diamond industry, in Panel A, although the Marwaris are significantly more likely to have been in some other business. Nine percent of the Kathiawaris actually moved from farming to the diamond business in the current generation, and looking down the rows in the panel they are generally less likely to have prior preparation in business than the other communities.

The same pattern is observed in Panel B, which describes the entrepreneur's activities in the diamond industry prior to entering the current firm. The Kathiawaris are less likely to have been partners in another firm, consistent with the statistics reported later indicating that Kathiawari firms are less likely to break up. They are also less likely to have been engaged in activities such as brokerage or trading, which would have provided good preparation for their current business. Combining the last four categories in Panel B, the Kathiawaris have significantly less diamond-specific business preparation than either the Marwaris or the Palanpuris. Instead, they are more likely to have been laborers, cutting and polishing diamonds, or contractors. The cross-community patterns in Table 3 do not vary with establishment year (not reported) and in general I find no evidence that the Kathiawaris are preparing themselves prior to entry to compensate for their weak business backgrounds.

Do these community differences persist across generations? Table 4, Panels A and B, compare characteristics of the children, their spouses, and the marriage choices made for them, separately by gender and community. The Kathiawaris continue to lag behind the established communities in educational attainment and the likelihood of being schooled in English, but notice that the community-gap has narrowed in Table 4, Panel A as compared with the corresponding statistics for the previous generation, reported earlier in Table 2, Panel A. The sons of the respondents who have completed school are almost without exception absorbed into the diamond industry, whereas almost none of the daughters work outside the home. The corresponding statistics for the spouses of the (married) children in Table 4, Panel B broadly match these occupational patterns, except that a significant proportion of the daughters marry white-collar professionals or businessmen in other industries. Notice that one-third of the Marwari daughters are married to businessmen operating outside the diamond industry, consistent with the idea that many outside opportunities are available for members of that community. Along the same lines, just 16% of the daughter-in-laws and 37% of the son-in-laws of the Marwari respondents come from families that were already in the diamond business prior to marriage. These numbers are significantly lower than the corresponding statistics for the Kathiawaris and Palanpuris. However, children from all three communities continue to marry within their *jatis*, highlighting their continued ties to the broader community networks.

The sons of the Kathiawari entrepreneurs are not disadvantaged, as their fathers were, by the lack of a business background. One reason why less capable Kathiawari entrepreneurs might have chosen to enter the business in the current generation is that they are preparing the way for their sons in the future. A related explanation is that since they have worse outside options in any case, they do not

mind faring worse than their Marwari and Palanpuri competitors in the diamond industry. However, the statistics reported in Table 5, Panel A indicate that the Kathiawaris do not, in fact, perform worse than the businessmen from other communities, reinforcing the view that they must be advantaged along some other dimension.

Diamond cutting and polishing is a labor intensive activity that does not require great skill. Firms in the industry employ the same production technology, with a single worker assigned to a single machine, and so must increase their production by hiring more workers. With constant returns to scale in production, the firm's profit, which is not observed, is a linear function of its sales or exports. Citing confidentiality concerns, the GJEPC did not release firm-level export figures when it provided its database to be used as the sampling frame for the survey in 2004. However, it reversed its decision in 2005 once the survey had been completed and I had established more credibility in the industry. I was provided with export data over the 1995-2004 period, which can be matched to the 95% of firms in the sample that appear in the database. To mask firm-specific figures, the firms in the database were sorted by export level and then divided into 100 groups in each year by the GJEPC. The average export level in a group was then assigned to all firms in that group. While this procedure generates some noise in the export data, it does not affect the cross-community comparisons reported in Table 5, Panel A or bias the estimated community coefficients in the export regressions that I describe later in the paper. Export levels are comparable across communities in the 1995-1999 period as well as in the 2000-2004 period in Table 5. The Kathiawaris keep up with the Palanpuris and, if anything, it is the Marwaris who fall behind. Exports are reported in 1994 Rupees and the exchange rate was roughly 25 Rupees to the dollar at that time. This implies that the firms in the sample had average annual sales of $4-5 million in the 1995-1999 period, which increased to $6-7 million in the 2000-2004 period.[8] Even with low margins of around 5 percent, this still works out to substantial annual profits per firm by Indian standards. For the Kathiawaris in particular, these statistics are indicative of a remarkable transformation in their fortunes over a single generation.

3.2 Organization of the Diamond Business

"Much of the diamond industry revolves around the issue of getting a regular supply of good quality [rough] diamonds" (Engelshoven 1999: 371). Rough suppliers in Antwerp and the largest exporters

[8]Total Indian diamond exports were roughly seven billion dollars at this time, which is consistent with our estimate that about one thousand firms are currently active in the market.

receive parcels directly from the Diamond Trading Corporation (DTC), the trading arm of DeBeers, or from other primary suppliers of rough diamonds. These parcels will typically comprise stones of various grades and sizes. Individual exporters, however, will tend to specialize in stones of a particular size, which implies that they must approach different suppliers in Antwerp from one trip to the next.[9] The exporters receive these roughs on credit, without providing security or signing a written contact. Without the ability to establish a long-term relationship with a single supplier, the commitment problems that could consequently arise are substantial. The suppliers would also like to do business with capable exporters, who can have the roughs cut and polished quickly and then sold at a good price, allowing them to repay their loans within the stipulated period with relative certainty. This is where the community network comes in: Firms that have established close ties with a particular supplier provide referrals for other members of their community. The firms providing the referrals have supplier-specific reputations, and presumably the rents that go with them, at stake and so they have the right incentive to refer only the most able firms and to ensure that those firms do not renege on their obligations. Firms will typically draw upon different members of their community to provide referrals from one trip to the next, and so a multilateral punishment strategy of the sort described by Greif (1993), in which no firm provides referrals to an entrepreneur who has deviated in the past in equilibrium, must be in place to maintain cooperative behavior.[10]

Table 5, Panel B describes transactions on the rough side of the market, while Panel C describes transactions on the polished side. We see in Panel B that firms have 10-12 suppliers per year and that 70% of the firms have a dominant supplier who provides more than 30% of their roughs. Different firms will have different dominant suppliers, allowing for cross-referrals across firms as described above. Much of the rough supply (around 70%) comes from Antwerp. The other major alternative source of roughs is the Bombay secondary market, where the price is substantially higher but the commitment

[9]Diamonds are classified by size and shape. In the questionnaire we defined eight categories – seven sizes and a separate category for "fancy shapes" – and asked the entrepreneurs to report the proportion of their output (by value) in each category. Despite this fine classification of stones, a substantial fraction of the firm's output is devoted to a single – most popular – category: 52% for the Kathiawaris, 42% for the Marwaris, and 48% for the Palanpuris. The Marwaris are significantly less specialized, in large part because their business is centered on the polished side of the market, where flexibility is less costly.

[10]Suppose that a limited number of exporters are in a position to provide a fixed number of referrals in each period. If one of those exporters deviates from the equilibrium and provides a referral to someone who has reneged on his obligations in the past, the previous cheater's only incentive to be honest is to maintain ties with his benefactor. In contrast, someone who has been honest in the past has an additional incentive to be honest; to receive referrals from other exporters in the future. As long as there is some probability that the deviating exporter will be unable to provide a referral in the next period, irrespective of current-period behavior, previously honest individuals will have a strictly greater incentive to honor their commitments and so will be preferred, ruling out such deviations from the cooperative equilibrium.

problems less severe since the firms have a permanent presence in the city. Notice that the Kathiawaris receive a significantly greater fraction of their roughs from Antwerp than the other two communities, consistent with the view that they have access to a stronger network.[11] Despite the high value of the rough diamonds and the potential for default, much of the rough supply is obtained on credit and rarely involves a written contract, across all three communities.

In contrast with rough diamond transactions, where referrals are critical and firms tend to do business with a limited number of suppliers, the polished side of the industry operates very much like a spot-market. Firms have as many as 30-50 buyers per year in Panel C and relatively few (around 60%) of the firms have a single dominant buyer, despite the fact that a dominant buyer is now defined to account for just 20% of the firm's product. A substantial fraction of the polished diamonds are also sold on the Bombay market, typically through brokers, either to merchant exporters or visiting foreign buyers. Notice that the Marwaris perform particularly well on the polished side of the market; they have more buyers per year, yet are more likely to report a dominant buyer (indicative of a balanced client portfolio) and to sell their polished directly abroad. This observation is consistent with the subsequent analysis, which indicates that the Marwari rough-diamond network is relatively weak and that diamond firms from this community tend to concentrate on the polished side of the market. Polished diamonds are largely sold on credit and these transactions rarely involve a written contract, so commitment problems could potentially arise on this side of the market as well, with foreign buyers reneging on their obligations. Although referrals play an important role on the rough side of the market, firms do not share polished buyers with each other according to my industry informants. Because firms tend to specialize in particular stone sizes, they can build long-term relationships with a few foreign buyers instead, channelling the rest of their output abroad through numerous merchant exporters with established clients of their own. All export firms, including the merchant exporters, have a permanent presence in Bombay and so commitment problems between local firms naturally tend to be less severe on the polished side of the market.

Information on the firm's transactions was also collected when it first started exporting. Although not reported, the patterns in Table 5 are by and large the same when the transactions statistics are computed at this earlier point in time. The number of suppliers and buyers is smaller, less than half of what we see in Table 5, but most other aspects of these transactions do not change with the firm's age

[11]The very largest firms, known as *sightholders*, receive roughs directly from the DTC. A relatively small number of firms also buy roughs from Israel. Allowing for all of these possibilities, the Kathiawaris continue to receive a greater share of their roughs from outside the Bombay market than the other communities.

or over time. The only exceptions are the proportion of roughs bought directly from Antwerp, which has declined for the Marwaris and Palanpuris relative to the Kathiawaris, and the repayment period on the polished side of the market, which was about 90 days when the firms first started exporting and has now increased to about 110 days. These two observations are consistent with a strengthening of the Kathiawari rough-network over time and an accompanying decline in profit margins with the entry of new firms. Many Marwari and Palanpuri firms have chosen to exit the rough side of the business in this competitive environment, restricting their activity to buying polished diamonds on the Bombay market, which they subsequently sell to foreign buyers with whom they have established long-term relationships. These firms, who are known in the industry as *merchant exporters*, are not included when computing the rough statistics in Table 5, Panel A and these changes in the organization of the firm, across communities, will also show up in subsequent sections where we theoretically and empirically explore changes in the industry over time.

4 Networks and New Entrepreneurs: Theoretical Framework

The theoretical framework presented in this section formalizes the negative relationship between a community's outside options and the growth of its network, once it crystallizes. This relationship is associated with testable predictions, which are successfully verified in Section 5. I make a number of simplifying assumptions when deriving the main theoretical result. The implications of relaxing these assumptions will be discussed over the course of this section and the next.

4.1 Production and Network Technology

Each firm in this industry consists of a single entrepreneur who receives rough diamonds from Antwerp on credit at the beginning of each period, has the rough diamonds cut and polished in Surat, and then sells the polished diamonds on the competitive Bombay market. His profits at the end of the period are determined by his sales net of the loan that he must repay to the rough supplier. The unit price of rough and polished diamonds is constant over time. With constant returns to scale in production, the firm's profits are a linear function of the amount of rough diamonds that it can procure, which varies across firms and over time. Each entrepreneur is characterized by an ability endowment. More able entrepreneurs are better positioned to independently establish close ties with suppliers in Antwerp and so the amount of roughs procured is increasing in ability.

The entrepreneur will also receive referrals from members of his network to rough suppliers. As

discussed above, a limited number of entrepreneurs are positioned to provide referrals in each period. This set of entrepreneurs varies from one period to the next depending on the mix of stones received by the suppliers in Antwerp. If a fixed proportion of entrepreneurs in the network provide referrals in each period and each entrepreneur provides a fixed number of referrals then it is evident that the probability of receiving a referral is independent of network size. However, the amount of roughs received on credit with each referral will be positively correlated with network size if larger networks can sustain higher levels of cooperation. We assumed above that the only cost that an entrepreneur incurred by defaulting on his loan was exclusion from the network and the referrals it provided. In practice a deviator could also lose access to the suppliers that his network is connected with and this loss would be increasing in network size under the reasonable assumption that larger networks interact with more suppliers. With larger sanctions, higher levels of credit can be sustained without default, increasing the level of production and hence the profits of firms in larger networks.

4.2 Selection into the Industry

4.2.1 The Entry Condition

Profits inside the diamond industry are increasing in the entrepreneur's ability and the size of the network, as described above. Assume that individuals do not provide referrals in the first period that they enter. Subsequently they contribute to the network but do not (fully) internalize the value of the service they provide. The first assumption reflects the idea that entrepreneurs must be established before they can provide referrals. The second assumption is consistent with the observation that social sanctions must often be imposed to encourage participation in collective institutions.

Each community consists of a continuum of individuals, with an ability distribution characterized by the function $F(\omega)$. We will see below that there exists a threshold ability level in any community at each point in time above which all individuals enter the diamond industry. Based on the assumptions above, the effective size of community j's network for entrants in period t is $1 - F(\omega_{t-1}^j)$, the measure of the community already in the network in the previous period, where ω_{t-1}^j is the threshold ability in that period. The payoff inside the diamond industry for individual i belonging to community j in period t is then $G(1 - F(\omega_{t-1}^j)) + r_I \omega_i^j$, where the function G, with $G' > 0$, characterizes the network technology, mapping network size into individual payoffs in that period, ω_i^j is the individual's ability, and r_I measures the returns to ability inside the industry.[12]

[12]By specifying that all individuals inside the industry receive the same payoff from their network we implicitly ignore

Individuals belong to two communities, the H-community and the L-community, which are distinguished only by the quality of the options available to their members outside the diamond industry. In practice, the L-community refers to the Kathiawaris while the H-community includes the more established Marwaris and Palanpuris. The payoff outside the diamond industry for individual i from community j in any period is described by the expression $u^j + r_O\omega_i^j$, where u^j is a community-specific term, $u^L < u^H$, and r_O measures the returns to ability outside the industry. The diamond industry is an industry in which an individual with initiative and resourcefulness can do exceptionally well and so it seems reasonable to assume that $r_I > r_O$.

With free entry and exit, the present value from remaining outside and inside the industry for individual i in period t is given by the expressions

$$V_{it}^{jO} = u^j + r_O\omega_i^j + \delta max(V_{it+1}^{jO}, V_{it+1}^{jI})$$

$$V_{it}^{jI} = G(1 - F(\omega_{t-1}^j)) + r_I\omega_i^j + \delta max(V_{it+1}^{jO}, V_{it+1}^{jI}),$$

where V_i^{jO}, V_i^{jI} are the respective value functions outside and inside the industry and $\delta \in [0, 1)$ is a discount factor. The infinitely lived individual's period-t decision has no effect on the continuation value of his subsequent payoffs and it is apparent from the expressions above that his entry decision will depend on current payoffs alone. In general, there exists a threshold ability ω_t^j in each period t satisfying the condition:

$$u^j + r_O\omega_t^j = G(1 - F(\omega_{t-1}^j)) + r_I\omega_t^j. \tag{1}$$

Entrepreneurs with $\omega_i \in [\omega_t^j, \omega_{t-1}^j)$ will enter the industry and entrepreneurs with $\omega_i < \omega_t^j$ will stay outside. We will see below that each community's network grows steadily in size over time. Although we allow for free entry and exit, this implies that no entrepreneur who has chosen to enter the industry will subsequently exit, because the payoff inside the industry will be strictly greater than the payoff outside the industry for him in all future periods.

4.2.2 Growth of the Network

To characterize the network dynamics, assume that all individuals with ability above ω_0 are exogenously moved into the industry, in both communities, in period 0. From the equation above,

the rents that established members receive by providing referrals. This assumption simplifies the analysis without qualitatively changing the results.

$$\omega_1^j = \frac{u^j - G(1 - F(\omega_0))}{r_I - r_O}. \tag{2}$$

Because $u^L < u^H$, it follows immediately that $\omega_1^L < \omega_1^H$; there is greater entry in the L-community in period 1. Solving recursively, it is easy to verify that $\omega_t^L < \omega_t^H$, $\forall\ t$; firms belonging to the L-community will have lower marginal ability and, hence, average ability at each point in time.

The result that average ability is lower in the L-community at each point in time is consistent with the comparison across communities reported in Table 2. Although this result is a consequence of the larger (stronger) network in that community, supporting greater entry at the margin, alternative non-network explanations are also available. It is apparent from equation (1) and equation (2) that we would obtain $\omega_t^L < \omega_t^H$ even if networks were absent because $u^L < u^H$. To provide additional support for the claim that stronger networks in the L-community allow firms with lower ability to enter, we proceed to derive the more stringent result that the L-community network should actually be growing more rapidly than the H-network at each point in time. We will see that this result is associated with predictions that have greater bite against alternative non-network explanations.

From equation (2), the change in the ability threshold from period 0 to period 1 within any community j is given by,

$$\omega_0 - \omega_1^j = \omega_0 - \frac{u^j - G(1 - F(\omega_0))}{r_I - r_O}. \tag{3}$$

The first condition that needs to be satisfied is that the network should be growing in size: $\omega_0 - \omega_1^j > 0$. This requires that the right hand side of equation (3) must be positive, which will be the case if the measure of initial entrants ω_0 is sufficiently large. If this condition is satisfied, it is easy to verify from the expressions that follow that the network will continue to grow steadily thereafter. The second condition that needs to be satisfied is that the L-network should be growing more rapidly than the H-network at each point in time. It follows from the expression above that $\omega_0 - \omega_1^L > \omega_0 - \omega_1^H$, since $u_L < u_H$; the marginal entrant's ability declines more steeply in the L-community in the first period. $\omega_1^L < \omega_1^H$ implies $F(\omega_1^L) < F(\omega_1^H)$, which implies, in turn, that $F(\omega_0) - F(\omega_1^L) > F(\omega_0) - F(\omega_1^H)$; the network grows stronger in the L-community in the first period. This condition, however, will be more difficult to satisfy in subsequent periods.

Using equation (2) once again, the change in marginal ability from period 1 to period 2 is given by

$$\omega_1^j - \omega_2^j = \frac{G(1 - F(\omega_1^j)) - G(1 - F(\omega_0))}{r_I - r_O}. \tag{4}$$

Since $\omega_1^L < \omega_1^H < \omega_0$, it follows that $\omega_1^L - \omega_2^L > \omega_1^H - \omega_2^H > 0$; the marginal entrant's ability declines more steeply in the L-community in the second period. However, the mapping from ability to network size is not as straightforward as it was in the first period. Because changes in ability are occurring further down the ability distribution in the L-community, we need the additional condition that the density $F'(\omega)$ should be non-decreasing as we move down the distribution to establish that $F(\omega_1^L) - F(\omega_2^L) > F(\omega_1^H) - F(\omega_2^H)$.

From the next period onwards even the comparison of the ability-decline across communities is no longer straightforward. From equation (4),

$$\omega_2^j - \omega_3^j = \frac{G(1 - F(\omega_2^j)) - G(1 - F(\omega_1^j))}{r_I - r_O}.$$

We know that $\omega_1^L - \omega_2^L > \omega_1^H - \omega_2^H$, but the effect of this larger ability-gap in the L-community on $\omega_2^j - \omega_3^j$ will depend, in general, on the ability distribution (F) and the network technology (G). To characterize conditions under which $\omega_2^L - \omega_3^L > \omega_2^H - \omega_3^H$, take a first-order Taylor expansion around $\omega_1^j = \omega_2^j$ to obtain

$$\omega_2^j - \omega_3^j \approx \frac{G'(1 - F(\omega_1^j))F'(\omega_1^j)(\omega_1^j - \omega_2^j)}{r_I - r_O}.$$

Because $\omega_1^L - \omega_2^L > \omega_1^H - \omega_2^H > 0$, $F'(\omega_1^L) > F'(\omega_1^H)$ and $G'(1 - F(\omega_1^L)) > G'(1 - F(\omega_1^H))$ are sufficient to ensure that $\omega_2^L - \omega_3^L > \omega_2^H - \omega_3^H > 0$. We have already shown that $\omega_1^L < \omega_1^H$ and so the first condition will be satisfied under the maintained assumption that the density $F'(\omega)$ is non-decreasing as we move down the ability distribution. Since we are starting from the very top of the distribution and moving down, this would seem to be a reasonable assumption and we will later verify that the marginal entrant's ability indeed declines as the network matures. I argued above that larger networks are more effective in maintaining cooperative behavior because they can use their influence within the industry to impose harsher punishments. If individual firms independently establish close ties with suppliers, the network's coverage will increase at an approximately linear rate, at least to begin with. As the network matures, the number of members with ties to the same supplier will increase as well, providing an additional dimension along which network influence grows over time. We thus expect that the second condition will be satisfied under reasonable conditions. As before,

$\omega_2^L - \omega_3^L > \omega_2^H - \omega_3^H$ implies $F(\omega_2^L) - F(\omega_3^L) > F(\omega_2^H) - F(\omega_3^H)$ if $F'(\omega)$ is non-decreasing. Solving recursively, the same conditions on the ability distribution and the network technology imply that $F(\omega_{t-1}^L) - F(\omega_t^L) > F(\omega_{t-1}^H) - F(\omega_t^H)$, $\forall\ t$; the network grows more rapidly in the L-community with worse outside options at each point in time.

4.2.3 Firm Characteristics and Performance

Apart from changes in the number of firms, the theoretical framework also generates predictions for changes in the average ability of entering firms across communities and over time. To derive these predictions it will be useful to assume that ability is uniformally distributed over the unit interval and that the network technology is linear. Notice that these assumptions are just sufficient to ensure that the L-community network grows faster than the H-community network at each point in time. Equation (1) can then be rewritten as

$$\omega_t^j = \frac{u^j - g(1 - \omega_{t-1}^j)}{r_I - r_O} \equiv \alpha^j + \beta\omega_{t-1}^j.$$

Starting with the first period and moving forward in time we solve recursively to obtain

$$\omega_t^j = \frac{\alpha^j}{1-\beta} + \left(\omega_0 - \frac{\alpha^j}{1-\beta}\right)\beta^t. \tag{5}$$

Treating time as a continuous variable and placing the following restrictions on the parameter values, $\beta \in (0,1)$ and $\omega_0 - \frac{\alpha^j}{1-\beta} > 0$, we replicate the results derived more generally above, noting that α^j is increasing in u^j:[13]

$$\frac{d\omega_t^j}{dt} = \left(\omega_0 - \frac{\alpha^j}{1-\beta}\right)\beta^t ln\beta < 0$$

$$\frac{d^2\omega_t^j}{d\alpha^j dt} = \frac{-\beta^t}{1-\beta} ln\beta > 0.$$

The preceding results apply to the marginal entrant in each period. To obtain the corresponding results for the average entrant with ability W_t^j we take advantage of the assumption that the ability distribution is uniform: $W_t^j = \frac{\omega_{t-1}^j + \omega_t^j}{2}$.

[13]These restrictions on the parameters are analogous to the condition that the right hand side of equation (3) should be positive. Recall that a large ω_0 was sufficient to satisfy this condition. However, additional restrictions are required once ability is specified to be uniformally distributed on the unit interval. With this distributional assumption, it is also apparent that our results only apply to periods prior to the time that the individual with zero ability in the L-community enters the diamond industry.

Placing the same restrictions on the parameters as above, the selection patterns that we derived for the marginal entrant follow through for the average entrant as well:

$$\frac{dW_t^j}{dt} = \left(\omega_0 - \frac{\alpha^j}{1-\beta}\right)\beta^t ln\beta \left(\frac{1+\beta}{2\beta}\right) < 0$$

$$\frac{d^2W_t^j}{d\alpha^j dt} = \frac{-\beta^t}{1-\beta} ln\beta \left(\frac{1+\beta}{2\beta}\right) > 0.$$

Earlier, we showed that ω_t^j, ω_{t-1}^j, which cover the range of abilities for entrants in period t, should shift down faster in the L-community than in the H-community, without placing strong parametric restrictions on the network technology or the ability distribution. The assumption that the ability distribution is uniform allows us to derive the same result for the average entrant, with ability $(\omega_{t-1}^j + \omega_t^j)/2$. For the more general case with a non-decreasing density as we move down the ability distribution, the average entrant would lie increasingly closer to ω_t^j than to ω_{t-1}^j in the L-community with greater entry, reinforcing the result obtained with the uniform distribution.

We interpret a relatively rapid decline in the average entrant's ability in the L-community as a response to the rapidly growing strength of his network. However, these changes in ability would also be observed if we relaxed the assumption that the outside options were constant over time; by allowing u^L to decline more rapidly than u^H. To rule this out, we proceed to derive predictions from our network-based model for changes in firm performance (sales) across communities and over time.

Recall that firm i's performance inside the diamond industry is characterized by the expression: $G(1 - F(\omega_{t-1}^j)) + r_I\omega_i$. Based on the patterns of entry just derived, the first term in this expression should be increasing more rapidly over time in the L-community when networks are active, under reasonable conditions. To test this prediction we take advantage of the fact that export data are available at the firm level over multiple years. Net of firm fixed effects, which will control for compositional changes in the industry over time, firm performance should then increase more rapidly in the L-community. The alternative explanation for changes in the characteristics of entrants over time, based on changes in outside options, makes no prediction for changes in firm performance once fixed effects are included.

4.2.4 Alternative Distributional Assumptions

Up to this point we have assumed that individuals belong to a single cohort. In practice, multiple cohorts would have entered the diamond industry over the past four decades. To derive patterns of entry

with the multiple-cohort case that can be compared with the single-cohort case it will be convenient to assume: (i) the ability distribution does not vary across cohorts and continues to be characterized by $F(\omega)$ in each community, (ii) individuals enter the industry at a fixed age, and (iii) they receive referrals from the cohort that preceded them. With these assumptions, it is straightforward to verify that the marginal entrant's ability in each period is the same as it was with a single cohort. The important difference is that entrants in period t are now drawn from $\omega_i \in [\omega_t, 1]$ rather than $\omega_i \in [\omega_t, \omega_{t-1})$. The average entrant's ability is then described by the expression $\tilde{W}_t^j = \frac{1+\omega_t^j}{2}$. Assuming that the ability distribution is uniform and that the network technology is linear, and placing the same restrictions on the parameters as before, $\frac{d\tilde{W}_t^j}{dt} < 0$, $\frac{d^2\tilde{W}_t^j}{d\alpha^j dt} > 0$.

Although the main predictions continue to hold with multiple cohorts, it is straightforward to verify that the decline in ability over time is shallower than it was with a single cohort for $\beta > 0$. The intuition is that the average entrant's ability can continue to decline relatively slowly over many periods when the pool of potential entrants is continually refreshed by younger cohorts. It is more difficult to compare the single-cohort and multiple-cohort cases when we allow all previous cohorts to provide referrals, but the basic argument outlined above should still hold and we will later see that the average entrant's ability declines steadily over a thirty-year period in our data.

The model generates predictions for changes in firm characteristics and performance, across communities, based on differences in outside options alone. Suppose, instead, that the ability distribution varies across communities but the outside options are the same. Would we still expect the L-community to show a steeper decline in the average entrant's ability over time?

Since the H-community has greater business experience, we might expect that the ability distribution in that community will lie to the right of the distribution in the L-community. Equivalently, we might expect the H-community to be characterized by a thicker tail at the top of the ability distribution. Assuming as before that all individuals with ability above ω_0 are moved into the network in period 0, the size of the network will be larger in the H-community in the initial period. Setting $u^L = u^H$, it follows from equation (2) that $\omega_1^L > \omega_1^H$ and, solving recursively, that $\omega_t^L > \omega_t^H$, $\forall\ t$. Using the argument outlined above, it follows that $\omega_{t-1}^L - \omega_t^L < \omega_{t-1}^H - \omega_t^H$, $\forall\ t$, as long as the density is non-decreasing as we move down the ability distribution in each community and the G function is linear or convex. Holding outside options the same across communities, the marginal entrant's ability would actually decline more steeply over time or across cohorts in the more established H-community, contradicting the empirical patterns that we will later observe. It must be that differences in outside

options $u^L < u^H$ are large enough to compensate for any opposing effect due to differences in ability across communities.[14]

4.3 Selection into the Network

Up to this point we have assumed that all individuals that enter the industry benefit from the network and contribute to it once they are established. The implicit assumption is that the threat of punishment by members of the network is sufficient to deter deviations from cooperative behavior. In practice, we might expect individuals to make investments in the network that make it more costly for them to deviate in the future, increasing the level of cooperation that can be sustained in equilibrium. One example of such an investment is marriage within the industry; an entrepreneur who has married in this fashion risks his own reputation as well as the reputation of his wife's family when he reneges on his business obligations. Although individuals can choose the level of participation in the network that is optimal for them in practice, we assume for simplicity that they can either invest in the network or not, once they enter the industry, in the discussion that follows. Only those individuals who have invested contribute to the network and benefit from it.

If we think of investment in the network as marriage within the industry, then this is a choice that the individual can make once only. It will thus be convenient to consider the case with multiple cohorts, which is equivalent to the single-cohort case when the individual receives referrals from the cohort that preceded him. We will see that there exists an ability threshold above which individuals enter the diamond industry, as before. In addition, there will exist an ability threshold above which individuals inside the industry select out of the network. Payoffs inside the diamond industry are described by the expression:

$$X_i^j \cdot g\left[\overline{\omega}_{t-1}^j - \underline{\omega}_{t-1}^j\right] + r_I \omega_i^j - X_i^j p \omega_i^j,$$

where X_i^j equals one if individual i from community j who has chosen to enter the industry also invests in the network, X_i^j equals zero if he does not. $\underline{\omega}_{t-1}^j$ is the ability threshold above which individuals entered the industry in the preceding cohort and $\overline{\omega}_{t-1}^j$ is the threshold above which they selected out of the network. Assuming that ability is uniformally distributed on the unit interval, the measure of the network in period t is $\Delta\omega_{t-1}^j \equiv \overline{\omega}_{t-1}^j - \underline{\omega}_{t-1}^j$. The mapping from network size to individual payoffs is linear, measured by the g term as usual. The cost of investing in the network, p, is assumed to be

[14]Note that differences in the ability distribution across communities will have no impact on the ability of the marginal entrant at each point in time, although the rate of entry of firms might differ, when networks are absent.

increasing in the individual's ability. The motivation for this assumption is that capable individuals are more likely to have opportunities outside the diamond industry and so industry-specific investments are more costly for them. It is this assumption that drives the selection by ability out of the network that we derive below.

Using the preceding expression for payoffs inside the diamond industry, individual i in community j will invest in the network (conditional on having entered the industry) if:

$$g\Delta\omega_{t-1}^{j} - p\omega_{i}^{j} \geq 0.$$

Using the same expression for payoffs outside the industry as before and noting that the marginal individual who enters the industry also invests in the network, individual i in community j will enter the industry (and invest in the network) if:

$$g\Delta\omega_{t-1}^{j} + (r_I - p)\omega_{i}^{j} \geq u^{j} + r_O\omega_{i}^{j}.$$

Based on the entry conditions derived above, the thresholds for selection out of the network and selection into the industry can be expressed as:

$$\overline{\omega}_{t}^{j} = \frac{g\Delta\omega_{t-1}^{j}}{p} \tag{6}$$

$$\underline{\omega}_{t}^{j} = \frac{u^{j} - g\Delta\omega_{t-1}^{j}}{r_I - r_O - p}. \tag{7}$$

Entrepreneurs with $\omega_i \in [0, \underline{\omega}_t^j)$ stay out of the industry, entrepreneurs with $\omega_i \in [\underline{\omega}_t^j, \overline{\omega}_t^j]$ enter the industry and select into the network, and entrepreneurs with $\omega_i \in (\overline{\omega}_t^j, 1]$ enter the industry but select out of the network. Subtracting the expression for $\underline{\omega}_t^j$ in equation (7) from the expression for $\overline{\omega}_t^j$ in equation (6),

$$\Delta\omega_{t}^{j} = \frac{-pu^{j} + (r_I - r_O)g\Delta\omega_{t-1}^{j}}{p(r_I - r_O - p)} \equiv -\tilde{\alpha}^{j} + \tilde{\beta}\Delta\omega_{t-1}^{j}.$$

Assume that a measure $\Delta\omega_0$ of firms is exogenously entered into the network in both communities in period 0. Moving forward in time and solving recursively, we obtain an expression analogous to equation (5),

$$\Delta\omega_{t}^{j} = \frac{\tilde{\alpha}^{j}}{\tilde{\beta} - 1} + \left(\Delta\omega_0 - \frac{\tilde{\alpha}^{j}}{\tilde{\beta} - 1}\right)\tilde{\beta}^{t}. \tag{8}$$

Once again we need to assume that $\Delta\omega_0$ is sufficiently large, $\Delta\omega_0 - \frac{\tilde{\alpha}^j}{\tilde{\beta}-1} > 0$ with $\tilde{\beta} > 1$, to set the network on a positive trajectory from period 1 onwards. It then follows that the measure of network firms will grow over time (across cohorts) at an increasing rate. The marginal increase will also be steeper in the L-community, which implies that the gap in network size across communities should widen over time:[15]

$$\frac{d\Delta\omega_t^j}{dt} = \left(\Delta\omega_0 - \frac{\tilde{\alpha}^j}{\tilde{\beta}-1}\right)\tilde{\beta}^t ln\tilde{\beta} > 0$$

$$\frac{d^2\Delta\omega_t^j}{d\tilde{\alpha}^j dt} = \frac{-\tilde{\beta}^t}{\tilde{\beta}-1} ln\tilde{\beta} < 0.$$

By allowing firms to select into the network we can also characterize the relationship between networks and the organization of production in the market. Most firms periodically make short trips to Antwerp and so must rely on their networks for much of their rough supply. Other firms have vertically integrated by establishing branches in Antwerp. This permanent presence in the Antwerp market allows them to source roughs directly, without relying on their networks. The ability of the network to punish these firms is consequently limited and they would have restricted access to the network in any case. Finally, merchant exporters restrict their activity to buying and selling polished diamonds and so would have little use for the network's services. Placing vertically integrated firms and merchant exporters outside the network, we can derive changes in the organization of firms across communities and over time by studying changes in $\overline{\omega}_t^j$. Substituting from equation (8) in equation (6), it is straightforward to verify that $d\overline{\omega}_t^j/dt > 0$, $d^2\overline{\omega}_t^j/d\tilde{\alpha}^j dt < 0$ if $\tilde{\beta} > 1$. The measure of non-network firms entering in each cohort is $(1 - \overline{\omega}_t^j)$. With infinitely-lived entrepreneurs, $d\overline{\omega}_t^j/dt > 0$ implies that the measure of non-network firms is increasing over time but decreasing in size at the margin. The marginal decline is smaller in the H-community since $d^2\overline{\omega}_t^j/d\tilde{\alpha}^j dt < 0$, which implies in turn that gap in the number of non-network firms should be widening over time.[16]

Although the augmented model that allows for selection within the industry generates additional network-specific predictions, measured by marriage within the industry and changes in the organization of firms, note that the predictions for firms characteristics and performance derived earlier continue

[15] $\tilde{\beta} > 1$ implies that $r_I - r_O - p > 0$. It then follows that u^j and $\tilde{\alpha}^j$ have the same sign.

[16] Substituting from equation (8) in equation (7), we could go through a similar exercise for $\underline{\omega}_t^j$ to demonstrate that $d\underline{\omega}_t^j/dt < 0$, $d^2\underline{\omega}_t^j/d\tilde{\alpha}^j dt > 0$. The measure of new firms entering the industry in each cohort is given by $(1 - \underline{\omega}_t^j)$ and so these results imply that although the total number of new firms entering the industry will be increasing at the margin. The number of firms continues to grow relatively rapidly in the L-community, as shown earlier, since $d^2\underline{\omega}_t^j/d\tilde{\alpha}^j dt > 0$. However, the community-gap will be wider if attention is restricted to the network firms on account of the differential selection out of the network documented above.

to hold. The ability of the average entrant into the industry is $(\underline{\omega}_t^j + 1)/2$. Substituting from equation (8) in equation (7), it is straightforward to verify that average ability is declining over time, but less rapidly in the H-community. The same result is obtained when we restrict attention to network firms, with average ability $(\underline{\omega}_t^j + \overline{\omega}_t^j)/2$, under the additional assumption that $r_I - r_O - 2p < 0$. The payoff for firms inside the network is described by the expression: $g\Delta\omega_{t-1}^j + (r_I - p)\omega_i^j$. Controlling for compositional changes in the network over time with firm fixed effects, the results that we derived earlier $d\Delta\omega_t^j/dt > 0$, $d^2\Delta\omega_t^j/d\tilde{\alpha}^j dt < 0$ imply that firm performance will continue to grow relatively rapidly over time in the L-community.

5 Networks and New Entrepreneurs: Empirical Results

5.1 Changes in Firm Characteristics

The theoretical framework predicts that the network should grow relatively strong over time in the L-community, resulting in a relatively rapid decline in ability among entering entrepreneurs in that community. To test this prediction I will estimate the following regression:

$$\omega_i^j = \alpha EY_i + \beta EY_i \cdot L^j + \delta_j + \epsilon_i^j \tag{9}$$

where ω_i^j measures the ability of entrepreneur i belonging to community j, EY_i is the year in which his firm was established, L^j equals one if he belongs to the L-community and zero if he belongs to the H-community, δ_j is a community dummy, and ϵ_i^j is a mean-zero disturbance term. Under the assumptions of the model, $\alpha < 0$ and $\beta < 0$.

The L-community consists of the Kathiawaris, while the H-community includes both the Palanpuris and the Marwaris. All three communities will be included in the regression, with the Palanpuris treated as the reference category. The predictions described above thus apply to the Kathiawaris. Once we relax the assumption that rough and polished prices are constant over time, the model no longer has unambiguous predictions about the sign of the α coefficient. Changes in prices within the industry are equivalent to changes in outside options in terms of their effect on entry behavior and it is evident that the sign of dW_t^j/dt is ambiguous once we allow u^j to vary over time. More generally, the establishment year coefficient cannot be interpreted as reflecting the changing strength of the Palanpuri network alone once we allow for secular changes in payoffs within the diamond industry over time. However, the prediction $d^2W_t^j/d\alpha^j dt > 0$ continues to hold and so we continue to expect

that the establishment year-Kathiawari coefficient will be negative and significant.

Ability is measured by the father's business background or the entrepreneur's educational attainment. The dependent variable takes the value one if the entrepreneur's father was not a farmer, zero if he was in Table 6, Column 1. Non-business activities are expanded to include white-collar professional occupations and diamond cutting and polishing in Column 2. Finally, we measure ability by the entrepreneur's years of schooling in Column 3. The coefficient on the establishment year variable is negative in all three columns but only significant in Column 3. More importantly, the coefficient on the interaction of this variable with the Kathiawari dummy is negative and significant (except with schooling as the dependent variable), precisely as predicted by the model and consistent with the view that the rapidly strengthening network in that community was increasingly able to support entrants with less (inherited) business experience over time.[17] The Marwari-establishment year coefficient, in contrast, is small in magnitude and imprecisely estimated.

When deriving predictions with multiple cohorts in the previous section we assumed that the ability distribution did not vary across communities or cohorts. In practice, schooling levels have increased substantially across cohorts in our sample, particularly among the Kathiawaris. Secular changes in schooling, or ability, would have no effect on the Kathiawari-establishment year coefficient that we are most interested in but differential changes in ability across communities would affect the coefficient on the interaction term as well. By not accounting for the convergence in ability across cohorts we underestimate the relative growth in the Kathiawari network's strength over time.

If entrepreneurs establish their firms at a fixed age, as assumed in the model, then it would not be possible to control for differential changes in ability across cohorts. However, the age at establishment varies across firms in practice, and so the specifications in Columns 4-6, and all the regressions that follow in the table, include the entrepreneur's age and the age-community interaction terms as additional regressors. The Kathiawari-establishment year coefficient becomes more negative with each measure of ability, as expected, and is now significant even with schooling as the dependent variable.[18] We showed previously that the differential pattern of entry across communities applies to

[17] For firms that were formed following a separation by partners, the establishment year is measured by the year of separation. The results in Table 6 are unaffected when the establishment year is measured instead by the year in which the original firm was established or the year in which the firm started exporting.

[18] Although the age coefficients are not reported in Table 6, it is worth mentioning that the coefficient on the Kathiawari-age interaction term is negative and significant in all columns. Some of the entrepreneurs in the oldest firms inherited the business from their fathers and it follows that the age-establishment year correlation will be naturally weaker in such firms. Dropping those firms has no effect on the establishment year coefficients.

all firms in the industry as well as to network firms. Excluding vertically integrated firms and merchant exporters in Table 6, Columns 7-9, we verify that the estimates remain stable with a substantially reduced sample of network firms as well.

To demonstrate the economic importance of the cross-community effects reported in Table 6, I present nonparametric estimates of the relationship between entrepreneurial ability and the firm's establishment year (net age effects) in Figure 1.[19] Almost all entrants, regardless of their community, came from non-farming backgrounds in 1975. While this pattern remains constant over time for the Marwaris and the Palanpuris, the Kathiawari entrants are increasingly likely to have fathers who were farmers. By 1990, over 60% of the Kathiawari entrants have farming backgrounds, emphasizing the important role that their community network has played in supporting entrepreneurship.[20] One concern with our comparison across communities is that their networks were established at different points in time. If the decline in ability were weakening at the margin, then the steeper decline for the Kathiawaris could be simply a consequence of their later arrival. Notice from the figure, however, that the decline in ability is roughly linear over the entire thirty-year period starting from 1975, ruling out this explanation for our results.

5.2 Changes in Firm Performance

If outside options are declining over time and, in particular, if they are declining more steeply among the Kathiawaris, then the change in firm characteristics in Table 6 and Figure 1 could be obtained even when networks are absent. To rule out this alternative explanation we proceed to demonstrate that the performance of Kathiawari firms improves relative to other firms in the industry, once we have controlled for compositional change with firm fixed effects, reflecting the increasing relative strength of their network.

The GJEPC database provides export figures over the 1995-2004 period for most firms in the

[19]The nonparametric kernel estimates are constructed in two steps: Estimate the regression corresponding to Table 6, Column 2, separately by community, with EY-squared as an additional regressor. This allows for additional flexibility in the relationship between father's occupation and the firm's establishment year. Compute mean age by community and subtract this from each entrepreneur's age. Subtract this differenced variable, multiplied by the estimated age coefficient from the regression just described, from the dependent variable. This generates a measure of father's occupation net age effects. Then nonparametrically regress this measure on the firm's establishment year, separately by community, using the Epanechnikov kernel function.

[20]With the less inclusive business classification, among the entrepreneurs that established their firms in 1975, 90% of the Marwaris, 80% of the Palanpuris, and 70% of the Kathiawaris had fathers in business. In 1990, 70% of the Marwari and Palanpuri entrants continued to be drawn from business families versus 30% of the Kathiawaris. Schooling levels roughly match these trends in occupational background: The Marwari entrepreneurs maintain roughly 14 years of schooling, and the Palanpuris roughly 13 years of schooling, over the 1975-1990 period. The Kathiawaris start with 13 years of schooling in 1975 and fall below 11 years by 1990.

sample. Table 7, Column 1 regresses exports on a time trend, the interaction of the time trend with Kathiawari and Marwari dummies, and a full set of community dummies.[21] We see that the coefficient on the Kathiawari-year interaction term is positive but insignificant; Kathiawari exports do not lag behind Palanpuri exports despite the fact that relatively unprepared entrepreneurs from this community were entering the industry over time. The community-year effects in Column 1 reflect changes in the strength of the network as well as changes in the composition of firms over time. Controlling for compositional change with firm fixed effects in Column 2, the Kathiawari-year interaction coefficient increases in size and is now significant at the 5 percent level. The predictions for changes in firm performance apply to network firms and so Table 7, Columns 3-4 verify the robustness of these results by excluding vertically integrated firms and merchant exporters from the sample. Notice, in contrast with the positive Kathiawari-year effect, that the coefficient on the Marwari-year term is negative across all four specifications, consistent with the view that superior outside options in that community are associated with a weak network. The estimated coefficients in Columns 2 and 4 indicate that the Kathiawari network increased average sales for its members by approximately 300 thousand dollars per year over and above the Palanpuri benchmark, which reflects growth in that network as well as secular changes in the industry, effectively compensating for their increasingly weak business backgrounds. To get a sense of the importance of this differential network effect, average annual sales for Kathiawari firms were roughly six million dollars per year over the 1995-2004 period in Table 2.[22]

When a firm is involved in all stages of the production process, typically three partners, who are invariably close relatives, are required; one to buy roughs, the second to supervise the cutting and polishing, and the third to market the polished. In contrast, a merchant exporter could get by with no additional partners. Many Marwari and Palanpuri firms have restricted their activities to merchant exporting in recent years, often leading to the termination of existing partnerships. This explains, in part, why over 17% of Marwari and Palanpuri firms were formed following a separation by partners, as opposed to only 8% of the Kathiawari firms.[23] When two relatives who were partners separate, one

[21]For firms with multiple names, we took care to discard the "shell firm," which typically reports negligible exports in each year. An additional complication when computing the export figures is that polished diamonds sold to merchant exporters will not appear under the supplying firm's name. This would, if anything, underestimate export levels for the Kathiawaris and so provide a conservative estimate of the role of their network in supporting entrepreneurship.

[22]Exports are measured in millions of 1994 Rupees in Table 2 and Table 7 and the exchange rate was 25 Rupees to the dollar in that year.

[23]The Kathiawari firms have significantly more partners than firms from the other communities: The average number of partners, with standard errors in parentheses, is 2.81(0.12), 2.07(0.12), 2.22(0.07) for the Kathiawaris, Marwaris, and

individual will keep the original name while the other starts a new firm under a different name. Since suppliers and clients will be divided among the partners, both firms will be smaller than the original firm, at least to begin with. To rule out the possibility that the positive Kathiawari-year coefficient is a consequence of greater separation among Marwari and Palanpuri firms, Table 7, Columns 5-6 exclude firms that have separated or were formed following a separation from the sample. The Kathiawari-year coefficient remains stable and continues to be precisely estimated with this reduced sample of firms.

The fixed effects regressions in Table 7 rule out differential changes in outside options across communities as an explanation for the selective entry into the industry observed in Table 6. However, an alternative explanation for this selective entry, which is also consistent with changes in performance across communities and over time, is based on changing profits within the industry. Kathiawari firms tend to specialize in small stones; these stones account for 57% of their output by value, versus 44% and 49% for the Marwaris and the Palanpuris, respectively.[24] If the supply of small stones grew relatively rapidly over time, then these favorable circumstances would explain the relatively steep decline in ability among the entering Kathiawaris as well as their superior performance over time (net fixed effects), without requiring networks to be active. Small stones make up the most dynamic and competitive segment of the market and, if anything, we would expect the availability of these stones to have declined over time, relative to other sizes. Table 7, Columns 7-8 include the proportion of rough stones in the firm's output interacted with time as an additional regressor (the uninteracted variable is also included in Column 7 without fixed effects). The coefficient on this interaction term is negative and significant (in Column 8), indicating that the small-stone segment has become relatively less profitable over time, while the Kathiawari-year coefficient continues to be positive and significant once fixed effects are included.

5.3 Growth in the Number of Firms

We considered two mechanisms through which the network could strengthen in Section 4: an increase in the number of firms and an increase in network-specific investments, measured by intra-industry marriage. We will investigate each of these mechanisms, in turn, in the analysis that follows to better understand how the Kathiawari network grew relatively strong over time.

Palanpuris, respectively. Moreover, around 40% of the Marwari and Palanpuri firms are proprietary concerns versus 25% of the Kathiawari firms.

[24]We classified stones into seven sizes in the survey: -2, stars, mele, +11, pointers, stones, and larger stones. Small stones are defined to include -2, stars, and mele.

Figure 2 plots the growth in the number of firms from 1965 to 2004, based on the establishment year of each firm in the sample. Contrary to the popular view in the industry that the Kathiawaris first entered the business in the late 1970s, we see that a few Kathiawari firms were active as far back as the 1960s. The Palanpuris are always the numerically dominant group, growing at a fairly even rate over the entire 40-year period. The Marwaris and the Kathiawaris track together up till the early 1980's, but while the Marwaris continue to grow relatively slowly thereafter, the Kathiawaris grow at least as fast as the Palanpuris from 1985 onwards.

Once we allow for selection into the network, the theoretical framework predicts that the number of firms operating outside the network should be increasing relatively rapidly in the H-community. Figure 3 plots the growth in the number of merchant exporters over the 1965-2004 period. These firms start to emerge in the mid-1970's, allowing the Kathiawaris, without contacts on the polished side of the market, to enter the export business. As predicted, the merchant exporters are drawn predominantly from the Marwari and Palanpuri communities and it is apparent from the figure that the gap between the number of merchant exporters belonging to these established business communities and the Kathiawari community has grown over time. I define a merchant exporter to be a firm that has only been active on the polished side of the market, both when it started exporting and currently. A number of Palanpuris who were previously involved in all stages of the import-export process have recently reduced their activities to merchant exporting. If we accounted for the shift of such firms into merchant exporting in Figure 3, then the gap between the Kathiawaris and the other communities would widen even further over time.

Figure 4 plots the growth in the number of vertically integrated firms. A firm is defined to be vertically integrated when it establishes a branch in Antwerp and we see that the number of vertically integrated Palanpuri firms increases dramatically from the late 1970s onwards. There is a fixed cost to setting up a branch abroad – apart from the monetary expense, a close relative must also typically reside there – and so the firm will weigh the returns from procuring roughs through the community network with the returns from this substantial investment when choosing between these options. The returns to vertical integration will depend to a large extent on how easy it is for the firm to access roughs on its own, once it is established in Antwerp. The world supply of rough diamonds increased substantially in the late 1970s and the early 1980s with the opening up of Australia's Argyle mines and the release of DeBeers stockpiles in response to these competitive pressures. This exogenous increase in the rough diamond supply presumably provided the impetus for Palanpuri firms to set up

branches in Antwerp. And, as discussed earlier, these firms played an important role in the subsequent growth of the Kathiawari network. Notice that very few Marwari firms vertically integrate in Figure 4. Marwari business activities are well diversified across space and industries and although we assumed that the cost of investing in the network did not vary across communities, to highlight the role of outside options, in practice this cost will be especially high for the Marwaris. By the same argument, fixed investments in the industry, such as setting up a branch in Antwerp, are particularly costly for the Marwaris and this might explain why they concentrate on the polished side of the market.[25]

Table 8 compares changes in the number of firms, across communities, separately in the pre-1985 and post-1985 periods. A time trend, community dummies, and the time trend separately interacted with Kathiawari and Marwari community dummies are included in each regression. Starting with the total number of export firms in Columns 1-2, we see that the number of Palanpuris (the reference category) increases by about nine firms per year in both the pre-1985 and post-1985 periods. The growth in the number of Kathiawari and Marwari firms is significantly slower in the pre-1985 period (around two firms per year). While the Marwaris continue to grow more slowly than the Palanpuris in the post-1985 period, notice that the Kathiawaris grow significantly faster than the Palanpuris in this latter period, although these differences are not visually discernable in Figure 2.

Columns 3-4 and Columns 5-6 subsequently report trends in the number of merchant exporters and vertically integrated firms, respectively. We now see that the growth in both types of firms is steeper in the post-1985 period for the Palanpuris. The Kathiawaris grow significantly more slowly than the Palanpuris, for both types of firms, in both time periods. Although the Marwaris are slow to vertically integrate as well, the growth in the number of merchant exporters is steeper for the Marwaris than for the Palanpuris in the pre-1985 period (this pattern, however, is reversed in the post-1985 period). Excluding merchant exporters and vertically integrated firms from the sample in Columns 7-8, the Palanpuri network actually grows more slowly in the post-1985 than in the pre-1985 period. In contrast, the Kathiawari network increases by about 1.5 firms per year in the pre-1985 period and by as much as 7 firms per year in the post-1985 period, which is significantly faster than the growth in the Palanpuri network. The Marwari network, in contrast, lags behind the other communities in

[25]Although the theoretical framework provides one explanation, based on outside options, for why the Kathiawaris may be less likely to vertically integrate, an alternative explanation is that their rural, less Westernized background makes it difficult for them to live abroad. However, the Kathiawaris are nearly as likely as the Marwaris and Palanpuris to set up branches in the United States, Asia and Europe to market polished diamonds, and the increase in the number of these branches among the Kathiawaris matches the corresponding increase for the Palanpuris during the 1990s. Recall that networks are less important and that firms effectively operate independently on the polished side of the market.

both time periods.

5.4 Changes in Marriage Patterns

Although the number of Kathiawari firms does grow faster than the number of Palanpuri firms from the mid-1980s onwards, the relatively small difference in trajectories does not seem sufficient to explain the rapidly expanding gap in the ability of entering firms across communities over time. The discussion that follows considers the role that investments in the network, measured by intra-industry marriage, might have played in supporting this differential entry across communities.

The theoretical framework predicts that investments in the network should be increasing at the margin over time (across cohorts). Once we allow for secular changes in the industry, which are equivalent to changes in outside options u^j in our framework, it is evident that the sign of $d\Delta\omega_t^j/dt$ is ambiguous. However, $d^2\Delta\omega_t^j/d\tilde{\alpha}dt$ continues to be negative, implying that investments in the Kathiawari network should continue to grow faster *relative* to investments in the other communities over time.

Table 9, Column 1 studies marriage choices of firm owners using the same specification as in equation (9). The dependent variable takes the value one if the spouse's family was in the diamond industry prior to their marriage, zero otherwise. The regressors include the firm's establishment year, a full set of community dummies, and the interaction of the establishment year with the community dummies. The establishment year coefficient is negative but insignificant; we have already noted that this coefficient cannot be interpreted once we allow for secular changes within the industry. More importantly, the Kathiawari - establishment year coefficient is positive and significant, precisely as predicted by the model.

Conditional on entry into the industry, entrepreneurs select by ability into the network in our model. We saw in Table 6 that the entrepreneur's age provided information about his ability and so Table 9, Column 2 includes age and age interacted with the community dummies as additional regressors. The Kathiawari- establishment year coefficient continues to be positive, but is smaller in magnitude and no longer significant at conventional levels. Although the model assumes for simplicity that entrepreneurs enter the industry and select into the network (marry) at the same point in time, this is not necessarily the case in practice. Marriages occur within a narrow age-window in this society. An entrepreneur who enters the industry at a late age is consequently likely to be married already and so the option of marrying within the industry will not be available to him. Conditional on age,

a later establishment year mechanically lowers the probability of intra-industry marriage, biasing the estimated establishment year coefficient downward.

To correct this bias we would need to include the individual's age at establishment AEY_i as an additional regressor. $AEY_i = AGE_i - (2004 - EY_i)$, where AGE_i is the entrepreneur's age in the survey year (2004) and EY_i is the firm's establishment year. AEY_i is a linear function of AGE_i and EY_i and so all three variables cannot be included as regressors simultaneously. AGE_i is consequently replaced by AEY_i, together with the accompanying interaction terms, in Table 9, Column 3. AGE_i is now omitted as a regressor but we have already seen in Table 6 that its omission provides us with conservative estimates of the community gap. The Kathiawari-establishment year coefficient is positive and significant in Column 3 and close in magnitude to what we obtained in Column 1. Omitting vertically integrated firms and merchant exporters from the sample in Column 4, the Kathiawari-establishment year coefficient with the reduced sample of network firms is similar to what we obtained in Column 3 and continues to be precisely estimated.

Apart from his own marriage decision, the entrepreneur could also invest in the network through the marriage choices he makes for his children. Table 9, Columns 5-8 repeat the regressions that we ran for the entrepreneur, with children's marriage choice as the dependent variable. The child's gender is now included as an additional regressor but the specifications from Columns 1-4 are otherwise unchanged. Children's marriage choices are less likely to be mechanically determined by the entrepreneur's age when the firm was established. As expected, the Kathiawari-establishment year coefficient is positive and significant without exception in Columns 5-8, even with the age terms as regressors.

To provide a sense of the economic importance of these cross-community differences in marriage patterns, Figure 5 presents nonparametric estimates of the relationship between the entrepreneur's marriage choice and the firm's establishment year, corresponding to the specification in Column 3.[26] As is sometimes the case with kernel regressions, the marriage estimates are unstable in the tails, with predicted marriage prevalence decreasing sharply for Marwaris and Palanpuris in the pre-1975 period and increasing sharply for both communities in the post-2000 period. To clarify the exposition, Figure 5 consequently restricts attention to the 1975-2000 period. The estimates in this period match the statistics reported in Table 2 with the full sample, which indicated that 16% of the Marwaris and 45% of the Palanpuris married within the industry. Moreover, there is no discernable time trend in marriage prevalence among the Marwaris or Palanpuris, matching the parametric estimates in Table

[26]The age at establishment terms are netted out using the same two-step procedure as in Figure 1.

9. In contrast, intra-industry marriage increases rapidly among the Katiawaris, starting at zero in 1975 and reaching 45% by 2000, matching the statistics in Table 2 and Table 9 once again.[27] Munshi and Rosenzweig (2005, 2006) describe how individuals at the top of the ability or wealth distribution in their sub-caste start to exit, with an accompanying increase in out-marriage, as their networks start to decay. In this paper we observe the opposite pattern, with a decline in the marginal entrant's ability and an increase in intra-industry marriage as the Kathiawari network matures over time.

Our explanation for the cross-community patterns in Table 9 and Figure 5 is that intra-industry marriage is associated with investments in an underlying network, which consequently strengthens relatively rapidly in the Kathiawari community.[28] However, non-network explanations for these results are also available. For example, the number of Kathiawari firms increased relatively rapidly over time, which would have expanded the pool of prospective partners from within the industry for that community. Alternatively, the rapid increase in intra-industry marriage among the Kathiawaris could simply reflect convergence across communities to the same steady-state level. It is unlikely that the relatively small difference in the Kathiawari and Palanpuri trajectories reported in Table 8 could explain the substantial cross-community differences in Figure 5 and the convergence explanation is silent on the persistently low level of intra-industry marriage among the Marwaris. Nevertheless, we proceed to provide additional support for the link between networks and marriage in Table 10.

By specifying that the cost of investing in the network (marrying within the industry) was increasing in ability in Section 4, we ensured that high ability entrepreneurs would select out of the network. We then assumed that those entrepreneurs would form vertically integrated firms or operate as merchant exporters. Controlling for average ability within the community at each point in time with the firm's establishment year, a full set of community dummies, and the interaction of the establishment year with these dummies, we see in Table 10, Columns 1-3 that network firms have lower observed ability as predicted, although the network coefficient is only significant at the 10 percent level. Further, entrepreneurs and their children from network firms are significantly more likely to

[27]The cross-community differences corresponding to Figure 5 for the children are even more dramatic, matching the substantially larger Kathiawari-establishment year coefficient in Table 9. While the proportion of Palanpuris marrying within the industry stays roughly constant at 0.65 and the corresponding proportion for the Marwaris increases slightly over time, almost all Kathiawari children marry within the industry by 2000.

[28]Munshi and Rosenzweig (2005) show that an exogenous decline in the quality of caste-based insurance arrangements leads individuals to exit their networks by marrying outside the sub-caste. By the same argument, an exogenous improvement in the quality of the Kathiawari network would have generated an increase in intra-industry marriage since diamond families would find it difficult to match with comparable families outside the industry. Although such a marriage *response* remains a possibility, I am aware of no other plausible explanation, other than the marriage mechanism, through which the Kathiawari network strengthened over time.

marry within the industry in Columns 4-5, directly establishing the connection between networks and marriage assumed in the model.

6 Conclusion

Entrepreneurship has been traditionally concentrated in the hands of a few small communities in most developing economies. As these economies restructure and make the transition to a steeper growth path, it is evident that these communities will be unable to satisfy the increased demand for new entrepreneurs. The analysis in this paper suggests that entrepreneurs without a family background in business will fill the gap, even in industries where connections matter a great deal, using their own community networks to support business activity. Indeed, the theoretical framework developed in this paper indicates that these networks will strengthen most rapidly in communities with poor outside options once they do crystallize.

The analysis in this paper is based on a single community in a single industry. Would we expect this experience to be repeated elsewhere when new entrepreneurial opportunities become available? Barriers to entry are exceptionally high in the diamond industry, due to the particular nature of the product and the trust-based nature of the business, and we would, if anything, expect new groups to face much less resistance in other industries. Prior to entering the diamond business, the Kathiawaris had an undistinguished history, working as agricultural laborers for centuries and more recently as industrial workers. They had the good fortune to be employed in a dynamic industry in which a confluence of favorable circumstances generated a demand for new entrepreneurs, and based on the analysis in this paper there is no reason why the same outcome would not have been obtained in any other setting where new business opportunities became available.

While this paper focusses on community networks as the mechanism through which new entrepreneurship can be supported, could subsidized bank credit play a similar role? In the diamond industry, bank credit would have allowed newcomers to buy roughs on cash in Antwerp, lowering barriers to entry into the industry. Diamond firms have few fixed assets and banks must use their rough inventory as security when providing them with credit. The value of rough diamonds is uncertain and easily manipulated, and so it is no surprise that banks have historically kept away from this industry. However, this position has changed dramatically with financial liberalization in India. Ten years ago, three banks provided credit to the industry. Today, 59 banks provide credit and the current

outstandings are estimated to be close to four billion dollars.

This surge in bank credit allowed firms to compete vigorously for roughs in Antwerp, pushing up the price and encouraging DeBeers and other primary suppliers to unload their rough stocks on the market. The increase in the polished diamond supply that followed quickly outstripped the demand and we noted in Section 3 that the delay in payment on the polished side of the market had lengthened substantially by 2004-05. This delay made it difficult for firms to repay their rough suppliers in a timely fashion and starting from October 2005, the rough suppliers in Antwerp cut back drastically on their credit to diamond firms. Without supplier credit, which continues to be the main source of capital in the industry, the rough diamonds cannot move and the industry is now in a downturn. The past few months have witnessed the unprecedented phenomenon of sightholders refusing to accept their boxes of roughs, which were once a prized commodity, from the DTC and industry observers predict that the downturn in the industry is unlikely to be rectified in the immediate future (IDEXmagazine, Issue no. 198, October 10, 2006).

There are two reasons why the rough suppliers cut back on credit. First, the availability of bank credit without sufficient monitoring allowed firms to buy roughs recklessly, pushing up the price and increasing delays in payment and default rates. Second, firms that now had access to bank credit had less to lose by reneging on their obligations to the network, providing another channel through which defaults would have increased. Networks that took many decades to mature have now been undermined and it is not clear that they will be in a position to provide their former levels of support when the industry corrects itself and recovers from the current downturn. The banks could, in principle, have exploited the monitoring and enforcement capability of the networks to judiciously increase the supply of capital and stimulate entry, as well as growth in the industry. Instead, the indiscriminate provision of bank credit may have undermined an institution based on trust that took many decades to develop, leaving the industry less stable in the future.

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Table 1: Referral Pattern

Source of referrals:	number of individuals that provided referrals	total number of referrals provided	percent of referrals for Kathiawaris	percent of referrals for Marwaris	percent of referrals for Palanpuris
	(1)	(2)	(3)	(4)	(5)
Kathiawari exporters	60	212	74.06	2.83	20.28
Marwari exporters	24	206	12.62	42.72	37.86
Palanpuri exporters	128	707	9.19	9.05	78.64
Brokers	47	239	31.38	14.23	51.05
Other	36	109	18.35	21.10	49.54

Note: Other sources of referrals include personal connections of the survey team and firms belonging to other communities.
A total of 295 individuals provided referrals in Column 1.
These individuals provided a total of 1,473 referrals in Column 2.
Columns 3-5 sum to approximately 95% because some referrals are also made to exporters from other communities.

Table 2: Characteristics of the Entrepreneurs

Community:	Kathiawari	Marwari	Palanpuri
	(1)	(2)	(3)
Panel A: Individual characteristics			
Age	42.46	46.13	49.05
	(0.77)	(0.92)	(0.52)
Years of schooling	10.84	14.41	12.87
	(0.26)	(0.19)	(0.12)
Percent schooled in English	11.47	47.20	37.28
	(2.16)	(4.48)	(2.41)
Percent that grew up in Mumbai	22.02	26.40	49.38
	(2.81)	(3.96)	(2.49)
Panel B: Family background			
Father's occupation (%)			
Farming	53.02	2.46	2.54
White-collar professional	5.58	13.93	15.52
Other business/store-owner/sales	11.16	27.05	27.23
Other jewelry business	5.12	29.51	11.96
Diamond cutting & polishing	7.44	1.64	6.62
Diamond broker/trader	2.79	3.28	9.92
Diamond exporter	14.88	22.13	26.21
Any business	34.56	82.40	75.81
	(3.24)	(3.42)	(2.14)
Panel C: Marriage choices			
Percent of wives' families in the diamond business	27.98	16.00	44.69
	(3.05)	(3.29)	(2.47)
Percent of wives from the same community	95.87	92.00	90.12
	(1.35)	(2.44)	(1.48)
Number of firms	218	125	405

Note: standard errors in parentheses.

Any business includes other business/store-owner/sales, other jewelry business, diamond broker/trader, and diamond exporter.

Table 3: Individual Preparation for the Diamond Business

Community:	Kathiawari	Marwari	Palanpuri
	(1)	(2)	(3)
Panel A: Work before entry into the diamond industry (%)			
Nothing	80.37	72.00	84.25
Farming	8.88	0.00	0.25
White-collar professional	4.21	8.80	6.50
Jewelry business	2.34	3.20	1.50
Colored stone or pearl business	0.93	8.00	2.00
Other business/store-owner/sales	3.27	8.00	5.50
Any business	6.54	19.20	9.00
	(1.69)	(3.54)	(1.43)
Panel B: Work before entering current firm (%)			
Nothing	20.37	27.42	22.29
Cut & polished diamonds	14.35	0.81	6.97
Manufacturing contractor	12.96	0.81	5.47
Employee/apprentice	32.87	23.39	30.10
Broker	8.80	12.90	10.45
Rough/polished trading	7.87	23.39	14.43
Partner in another firm	2.78	11.29	10.20
Prior preparation for export business	52.31	70.97	65.17
	(3.41)	(4.09)	(2.38)

Note: standard errors in parentheses.

Manufacturing contractor manages cutting and polishing facilities.

Employee/apprentice includes working in a relative's firm.

Any business includes jewelry, colored stone or pearl, and other business/store-owner/sales.

Prior preparation includes employee/apprentice, broker, rough/polished trading, and partner in another firm.

Table 4: Characteristics of the Children

Child's gender:	boy			girl		
Community:	Kathiawari	Marwari	Palanpuri	Kathiawari	Marwari	Palanpuri
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Characteristics of the child						
Age	17.59	19.83	22.60	18.79	17.66	22.59
	(0.60)	(0.92)	(0.47)	(0.74)	(1.01)	(0.50)
Education	13.92	14.98	14.59	13.91	15.24	14.96
	(0.26)	(0.22)	(0.10)	(0.21)	(0.18)	(0.09)
Percent schooled in English	75.30	95.68	90.42	70.95	95.00	90.98
	(2.75)	(1.73)	(1.39)	(3.14)	(2.19)	(1.44)
Child's occupation (%)						
Student	55.92	63.57	44.39	56.22	71.13	49.10
Housewife	0.00	0.00	0.00	33.83	20.62	36.43
White-collar professional	0.82	0.71	0.90	4.48	1.03	6.20
Other business	0.41	0.00	1.12	0.50	0.00	0.78
Other jewelry business	0.00	0.00	0.90	1.99	4.12	2.07
Diamond industry	42.86	35.71	52.69	2.99	3.09	5.43
Panel B: Marriage choices						
Spouse's occupation (%)						
Student	0.00	0.00	1.11	0.00	4.17	0.00
Housewife	80.82	78.38	77.22	0.00	0.00	0.00
White-collar professional	2.74	8.11	7.78	21.25	16.67	10.00
Other business	1.37	0.00	1.67	20.00	33.33	10.56
Other jewelry business	1.37	2.70	3.89	5.00	0.00	1.67
Diamond industry	13.70	10.81	8.33	53.75	45.83	77.78
Percent of spouses' families in the diamond business	46.05	15.79	60.00	48.78	37.04	71.74
	(5.76)	(5.99)	(3.61)	(5.55)	(9.47)	(3.33)
Percent of spouses from the same community	92.21	91.89	85.64	87.95	92.31	92.90
	(3.07)	(4.55)	(2.61)	(3.59)	(5.33)	(1.90)

Note: standard errors in parentheses.

Education is measured as years of schooling for children aged 23 or older.

English schooling refers to the medium of instruction in secondary school.

Table 5: Organization of the Diamond Business

Community:	Kathiawari	Marwari	Palanpuri
	(1)	(2)	(3)
Panel A: Firm characteristics			
Average establishment year	1988.62	1982.72	1978.58
	(0.70)	(1.23)	(0.73)
Exports 1995-1999	108.57	102.58	122.45
	(10.43)	(14.13)	(7.24)
Exports 2000-2004	177.12	134.36	189.51
	(17.28)	(21.43)	(13.16)
Panel B: Rough transactions			
Number of suppliers per year	9.98	11.68	10.76
	(1.17)	(2.71)	(1.13)
Percent of firms with a single dominant supplier	70.78	70.83	71.48
	(3.68)	(6.63)	(2.83)
Percent of roughs sourced directly from Antwerp	76.31	63.18	67.98
	(2.37)	(4.99)	(2.15)
Percent of roughs received on credit	80.78	73.48	75.39
	(2.27)	(4.99)	(2.03)
Average repayment period (days)	102.39	98.29	101.44
	(1.88)	(4.78)	(1.79)
Percent of transactions involving a written agreement	3.95	9.76	6.28
	(1.58)	(4.69)	(1.57)
Panel C: Polished transactions			
Number of buyers per year	33.23	49.57	30.11
	(4.39)	(14.11)	(2.40)
Percent of firms with a single dominant buyer	52.91	69.03	58.65
	(3.49)	(4.37)	(2.56)
Percent of polished sold directly to buyers abroad	59.10	69.42	63.35
	(2.71)	(3.42)	(1.89)
Percent of polished sold on credit	77.20	82.95	84.37
	(1.95)	(2.38)	(1.25)
Average repayment period (days)	102.11	114.24	113.49
	(2.55)	(3.89)	(1.83)
Percent of transactions involving a written agreement	2.99	5.98	5.57
	(1.20)	(2.20)	(1.18)

Note: standard errors in parentheses.
Exports are measured in millions of 1994 Rupees.
Dominant supplier is defined as a supplier who provides more than 30% of the firm's roughs.
Dominant buyer is defined as a buyer who accounts for more than 20% of the firm's polished.
Merchant exporters, who restrict their activity to the polished side of the market, are excluded from Panel A.

Table 6: Selection into the Industry

Sample:	all firms			all firms			network firms		
Dependent variable:	father not farmer	father business	schooling	father not farmer	father business	schooling	father not farmer	father business	schooling
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Establishment year	-0.001	-0.002	-0.022	-0.001	-0.002	-0.030	-0.001	-0.00004	-0.037
	(0.001)	(0.002)	(0.007)	(0.001)	(0.002)	(0.007)	(0.001)	(0.002)	(0.009)
Establishment year - Kathiawari	-0.008	-0.011	-0.017	-0.016	-0.016	-0.065	-0.020	-0.020	-0.059
	(0.004)	(0.004)	(0.024)	(0.004)	(0.004)	(0.025)	(0.005)	(0.005)	(0.026)
Establishment year - Marwari	-0.00004	-0.003	0.025	0.0001	-0.003	0.031	-0.001	-0.006	0.011
	(0.001)	(0.002)	(0.017)	(0.001)	(0.003)	(0.018)	(0.002)	(0.003)	(0.023)
Age terms	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	737	737	737	737	737	737	486	486	486

Note: Standard errors in parentheses clustered by establishment year.

All regressions include community dummies.

Entrepreneur's age is included, uninteracted and interacted with Kathiawari and Marwari dummies, in Columns 4-9.

Business occupations include other business/store-owner/sales, other jewelry business, diamond broker/trader, and diamond exporter.

Schooling is measured as years of educational attainment.

Network firms exclude merchant exporters and vertically integrated firms.

Table 7: Growth in Exports

Dependent variable:	exports							
Sample:	all firms		network firms		excluding separated firms		all firms	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	12.940	14.272	10.491	10.056	14.114	15.293	17.593	20.585
	(2.093)	(1.906)	(1.733)	(1.082)	(2.241)	(1.954)	(4.440)	(3.287)
Year-Kathiawari	1.874	7.419	2.472	7.778	3.453	8.892	2.744	8.266
	(3.938)	(2.223)	(3.723)	(2.243)	(4.054)	(2.411)	(3.803)	(2.362)
Year-Marwari	-7.514	-6.626	-7.412	-3.068	-7.113	-6.504	-8.214	-7.583
	(2.332)	(2.153)	(1.935)	(1.416)	(2.553)	(2.298)	(2.520)	(2.408)
Year-proportion small stones	--	--	--	--	--	--	-0.100	-0.123
							(0.056)	(0.031)
Firm fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Number of observations	6,114	6,114	4,112	4,112	5,233	5,233	5,965	5,965

Note: Standard errors in parentheses clustered by year.

Exports are measured in millions of 1994 Rupees.

Network firms exclude merchant exporters and vertically integrated firms.

Separated firms are formed following a split among original partners.

Proportion small stones measures the proportion of the firm's output that is accounted for by -2, stars, and mele.

All regressions without firm fixed effects include community dummies.

Table 8: Growth in the Number of Firms

Dependent variable:	Number of firms							
Sample:	all firms		merchant exporters		vertically integrated firms		network firms	
Period:	pre-1985	post-1985	pre-1985	post-1985	pre-1985	post-1985	pre-1985	post-1985
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	11.050	7.452	1.077	3.043	0.591	1.293	9.381	3.116
	(0.228)	(0.282)	(0.064)	(0.089)	(0.044)	(0.042)	(0.263)	(0.248)
Year-Kathiawari	-8.437	1.301	-0.490	-1.480	-0.591	-0.838	-7.559	3.619
	(0.322)	(0.399)	(0.091)	(0.125)	(0.062)	(0.060)	(0.372)	(0.351)
Year-Marwari	-8.684	-4.292	0.074	-1.451	-0.309	-1.098	-8.450	-1.743
	(0.322)	(0.399)	(0.091)	(0.125)	(0.062)	(0.060)	(0.372)	(0.351)
Number of observations	60	60	60	60	60	60	60	60

Note: Standard errors in parentheses.

Merchant exporters buy polished stones in the Mumbai market and sell to foreign buyers.

Vertically integrated firms have branches in Antwerp.

Network firms exclude merchant exporters and vertically integrated firms.

All regressions include community dummies.

Table 9: Marriage Choices

Dependent variable:	married within the industry							
Generation:	firm owners				children			
Sample:	all firms			network firms	all firms			network firms
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Establishment year	-0.001	-0.001	0.001	0.001	0.001	0.002	-0.003	-0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.005)	(0.006)
Establishment year - Kathiawari	0.009	0.004	0.011	0.011	0.014	0.010	0.025	0.029
	(0.004)	(0.004)	(0.005)	(0.006)	(0.004)	(0.005)	(0.006)	(0.008)
Establishment year - Marwari	0.003	0.004	-0.003	-0.007	0.008	0.007	0.006	-0.006
	(0.003)	(0.003)	(0.005)	(0.008)	(0.008)	(0.007)	(0.010)	(0.018)
Age terms	No	Yes	No	No	No	Yes	No	No
Age at establishment terms	No	No	Yes	Yes	No	No	Yes	Yes
Number of observations	742	742	742	489	588	588	588	416

Note: Standard errors in parentheses clustered by establishment year.

All regressions include community dummies. Columns 5-8 also include a gender dummy.

Age terms include entrepreneur's age, uninteracted and interacted with Kathiawari and Marwari dummies.

Age at establishment terms include entrepreneur's age in the establishment year, uninteracted and interacted with Kathiawari and Marwari dummies.

Network firms exclude merchant exporters and vertically integrated firms.

Table 10: Selection into the Network

Dependent variable:	entrepreneur's characteristics			married within the industry	
	father not farmer	father business	schooling	entrepreneur	children
	(1)	(2)	(3)	(4)	(5)
Network firm	-0.031	-0.062	-0.396	0.079	0.081
	(0.024)	(0.037)	(0.234)	(0.032)	(0.045)
Number of observations	737	737	737	742	588

Note: Standard errors in parentheses clustered by establishment year.

All regressions include community dummies and establishment year, uninteracted and interacted with Kathiawari and Marwari dummies.

Column 5 also includes a gender dummy.

Network firms exclude merchant exporters and vertically integrated firms.

Figure 1: Change in Entrepreneurial Background

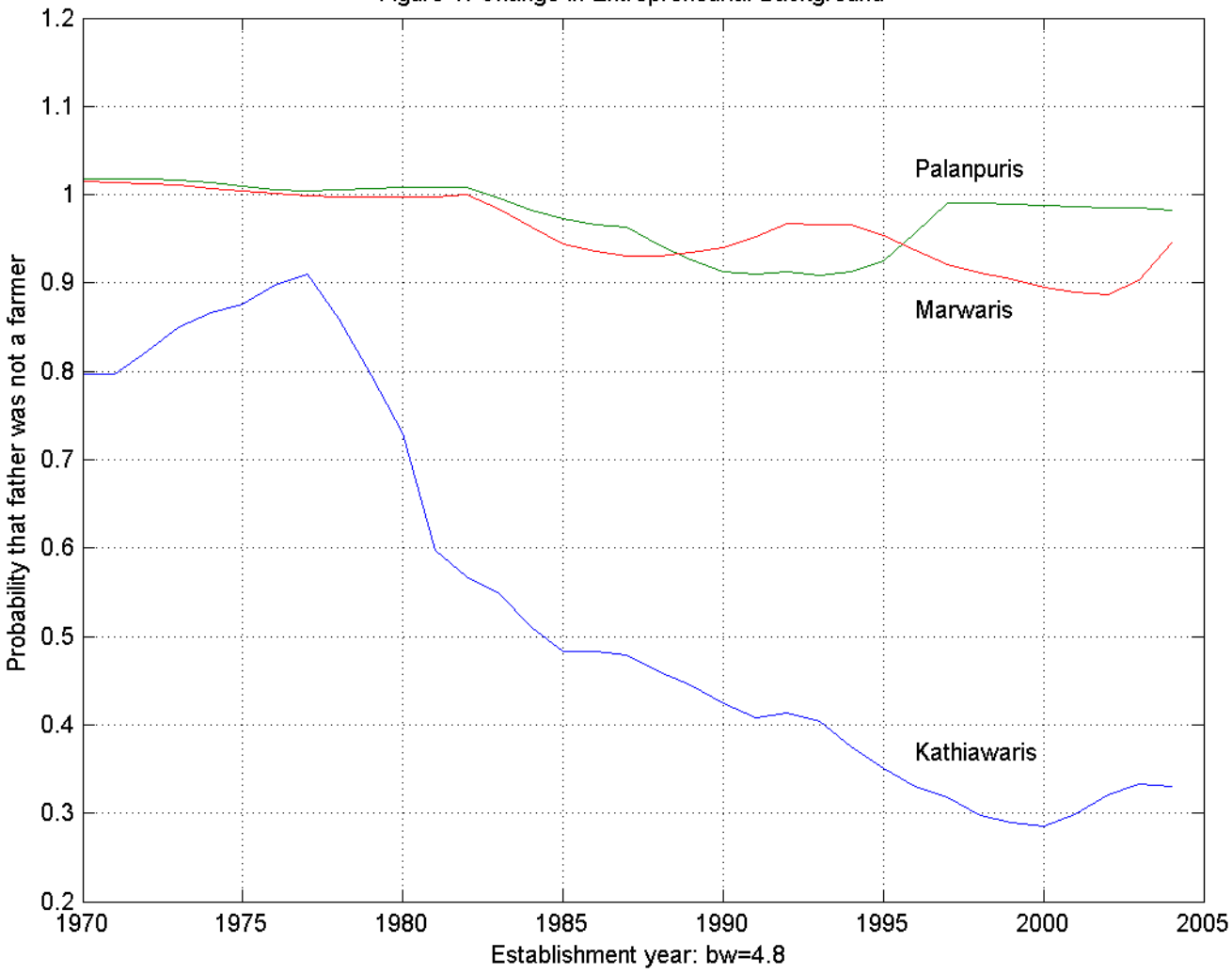

Figure 2: Growth in the Number of Firms

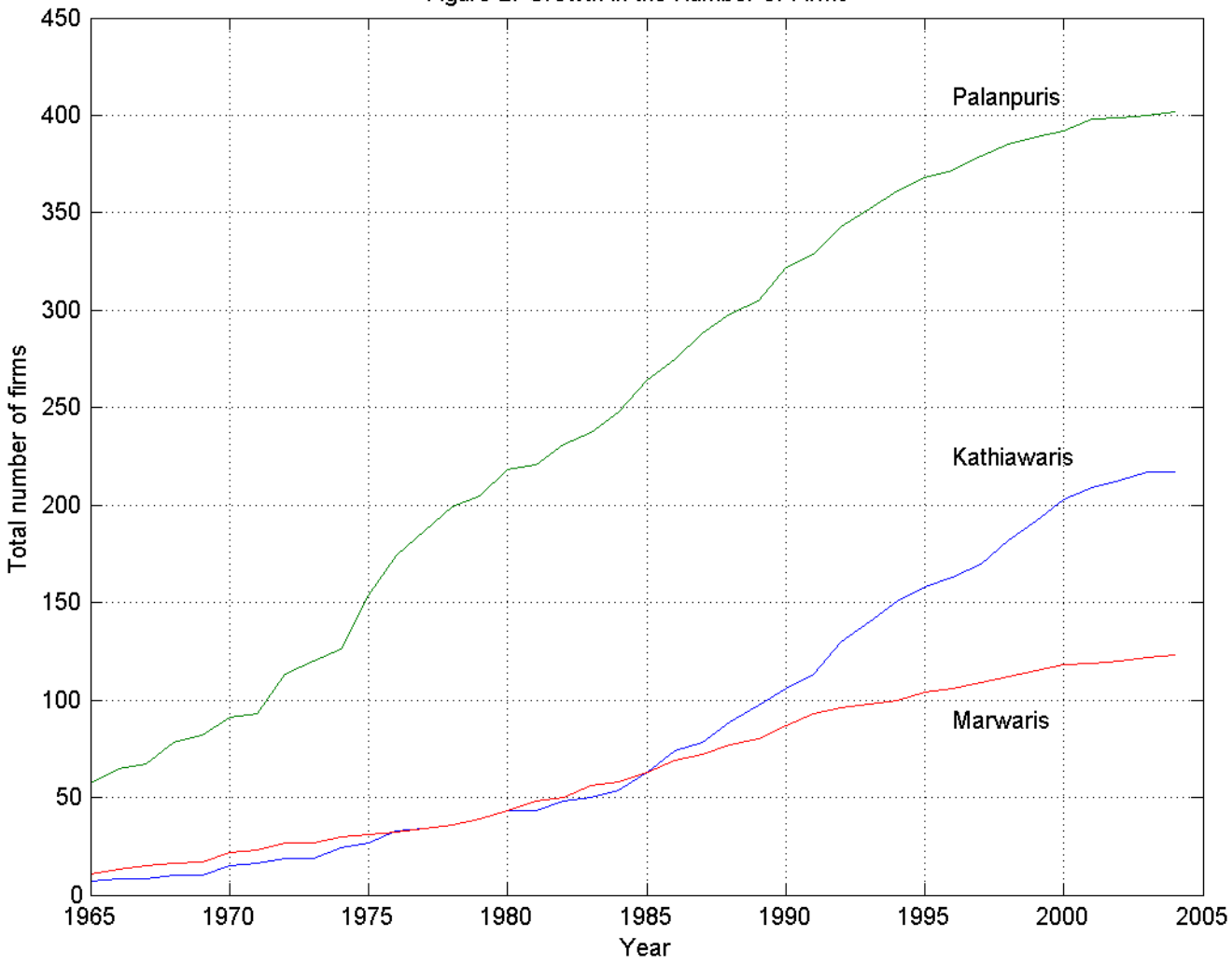

Figure 3: Growth in the Number of Merchant Exporters

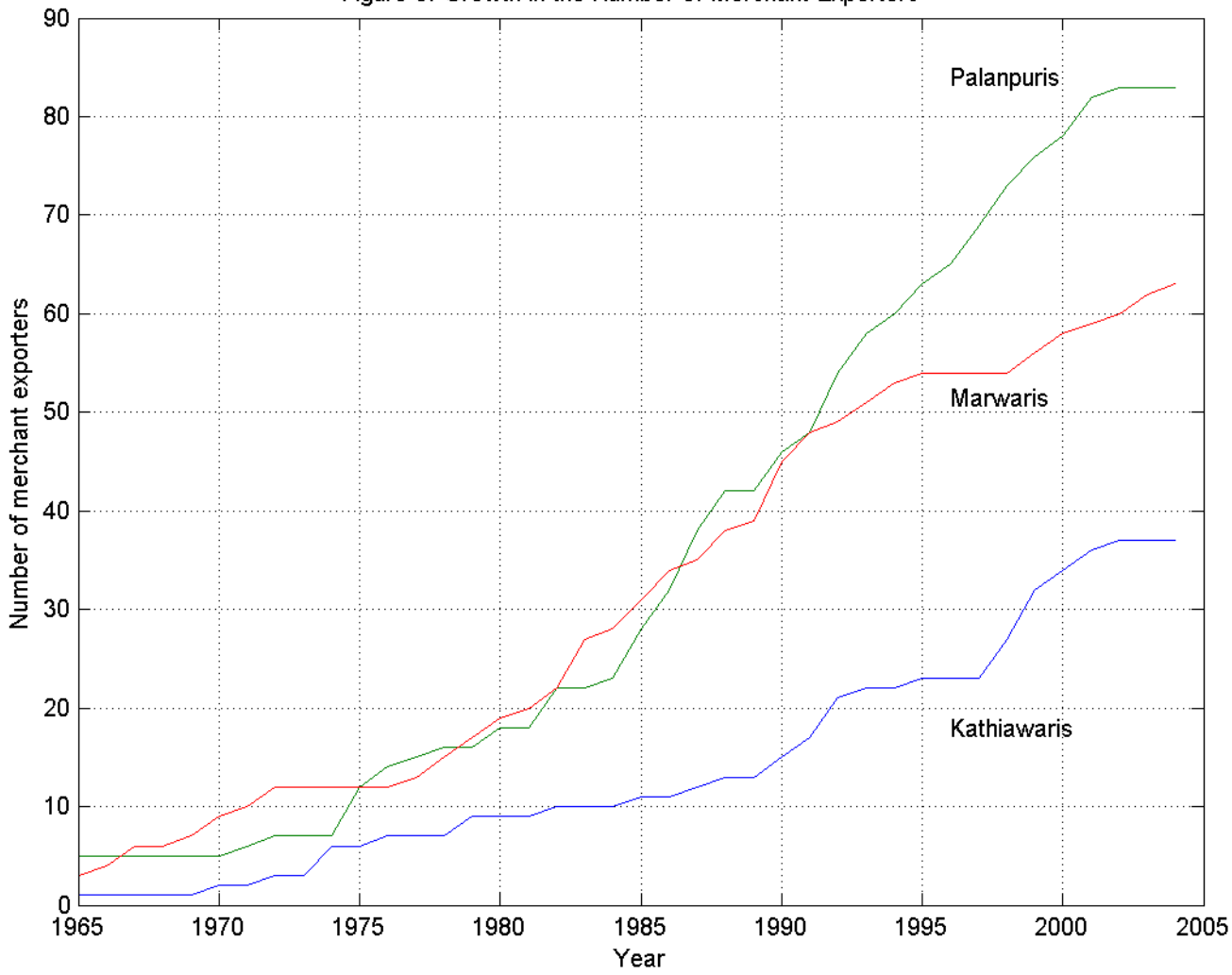

Figure 4: Growth in the Number of Vertically Integrated Firms

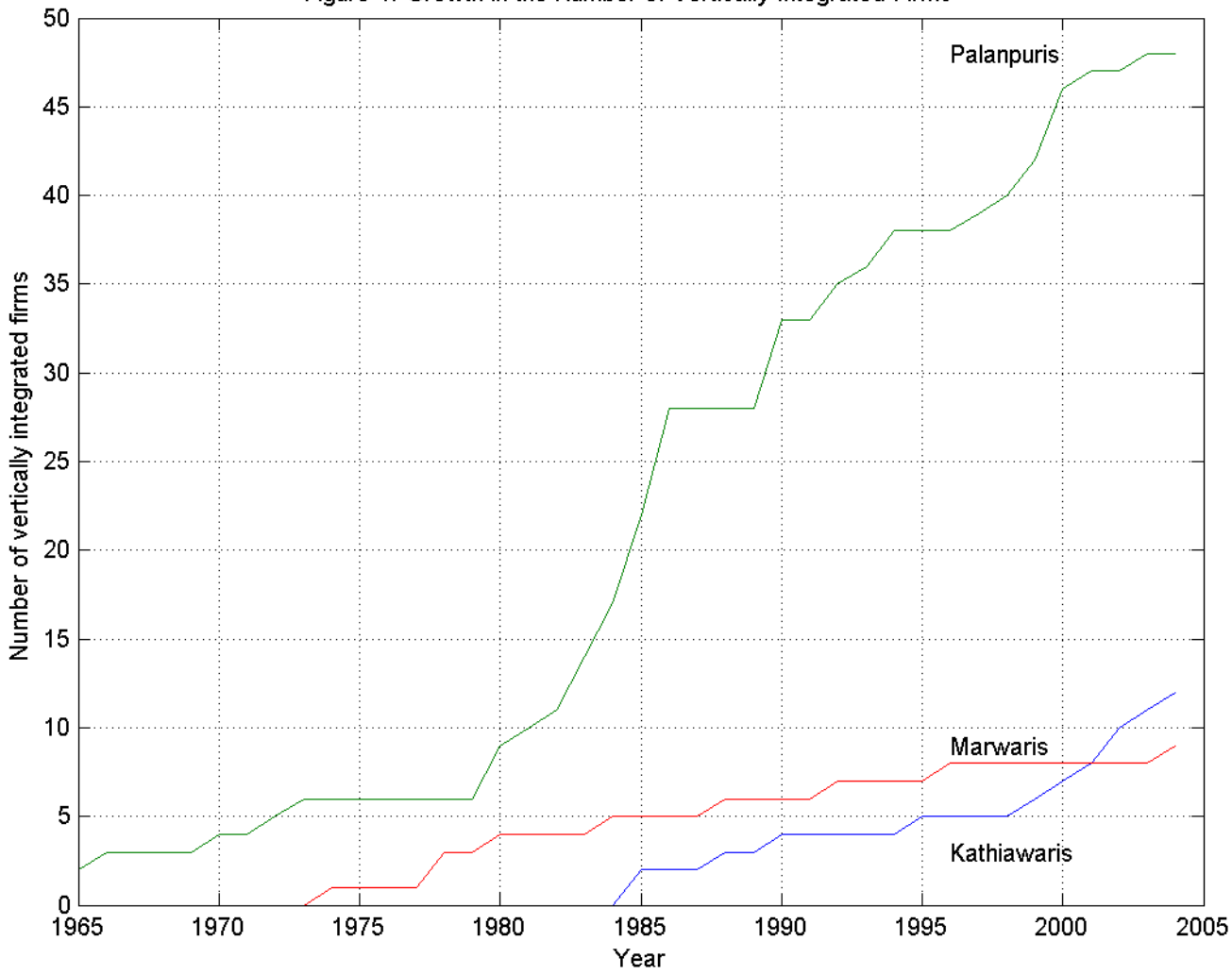

Figure 5: Marriage within the Industry