

Chapter 2

Caste Networks in the Modern Indian Economy

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2.1 Introduction

Why does caste continue to play such an important role in Indian life? One explanation is that ancient inequities and prejudices are slow to change. The higher castes, which exploited the lower castes for centuries, continue to discriminate against them both economically and socially today. A second explanation, which has been the subject of intense public debate, is that caste reservation in higher education and the government has served to perpetuate a system that would otherwise have withered away. While these explanations for caste-persistence are clearly potentially relevant, I focus on a third explanation, which has received relatively little attention. This explanation, which synthesizes research I have conducted in rural and urban India over the past 15 years, is based on the many forms of economic support that the caste provides its members.

In the classical economic model, individuals are allocated to jobs on the basis of their ability, which, in turn, determines investments in human capital. Once we move away from this idealized world, however, the economic model becomes more complex. With liquidity constraints, parental income and not just individual ability determines educational attainment and, ultimately, occupational choice. Once we introduce imperfections in the labor market, the most qualified individual no longer necessarily gets the job. This is a world that perhaps better describes a developing economy than the classical model. In such a world, social networks can help individuals overcome barriers to schooling and jobs and can, more generally, substitute for market institutions.

For example, in an economy with imperfect labor markets, firms will use referrals from incumbent workers when making new hires. The incumbent worker has better information about the quality of a potential hire than the firm if they

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belong to the same social group. He can also use social sanctions to discipline the new worker if he shirks on the job *ex post*. Incumbent workers have a reputation to maintain with their firms (and the rents that go with that reputation). This will encourage them to use their social connections to solve the information and enforcement problems described above, and this is why labor market networks are organized around social groups throughout the world (e.g., Morris 1965; Rees 1966; Massy et al. 1987; Chandavarkar 1994; Munshi 2003).

Alternatively, in an economy where market insurance is unavailable, risk-averse individuals can increase their welfare by joining mutual insurance networks. A member of such a network who receives a negative income shock in a given period receives transfers in cash or kind from other members, which allow him to smooth his consumption. He will, in turn, reciprocate in the future by helping other members of the network when they receive a negative shock. For such an arrangement to be viable, the network must have good information about the income realizations of all members and it must be able to punish those who renege on their obligations. This is why mutual insurance networks are also organized within tight-knit social groups, such as the neighborhood or kin-group, throughout the world (e.g., Townsend 1994; Grimard 1997; Ligon et al. 2002; Fafchamps and Lund 2003; Cabrales et al. 2003).

Social networks support diverse economic activities, and not just mutual insurance and job referrals. In all of these activities, they use the information and the social sanctions at their disposal to support cooperation and solve market imperfections. In India, the natural social unit around which networks would be organized is the endogamous (sub) caste or *jati*. The basic marriage rule in Hindu society is that individuals must find a partner within their own caste. Non-Hindu communities, such as the Parsis and the Bohris, follow the same rule. The dense web of marriage ties that form within a caste over many generations supports the flow of information. Given the spatial segregation by caste that continues to characterize the Indian village, social interactions also typically take place within the caste. Exclusion from these social interactions (and the marriage market) can be a powerful punishment device. Mutual insurance arrangements were, not surprisingly, historically organized within the caste, and recent evidence that I discuss below indicates that these arrangements continue to be active in rural India.

What is perhaps more surprising is that caste networks continue to be active in the city. These urban networks first formed with the growth of cities under colonial rule in the eighteenth century. Particular rural castes (and non-Hindu communities) took advantage of the opportunities that became available at that time to move into business and overseas trade. Some of these new business communities, such as the Parsis, later moved into industry. Other castes found niches in the urban labor market; in the factories, mills, and docks. They maintained these occupational niches from one generation to the next into the twentieth century. Some of these jobs, such as blue-collar jobs in Mumbai, have disappeared with the restructuring of the Indian economy over the past two decades. But this restructuring has at the same time created new opportunities in smaller manufacturing centers throughout the country as well as in business, where networks will continue to be relevant.

Caste networks will remain active, and the caste system will retain its salience as long as markets function imperfectly.

Mobility is the hallmark of the modern market economy. Although individuals might be tied to the land they are born on and the occupations they inherit from their parents in a traditional economy, the emergence of the market allows individuals to seek out jobs and locations that are best suited to their talents and abilities. In a transition economy, social networks will reduce the frictions created by inefficient markets by supporting spatial and occupational mobility. Consider, for example, business activity. An individual who is born into a business family in a developing economy will inherit wealth, connections, and occupation-specific human capital from his father. Without these inherited advantages, it is difficult for even an extremely talented individual to succeed in business. What social networks do is to effectively substitute for family connections, with groups of first-generation entrepreneurs drawn from the same community providing mutual support to each other and bootstrapping their way out of traditional occupations. Once a community is established in business, later generations of entrepreneurs can operate without the support of the network by relying on their inherited family connections. But without a network to jumpstart the transition from the traditional occupation into business in the first generation, occupational mobility would not occur on a large scale.

The role played by networks in supporting mobility is not restricted to business. As noted, caste networks have historically supported migration from the village to the city, with accompanying occupational mobility. This movement occurs even today, as new opportunities (not necessarily business opportunities) open up and specific castes are positioned to take advantage of them. Caste networks have historically displayed a high degree of flexibility, shifting from the village to the city and from mutual insurance to other economic activity as new opportunities became available. I will provide evidence below that these networks may even have expanded the domain from private economic activity to the public sphere, solving leadership commitment problems in Indian local governments (*panchayats*). Despite this flexibility, we will see that there is ultimately no perfect substitute for well-functioning markets.

Networks support economic activity *within* the community because information flows smoothly and collective punishments can be effectively enforced. However, this also implies that economic activity cannot cross community boundaries in a network-based economy, and this can result in the misallocation of resources *across* communities. Continuing with the example of the business networks, while these networks may support the mobility of their members in a small number of fortunate communities, talented individuals from other communities will still be excluded from business activity. Apart from these static inefficiencies, networks can also give rise to dynamic inefficiencies. Self-interested individuals will not internalize the benefit they provide to other members of the network through their participation. This implies that it can be welfare enhancing for the community to place tacit restrictions on exit from the network and independent individual mobility, as often observed in blue-collar communities. When the economy restructures many generations later, however, these restrictions may no longer be welfare enhancing, and

the same institution that supported mobility when it first formed will now prevent its members from taking advantage of new opportunities.

Despite their importance, the role played by caste networks in the Indian economy and in India's development process remains poorly understood. In the sections that follow, I will describe how caste networks have historically supported and continue to support economic activity and mobility. I will also present specific examples of the static and dynamic inefficiencies that are associated with these non-market institutions so as to provide a more balanced assessment of their contribution to growth and the macro economy.

2.2 Caste Networks in Rural and Urban India

If caste networks substitute for inefficient market institutions, then the obvious place to look for them is where markets function imperfectly. We start with rural India, where rain-fed agriculture continues to be widespread, resulting in wide fluctuations in rural income from one year to the next. Rural households must also face major (but less frequent) contingencies associated with illness and marriage, which are equivalent to negative income shocks, without access to market insurance. Munshi and Rosenzweig (2009) use various data sources to show that transfers from caste members are important and preferred mechanisms through which consumption is smoothed in response to these income fluctuations.

Much of our evidence is based on the 1982 and 1999 rounds of the Rural Economic Development Survey (REDS) conducted by the National Council of Applied Economic Research (NCAER). This survey covers a representative sample of rural households and provides information on loans and gifts given and received by caste members. It also provides information on loans received from banks, moneylenders, employers, and other sources. A large fraction of households—25 % in 1982 and 20 % in 1999—participated in the caste-based mutual insurance arrangement, giving or receiving transfers in the year prior to each survey round. If we expanded the time frame, we would expect virtually all households to have participated in the insurance network at one point or another. A key feature of the REDS is that information on source and purpose is provided for every loan that was outstanding at the beginning of the reference period (the year prior to the survey) or obtained during the reference period. Focusing on the 1982 round, which provides more detail on the activities for which the loans are used, we find that banks are the dominant source of credit, accounting for 65 % of all loans in value. However, caste loans are the dominant source of informal loans, making up 14 % of the total value of loans received by households in the year prior to the survey, which is more than the amount households receive from moneylenders (8 %), friends (8 %), and employers (6 %). Looking at the purpose for which the loans are used, caste loans are disproportionately used to cover consumption expenses and to meet contingencies such as illness and marriage. Indeed, caste loans are the dominant source of credit, more important than bank credit, for these activities.

Providing independent support for the importance of caste loans, Caldwell et al. (1986) surveyed nine villages in South India after a two-year drought and found that nearly half of the sampled households had taken consumption loans during the drought. The sources of these loans (by value) were banks (18 %), moneylenders, landlords, and employers (28 %), and relatives and caste members (54 %). These descriptive statistics are from the 1980s and 1990s. More recent evidence from the 2005 India Human Development Survey (IHDS) conducted on a nationally representative sample of rural households indicates that caste loans have continued to maintain their importance. Although the survey does not explicitly list caste as a category, it does identify loans from relatives. Some interest-bearing loans received from caste members may have been listed in the “Moneylender” category or misclassified in the “Other” category. Other loans without interest received from caste members may have been assigned to the “Friends” category. Nevertheless, the basic patterns documented in the REDS surveys remain unchanged. Caste loans, or more correctly loans from relatives, make up 9 % of all loans by value, more than both friends and employers. Looking across purposes, caste loans are once again most useful for smoothing consumption and meeting contingencies.

How well do caste networks function? Based on Townsend’s (1994) work in rural India, many studies have implemented a test of full risk-sharing in which a key implication is that household consumption should be completely determined by aggregate consumption in the group around which the mutual insurance is organized and, in addition, should be independent of transitory income shocks. Although individuals may receive loans from moneylenders, employers, and other individuals outside their *jati* with whom they have established close bilateral relations, the interactions that are needed to support collective punishments and sustain cooperative behavior at the level of the group occur predominantly within *jatis*. Previous contributions to the risk-sharing literature that are situated in rural India have treated the village as the social unit, whereas we argue instead that the *jati*, which extends beyond village boundaries, is the relevant unit around which the insurance network is organized.

Munshi and Rosenzweig (2009) report results from Townsend’s test of full risk-sharing, using a national panel sample of rural households over a three-year period, 1969–1971 to assess if household consumption co-moves with aggregate *jati* consumption. An extremely high degree of consumption smoothing is sustained at the level of the *jati*, although we formally reject full risk-sharing, matching the results from many previous studies (see, for example, Townsend 1994; Grimard 1997; Ligon 1998; Fafchamps and Lund 2003). Additional robustness tests that control for consumption outside the *jati* in the village, and study the co-movement of household consumption with *jati* consumption outside the village, reinforce the claim that the *jati* is the appropriate domain of the insurance network. Moreover, while it is standard practice to assume that risk preferences are homogeneous, Mazzocco and Saini (2012) argue that this assumption can also lead to conservative estimates of the degree of risk-sharing. When this assumption is relaxed, Mazzocco and Saini demonstrate, using ICRISAT data from rural south India, that full

risk-sharing is obtained at the level of the *jati* but not the village. This leads them to conclude, as we do, that the correct risk-sharing unit in rural India is the *jati* rather than the village.

While the primary role of caste networks in the village may be to provide insurance (and credit), the focus shifts to the labor market in the city. Caste-based labor market networks can be traced back to the colonial period and the urbanization and industrialization that came with it. For example, Mumbai's industrial economy in the late nineteenth century and through the first half of the twentieth century was characterized by wide fluctuations in the demand for labor (Chandavarkar 1994). Such frequent job turnover can give rise to labor market networks, particularly when the quality of a freshly hired worker is difficult to assess and performance-contingent wage contracts cannot be implemented. Given the information and enforcement problems that are associated with the recruitment of short-term labor, particularly in working class jobs, the caste was the natural social unit around which these networks could be organized. The presence of caste-based recruitment networks has indeed been documented by numerous historians studying Mumbai's economy prior to independence in 1947 (Chandavarkar 1994; Morris 1965; Burnett-Hurst 1925). These networks appear to have been organized by the jobber, a foreman who was in charge of a work gang in the mill, factory, dockyard, or construction site, and more importantly also in charge of labor recruitment. The jobber typically selected new workers from his caste (and native village), and similar patterns of caste-based recruitment have been documented elsewhere in India (see, for example, Luke and Munshi 2011).

The widespread use of caste-based networks led to a fragmentation of the Mumbai labor market along social lines, and these patterns tended to persist over many generations. Patel (1963) surveyed 500 mill workers in Mumbai's Parel area in 1961–1962 and found that 81 % of the workers had relatives or members of their caste in the textile industry and 66 % of these workers got jobs in the mills through the influence of their relatives and friends. Similarly, Dandekar (1986) traces the evolution of a network of Jadhavs (a particular caste) belonging to one village in interior Maharashtra. In 1942, 67 % of the Jadhav migrants from that village were working in the textile mills and 4 % in other factories. 35 years later, in 1977, 58 % were still employed in textile mills, while just 10 % were in other manufacturing industries.

More recently, in 2001, Munshi and Rosenzweig surveyed the parents of school children who entered school (first grade) in Mumbai's Dadar area between 1982 and 2001. 44 % of the fathers in white-collar occupations and as many as 68 % of fathers in working class occupations reported receiving help from a relative or caste member in finding their first job. Variation in occupational patterns across castes appears to have persisted into the next generation, despite substantial restructuring of the local economy with globalization and the decline of the manufacturing sector in the 1990s. Munshi and Rosenzweig find that boys belonging to traditionally working class castes are more likely to be sent to Marathi-medium schools, which channel them into working class jobs, and that these caste differences remain strong through the 1990s, despite massive changes in labor market opportunities.

The working class jobs are rapidly disappearing from Mumbai's economy, and the caste networks that historically provided access to these jobs will inevitably disintegrate. However, new labor networks will continue to form in other manufacturing centers where working class jobs are growing. In a commercial center like Mumbai, and more generally in any developing economy, community networks will also support entrepreneurship. The son of a businessman in a developing economy has many advantages. He inherits wealth from his father, which allows him to do business even when bank credit is unavailable. He also inherits connections and learns business-specific skills. Without the good fortune of being born into a business family, this implies that most first-generation entrepreneurs can only succeed with the support of a community network. The network effectively substitutes for parental support, allowing groups of first-generation entrepreneurs to bootstrap their way out of traditional occupations into business.

An individual who participates in a business network receives credit and connections from other members. In return for these benefits, he must reciprocate by providing credit and connections to others in the future. This creates obvious information and commitment problems, and so it is not surprising that business networks in India have historically been organized around castes or communities (Timberg 1978; Rudner 1994). This movement of entire castes or communities into business goes back, once again, to the colonial period. Communities like the Parsis and the Bohris took advantage of the new opportunities for overseas trade to move in large numbers into business. More recently, a new business class that is active across diverse industries has emerged in post-colonial India, drawn from a selected group of agricultural castes and from castes that historically dominated the bureaucracy and various white-collar professions (Damodaran 2008). To illustrate this occupational transition, the next section describes the movement of Tamil Gounders from agriculture into the textile industry. Later, we will study how the Kanbi Patels moved from agricultural labor into the diamond business.

Once a new business network is established, the second generation will be the sons of businessmen and, therefore, less dependent on the now established network. While the clustering of business activity within particular communities will continue from one generation to the next, this does not necessarily imply that it is being driven by underlying networks. For example, a Times of India article (October 20, 2006) estimates that Gujarati, Marwari, and Parsi promoted companies account for 36 % of the market capitalization of the BSE-500 index (which, in turn, is 92 % of the total Bombay Stock Exchange market capitalization). These publicly listed firms are, by definition, not reliant on their networks. But it is very possible that the initial movement of large numbers of Gujaratis, Marawaris, and Parsis into business could not have occurred without the support of a network. New caste-based business networks will continue to emerge as long as new opportunities continue to arise, and as long as some of these opportunities are available to individuals without a family background in business.

2.3 Caste Networks and the Misallocation of Factors of Production

Up to this point, the discussion has focused on the positive aspects of caste networks, in particular, their ability to facilitate economic activity when markets function imperfectly. However, there is no substitute for a well-functioning market economy, and these informal arrangements will inevitably introduce inefficiencies of their own. One inefficiency that arises in a network-based economy is that economic activity cannot cross social boundaries, by definition, since it is social tie that solves information and commitment problems. This can result in the misallocation of factors of production, as documented, for example, in Banerjee and Munshi's (2004) study of Tirupur's knitted garment industry.

This town in Tamil Nadu supplies 70 % of India's knitted garment exports and is dominated by a wealthy caste, the Vellala Gounders, who were traditionally engaged in agriculture. The cultivation of cash crops, especially cotton, allowed the Gounders to accumulate substantial wealth, starting in the nineteenth century and continuing into the twentieth century. Without well-functioning capital markets, there were few opportunities for the Gounders to invest their wealth outside of agriculture. This is presumably the reason why this wealthy caste made the transition from agriculture to textile manufacturing when the opportunity presented itself. The textile industry in Tirupur was initially dominated by a local trading community. However, after a prolonged period of labor unrest in the 1960s, it was taken over by the Gounders (Swaminathan and Jeyaranjan 1994). For the next 20 years, the industry continued to be dominated by the Gounders and catered almost exclusively to the domestic market. Starting from the mid-1980s, however, the export of knitted garments from Tirupur started to grow extremely rapidly and by the early 1990s, the annual growth rate was above 50 %. This generated an inflow of new entrepreneurs from outside Tirupur. In 1996, when Banerjee and Munshi conducted a survey of firms in the industry, about half of the exporters were Gounders, while the rest belonged to traditional business communities drawn from all over the country. We exploit this change in the sociological composition of Tirupur's production cluster to provide empirical support for the role played by community networks in providing credit for their members and to show how these networks can give rise to allocative inefficiencies of their own.

Our analysis is based on retrospective panel data over the 1992–1995 period collected from approximately 150 exporters with different levels of experience and belonging to different communities (castes). Two stylized facts motivate the theoretical model and the strategy to identify the underlying networks. First, exports grow faster for the Outsiders than for the Gounders at all levels of experience. Second, the Gounders use roughly twice as much capital per unit of production (exports) as the Outsiders at all levels of experience. Let the export trajectory be determined by entrepreneurial ability and capital, and assume that these inputs are complements. If the cost of capital, i.e., the interest rate, is the same for everyone,

then this implies that more able entrepreneurs will invest more and grow faster. The fact that the export trajectory is steeper for the Outsiders despite having lower capital stock implies that they must have higher ability *and* face a higher interest rate. The fact that different communities effectively face different interest rates implies that credit does not cross community lines and that networks must allocate resources within their respective communities, which is evidently inefficient.

The Gounders are a wealthy landowning caste, and the garment export business was their first foray outside agriculture. Given that they have few alternative uses for their capital, unlike the Outsiders from well-established and diversified business communities, it makes sense that community-specific (within-network) interest rates are lower for them. Nevertheless, could the observed differences between communities be generated by differences in individual ability alone? The model tells us that this could be the case if ability and capital were substitutes rather than complements. The Outsiders, who are endowed with higher ability on average for historical reasons, could invest less in fixed capital and still end up with a steeper export trajectory. The Gounders with lower ability would invest more, even if both communities face the same interest rate, because ability and capital are substitutes. To rule out this explanation, Banerjee and Munshi look within the community. Among the Gounders and, separately, among the Outsiders, firms with a steeper export trajectory invest more, consistent with the hypothesis that ability and capital are complements. It is only when we look *across* communities that less capitalized firms grow faster, presumably because interest rates are positively correlated with ability at the level of the community.

2.4 Caste Networks and Occupational Mobility

Caste networks have supported the occupational and spatial mobility of their members from the British colonial period onward. As discussed, particular agricultural castes took advantage of the growth of cities in the nineteenth century to move as a group and occupy particular niches in the urban economy. Other castes took advantage of opportunities in trade and commerce to move into business. Such movements will continue to occur as long as market institutions fail to support the independent movement of competent individuals into new jobs and occupations.

With globalization and the restructuring of the Indian economy, many new business opportunities have been created over the past two decades. Without the support of a wealthy and connected family, however, potential entrepreneurs acting alone are excluded from such opportunities. While business activity in the decades after independence in 1947 was restricted to a few traditional business communities, Damodaran (2008) describes how many more business communities have emerged in the new economy. Munshi (2011) documents one such occupational transition that recently occurred in the diamond industry, with the movement by a historically disadvantaged caste into business.

The diamond industry has competed with textiles, and more recently with computer software, as the country's top export industry over the past three decades. It is estimated that approximately one thousand Indian diamond export firms employ over a million workers, and that this industry accounts for as much as 85 % (65 % by value) of the rough diamonds cut and polished worldwide (GJEPC 1998; Purani 2000). India does not produce rough diamonds. The rough diamonds are imported, for the most part from Antwerp, and then cut and polished in domestic factories, before being sold on the Mumbai market to foreign buyers or shipped directly abroad. Two distinct supply shocks serve as the point of departure for my empirical analysis: The first shock, in the mid-1960s, allowed Indian firms to use scarce foreign exchange to import rough diamonds. Two traditional business communities—the *Marwaris* and the *Palanpuris*—dominated the business end of the industry from that point onward, leaving the cutting and polishing to a community of lower caste agricultural laborers (the Kanbi Patels) known in the industry as the *Kathiawaris*. The second shock, in the late 1970s, coincided with a huge increase in the world supply of rough diamonds with the opening of Australia's Argyle mines. This allowed Kathiawari firms to enter the business, and today all three communities account for a substantial share of the industry.

Because of the difficulty in enforcing legal contracts, the diamond industry is associated with a high degree of community networking throughout the world. Ultra-orthodox Jews historically dominated the Antwerp market and continue to dominate the New York market (Coleman 1988; Richman 2006). Over 96 % of the nearly 800 firms that I surveyed in the Mumbai market are drawn from just three communities, suggesting that community networks must be active here as well. The survey collected information on each entrepreneur's family background, i.e., whether his father was a businessman, and the year of establishment of his firm. The main empirical result is that while there is a mild weakening in the inherited business background of the Marwaris and Palanpuris entering the industry over time, there is a particularly steep decline in the background of the entering Kathiawaris from the late 1970s onward. Although 70 % of the Kathiawaris who entered the industry in 1970, before the second supply shock, reported that their father was a businessman, this statistic declines steadily through the 1980s and 1990s and drops below 20 % by 2000. My explanation for the relatively high inter-generational mobility observed in the Kathiawari community is that a rapidly strengthening industry-specific network was able to support increasingly disadvantaged entrants over time.

Most diamond exporters visit Antwerp once every month or every other month for a few days to acquire rough diamonds, have these diamonds cut and polished in domestic factories, and then sell the polished diamonds on the Mumbai market or directly to foreign buyers. "Much of the diamond industry revolves around the issue of getting a regular supply of good quality [rough] diamonds" (Engelshoven 2002: 371). Rough suppliers in Antwerp and the largest exporters 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. This implies that they would like to buy from suppliers in Antwerp who happen to be well stocked with the type of stones they specialize in on any given trip, with the set of preferred suppliers changing from one trip to the next. The rough stones are received on credit, without a written contract stipulating the principal, interest rate, and time of repayment, giving rise to a potentially substantial commitment problem.

Based on my conversations with numerous exporters, two solutions are available to avoid this commitment problem. The first solution takes advantage of the community network. Although an exporter could establish long-term bilateral relations with a small number of suppliers in Antwerp, these relations would not be sufficient to satisfy his demand for rough diamonds, given the variation in the type of stones received by suppliers from one month to the next. What the network does is to diversify the supply of rough diamonds, with exporters who have established long-term relations with particular suppliers providing referrals for other members of their community. The set of exporters providing referrals will vary from one period to the next depending on the mix of stones received by the suppliers in Antwerp. Exporters thus draw upon different members of their community to provide referrals over time, expanding the set of suppliers that is available to them.

Exporters providing referrals have long-term relationships at stake and so will ensure that members of their community receiving the rough stones do not renege on their credit obligations. Exporters receiving referrals will not cheat, even if they do not expect to be helped by the same exporter in the future, if the threat of community-based sanctions is sufficiently severe (see Greif 1993, for a formal characterization of this equilibrium). Numerous accounts of the serious economic and social punishments faced by exporters who reneged on their obligations, on the few occasions when such transgressions did occur, would tend to support this characterization of the cooperative equilibrium.

Most exporters follow the strategy described above, building long-term relationships with a few suppliers in Antwerp, while using the community network to expand their access to rough diamonds. Other exporters operate independently, by setting up branches in Antwerp. Exporters who are based permanently in Antwerp also function as rough suppliers and so will interact frequently with other suppliers in the Antwerp market. These interactions and their permanent presence in Antwerp allow them to establish a reputation in the market, which serves as a commitment device and gives them access to rough diamonds from numerous suppliers without the support of a community network. We would expect the sons of businessmen, who have the wealth, connections, and skill needed to operate independently, to be most likely to establish branches in Antwerp. First-generation entrepreneurs will, instead, depend on the network.

Each potential entrepreneur will choose whether or not to enter the industry depending on the returns in the traditional occupation in his community (caste) and

the returns in the diamond industry. Returns to ability are greater in the diamond industry than in the traditional occupation, which implies that there is a threshold ability above which individuals select into the diamond industry in each entering cohort of each community. Returns in the diamond industry will, in addition, depend on the strength of the caste network for the first-generation entrepreneurs who choose to rely upon it. The key result of the model developed in Munshi (2011) is that (first-generation) business networks will strengthen more rapidly over time in communities with weaker outside options. By extension, the number of first-generation entrepreneurs will increase more rapidly in those communities, with an accompanying decline in the ability of the marginal entrant. In the diamond industry, potential entrepreneurs from the historically disadvantaged Kathiawari community would have weaker outside options than Marwaris or Palanpuris. Let each entering cohort consist of a fixed number of second-generation entrepreneurs who operate independently of the network. It follows that the fraction of first-generation entrepreneurs should have increased more rapidly over time among the Kathiawaris, consistent with the stylized fact described above. An additional implication of the model is that the ability of the marginal entrant should have declined more rapidly among the Kathiawaris over time. Using years of schooling as a measure of ability, this theoretical prediction is verified as well.

The marriage institution is central to the maintenance of a strong network. Given the particularly severe commitment problems associated with (risky) business activity, marriage alliances within specific industries are, in addition, commonly observed in business communities (Hazlehurst 1966). In my sample, 35 % of the entrepreneurs and 57 % of their children married within their caste and within the diamond industry. Providing direct support for the hypothesis that the Kathiawari network strengthened relatively rapidly, the frequency of intra-industry marriages increases steeply in that community over time. Almost none of the early Kathiawari entrants who established their firms before 1975 married within the industry. By 2004, however, 50 % of the entrants were marrying within the industry, surpassing the corresponding marriage rates for the Marwaris and Palanpuris, which remained roughly constant over time. Complementing this result, Kathiawari firms are less likely to establish branches in Antwerp, which would leave them less reliant on their network, and these community differences in organizational structure widen over time. Independent firm-level export data, obtained over a ten-year period for 95 % of the surveyed firms, indicate that these investments in the network translated into superior firm performance. The Kathiawaris keep pace with their more established rivals despite the decline in the inherited business background (and ability) of entrants from this community. Indeed, once this compositional change is accounted for with firm fixed effects, the Kathiawari export trajectory is significantly steeper than the corresponding trajectory for the Marwaris and Palanpuris, indicative of a rapidly strengthening network that would have improved outcomes for its members and supported inter-generational occupational mobility, precisely as predicted by the model.

2.5 Caste Networks and Restrictions on Mobility in Urban India

While caste networks can support the mobility of entire *groups* when conditions are appropriate, they can also restrict the mobility of *individual* members once they are established. The individual's participation in the network generates a positive externality, associated with the referrals that he will make and the support he will provide over the course of his working life. Self-interested individuals will not account for this externality when they decide whether or not to move into a new occupation. While restrictions on mobility might thus be welfare enhancing when they are first put into place, they could result in a dynamic inefficiency when the structure of the economy changes.

Labor market networks organized at the level of the caste or *jati* have found jobs for their male members, and supported the movement from the village to the city, for over a hundred years in Mumbai. It is consequently not surprising that particular castes came to occupy particular niches in the Mumbai labor market, although the urban occupations most often did not correspond to the traditional rural occupations. The upper castes gained access to professional and administrative jobs under the British, while the blue-collar jobs in the mills, the factories, and the docks were captured by lower castes.

Blue-collar jobs tend to be more heavily networked, both in developed and in developing economies, perhaps because it is more difficult to assess an individual worker's ability or effort in those jobs. For example, Rees (1966) found that informal sources accounted for 80 % of all hires in eight blue-collar occupations versus 50 % of all hires in four white-collar occupations in an early study set in Chicago. Similarly, 68 % of blue-collar workers and 38 % of white-collar workers reported having received help finding a job in Gore's (1970) study of migrants in Mumbai, which is very similar to the statistics Munshi and Rosenzweig obtained in their Mumbai survey during 2001–2002. Castes that gained access to the relatively stable blue-collar jobs tended to closely guard those jobs, passing them down from one generation to the next. Historical occupational patterns for males, by caste, under the British consequently persisted long after independence in 1947. However, the liberalization of the Indian economy in the early 1990s saw a shift in the city's economy toward the corporate and financial sectors. This resulted in a change in occupational patterns, as described below, but not without resistance from the well-established working class caste networks.

The schooling system in Mumbai, as elsewhere in India, allows the student to choose between instruction in English and the local language (Marathi in this case). In Mumbai, schooling in Marathi channels the child into a working class job, whereas more expensive English schooling increases the likelihood of obtaining a white-collar job in the future. While the parents of the children schooled in the 1990s were locked into their occupations when the economic restructuring occurred, Munshi and Rosenzweig (2006) assess the response by caste to the new

economic opportunities by studying whether parents enrolled their children in English or Marathi schools.

Munshi and Rosenzweig's empirical analysis is based on a survey of 4900 households belonging to the Maharashtrian community and residing in Mumbai's Dadar area and a survey of the schools in the locale that was conducted during 2001–2002. Secondary schools in Mumbai run from grade one to grade 10. The survey collected information on schooling choice for the 20 cohorts of students who entered the neighborhood schools (in the first grade) over 1982–2001 period. The time-series data on enrollments in English- and Marathi-medium schools suggest that the increase in the returns to English in the 1990s with the restructuring of the Indian economy significantly affected schooling choice. Enrollment rates in English-medium schools grew substantially over time for both boys and girls and for all castes, with a much steeper trajectory for the cohorts who entered school in the post-reform 1990s. The increase in the returns to English does appear to have shifted schooling choice toward English education.

Substantial differences in English schooling are observed across castes at the beginning of the sample period, reflecting in part the circumstances of the colonial regime. As noted, the high castes gained access to clerical and administrative jobs under the British, while the lower castes were confined for the most part to working class jobs. Consistent with the view that Marathi education channels students into working class jobs, and that English education increases the likelihood of obtaining a white-collar job, high-caste boys and girls currently of 25 years old (the oldest cohort) were much more likely to have been schooled in English, and this caste difference in schooling persists over the next 10 cohorts. Although the caste gap narrows dramatically for the girls in the 1990s as the returns to English increased, there is no convergence for the boys. We argue that this absence of convergence for the boys but not the girls—who were historically excluded from the working class networks—is indicative of restrictions on mobility.

In Munshi and Rosenzweig's model of occupational choice, the payoff in the networked working class occupation depends on the fraction of the community (caste) that selected into that occupation in the previous generation and can now provide referrals. The payoff (wage) in the white-collar occupation depends on individual ability. This implies that individuals above an ability threshold will select into the white-collar occupation, by enrolling in English-medium schools. The ability threshold will vary across castes depending on the occupational patterns that were historically in place and will remain constant across generations in steady state. This is consistent with the caste differences in schooling choice observed in the 1980s. Once the returns to the white-collar occupation start to grow in the new economy, however, the ability threshold will start to decline with an accompanying increase in the proportion of children schooled in English. If the increase in the returns to the white-collar occupation is sustained, and absent restrictions on mobility, Munshi and Rosenzweig show that schooling (and the future occupational distribution) will converge across castes. The wedge in schooling choice between upper caste and lower caste boys through the 1990s, even as the returns to English grew over this period, indicates that some force must be holding the lower caste

boys back. Consistent with this interpretation, we find at the individual level that the schooling decision for the boys, but not the girls, is determined by occupational choice in the *jati* in the previous generation, i.e., boys (but not girls) from working class *jatis* continue to be more likely to be sent to Marathi schools. This inter-generational persistence remains as strong for all the cohorts that entered school over the 1990s, despite the sustained increase in the returns to English schooling.

2.6 Caste Networks and Restrictions on Mobility in Rural India

While urban caste networks may have explicitly restricted mobility in Mumbai, networks could discourage mobility even when such restrictions are absent. Among developing countries, India stands out for its remarkably low levels of urbanization. For example, Deshingkar and Anderson (2004) note that rates of urbanization in India are lower, by one full percentage point, than countries with similar levels of urbanization, and that the fraction of the population that is urban in India is 15 % lower than in countries with comparable GDP per capita. Data from the Indian census indicate that just one-fifth of the growth in the urban population from 1991 to 2001, which was low to begin with, can be attributed to migration. Indeed, permanent migration of all types—including rural-to-rural and rural-to-urban—has remained low despite the restructuring of the Indian economy during the 1990s. The proportion of individuals in the population that changed residence in the decade preceding the 1991 and 2001 census rounds was roughly constant, and among these migrants less than a third were men seeking jobs. Consistent with these national trends, Munshi and Rosenzweig (2009) analyze a sample of Indian households drawn from all the major states in the country and find that in rural areas permanent migration rates of men out of their origin villages were as low as 8.7 % in 1999.

Why is internal migration in India so low? The explanation that we propose is that rural caste-based insurance networks restrict mobility because comparable arrangements are unavailable *and* because individuals who move away on their own lose the service of these networks. Using data from the 1982 Rural Economic Development Survey (REDS), Munshi and Rosenzweig provide support for the first part of this explanation. Loan terms—the proportion of zero-interest loans, the proportion of loans not requiring collateral, and the proportion of loans not requiring interest or collateral—are substantially more favorable for caste loans on average relative to other sources of credit. Among the caste loans received in the year prior to the 1982 survey, 20 % by value required no interest payment and no collateral. The corresponding statistic for the alternative sources of credit was close to zero, except for loans from friends where 4 % of the loans were received on similarly favorable terms. The India Human Development Survey (IHDS) does not provide information on collateral but does report whether a loan was interest-free.

Caste (extended family) loans are substantially more likely to be interest-free than loans from other sources, matching the corresponding statistics from the 1982 REDS survey. Loans from caste members are received on more favorable terms than loans from major alternative sources of finance in rural India. Given the severe rationing of bank loans, there is currently no comparable alternative to caste-based credit and insurance in rural (or urban) India.

Why are urban migrants excluded from rural insurance networks? Exclusion from social interactions serves as a natural mechanism to support cooperation. Once an individual migrates, these interactions with members of the rural network will be less frequent and less important and so its ability to punish him will decline. A standard result from the repeated games literature is that if punishments are set to zero and individuals are sufficiently impatient, cooperation cannot be sustained. If this were applicable to our rural Indian setting, then each individual would be faced with two choices: (i) participate in the network but then forego the additional utility that comes with mobility, or (ii) out-migrate at the cost of losing the services of the network. Without access to market-based consumption-smoothing arrangements of comparable quality, most individuals appear to have historically chosen the first option and continue to do so today. This also provides an explanation for why historical migration in India has been associated with the movement of entire groups. The group can support its members in the city, and it can ensure that they do not renege on their rural obligations when they are away. At the same time, this means that opportunities for migration will be limited to those (infrequent) occasions when a large number of individuals can move together.

A direct test of the hypothesis that individuals forego mobility for superior insurance would be to assess whether *jatis* with better functioning insurance networks are associated with lower migration. Any attempt to implement this test must take into account the fact that network performance and migration are endogenously determined. In our view, there are no credible instruments for network performance that would allow us to implement this test. Our strategy instead is to look within the *jati* to identify (theoretically) which individuals benefit least from the insurance network. We then proceed to show (empirically) that it is precisely those individuals who are the least likely to migrate.

The model that we develop begins with the case where average incomes are the same across all members of the network. With full insurance, this implies that income will be pooled in each period and divided equally across all members. Now consider the case where some members have higher incomes. With concave preferences, a social planner interested in maximizing the total surplus generated by the insurance network will set the sharing rule so that higher income individuals end up subsidizing the rest of the network. The social planner will take account of the effect of this subsidy on overall participation because larger networks do a better job of smoothing risk. As long as urban opportunities are independent of rural wealth (income), the decline in participation by high-income individuals due to the subsidy will be more than offset by the increase in participation by low-income individuals, reinforcing the redistributive motivation for the subsidy. High-income individuals

will end up subsidizing low-income individuals in equilibrium, and so will be less likely to participate in the insurance network on average.

Munshi and Rosenzweig use data from the 1982 and 1999 rounds of the REDS to test the model's predictions. Controlling for the individual's own income, i.e., the absolute income effect, they find that individuals who are relatively wealthy within their *jati* are less likely to participate in the mutual insurance arrangement (giving or receiving gifts and loans) and to marry within the *jati*. At the same time, those individuals are most likely to migrate, providing support for the claim that the caste networks dampen mobility.

2.7 New Roles for Caste Networks

As we have seen, caste networks have supported economic activity in rural and urban India for centuries. These networks were originally formed to provide insurance to their members in the village. With urbanization and industrialization, they adapted their role to support rural–urban migration and to find jobs for their members in the city. Caste networks continue to support occupational mobility in the new Indian economy. Given the flexibility that caste networks have displayed historically, a natural question to ask is whether they could have extended their domain of influence from private economic activity to the public sphere with the recent expansion of local governments or *panchayats* in rural India.

The 73rd Amendment of the Indian Constitution, passed in 1991, established a three-tier system of local governments—at the village, block, and district level—with all seats to be filled by direct election. The village *panchayats*, which often cover multiple villages, were divided into 10–15 wards. *Panchayats* were given the power and the resources to make relatively substantial expenditures on public goods, and regular elections for the position of *panchayat* president and for each ward representative have been held every 5 years in most states. Given the novelty of these local political institutions, it is important to assess the quality of the leaders who have been elected. There are two dimensions along which the quality of political leaders must be evaluated in representative democracies: their *competence* and effort in bringing back resources for their constituency and their *commitment* or responsiveness to the preferences of the electorate. Munshi and Rosenzweig (2010) bring these two dimensions of leadership quality together by showing that political commitment, enforced by caste networks, results in the election of more competent leaders in the Indian local governments.

To illustrate the inefficiency associated with the absence of commitment, consider a local constituency (the ward in our context) in which a single political representative must be elected from among its residents. The elected representative must allocate a fixed level of resources (budget) to two public goods, sanitation, and street lights, in the constituency.

Individuals are heterogeneous in their preferences for public goods, and those elected are not accountable to the electorate, choosing their preferred policy,

measured by the mix of public goods, once in office. In a local election of this sort, it is straightforward to verify under reasonable conditions that the individual at the median of the distribution of preferences in the constituency will be selected in equilibrium. Now endogenize the total level of resources and allow individuals to differ on two dimensions—in their preference for different public goods and their political competence. Assume that these two characteristics are correlated such that more competent leaders (e.g., individuals with managerial experience), who bring back a larger budget allocation from the center for their constituency when elected, also happen to prefer larger expenditures on, say, street lights. The tension that arises when accountability is absent is that the pivotal median voter would like to elect the most competent individual in the constituency as the leader but at the same time is aware that the share of resources subsequently allocated to street lights will exceed his own preferred allocation. If the horizontal (preference) dimension of leadership quality dominates the vertical (competence) dimension, the median individual will continue to be selected as the leader in equilibrium. This is evidently inefficient, since everyone would be better off if the most competent individual was selected and he could somehow commit to selecting a mix of projects that was aligned with the preferences of the median individual.

In a well-functioning democracy, electoral competition will ensure that the efficient outcome is obtained. When the pool of potential leaders is limited and competition is restricted, as in a local election, the promise of re-election may still be sufficient to discipline the most competent individual *ex post* and, therefore, ensure his selection. And even when term limits weaken these electoral pressures, political parties supporting particular platforms (preferences) can discipline the candidates they put forward from one election to the next. None of these standard solutions are available in the Indian local governments. Each ward consists of just 70 households on average, political parties are largely inactive at the ward level, and caste reservation generates exogenous turnover in the pool of eligible leaders from one election term to the next. Based on the preceding example, mediocre leaders endowed with representative preferences could end up being selected in the Indian local governments. We argue that this may not be the case. In particular, we explore the possibility that caste networks could discipline the representatives they put forward as candidates, allowing more competent individuals to be selected in equilibrium.

To establish a role for the caste in disciplining its representatives, we would ideally want to compare the characteristics of elected council members and the level and mix of public goods across wards that are identical on all dimensions except for the involvement of castes in local politics. Caste networks are active throughout the country, and so this experiment is unavailable. What we do instead is exploit the system of caste reservation in Indian local governments, which randomly changes the set of castes within a ward that are eligible to stand from one election to the next. Based on a model of local representative democracy, this exogenous variation in who is eligible to run allows us to compare observed outcomes to the counter-factual outcomes that would have been obtained if castes exerted no influence in the wards.

The model, which draws on the citizen-candidate models of Osborne and Slivinski (1996) and Besley and Coate (1997), begins with the case where residents of the ward, heterogeneous in both political competence and in preferences for public goods, stand independently and are not accountable to the electorate once elected. As with the simple example discussed above, the first result is that the individual with median preferences in the ward will be elected unopposed in equilibrium. Next, we allow a group of socially connected individuals in the ward to put forward their most competent member. It is assumed that the threat of future punishment is strong enough to ensure that this individual will select a mix of projects aligned with the preferences of a pivotal member of the group when elected, even if he only expects to hold office for a single term. In the context of local Indian elections, the group is the caste. The second result of the model is that the caste representative will be elected if he is sufficiently more competent than the median individual in the ward, and the preferences of the pivotal member of the caste are sufficiently close to the preferences of the median individual. Under reasonable conditions, which we verify empirically, this implies that the caste representative will be elected when the population share of his group crosses a threshold level. A comparison of ward terms above and below the threshold thus provides an estimate of the role of the caste in increasing leaders' competence as indicated by the level of public goods.

The survey data that we collected describe the level and the mix of public goods, as well as the characteristics of all constituents and their elected council representatives, for three election terms in over one thousand wards covering the major Indian states. Consistent with the predictions of the model, we find that the level of public goods received by a ward increases discontinuously above a threshold share, with leadership characteristics plausibly associated with competence increasing discontinuously at that share as well. Assuming that this threshold share divides the sample into ward terms with and without leadership commitment, our estimates indicate that the caste network's ability to discipline leaders increases overall public good provision within a ward by 14–20 %.

A complete assessment of a leader's quality must be attentive to his choice of the mix of public goods and not just on the level of resources that he brings back to the constituency. Our theory tells us that the pivotal individual will shift from the median individual in the ward below the threshold to a pivotal individual in the most numerous eligible caste, who we assume has median preferences in that caste, above the threshold. Using this source of variation in the identity of the pivotal individual across election terms, we simultaneously estimate the effects of political commitment and the characteristics of the pivotal voter on the mix of public goods. In an alternative specification, we allow the characteristics of the elected representative to determine the mix of public goods. Below the threshold, these characteristics do as good a job of predicting the mix of public goods as the characteristics of the median individual in the ward, as they should. Above the threshold, however, they do not—we cannot reject the hypothesis that the council member's characteristics have no effect on the mix of public goods. The increase in

the level of public goods that is observed above the threshold is thus obtained without sacrificing the leader's commitment to his constituents (within the caste).

We find that the same characteristics of elected representatives that increase discontinuously at the threshold share, and are plausibly associated with leaders' competence (land wealth, occupation, schooling), also determine the mix of public goods. This suggests that the tension between voter preferences and the competence of the elected leader that underlies our model is an important feature of the local elections we study, highlighting the role played by the caste in enforcing political accountability. However, just as caste networks give rise to static and dynamic inefficiencies when they intervene in the economy, caste discipline in Indian local governments is the second-best solution. To begin with, the positive role for the caste that we document at the local level may not scale up. At the state and national level, multiple castes must form coalitions to compete successfully, appealing to a broader caste identity to win elections. The collective punishments that discipline leaders within castes do not cross caste lines. Without a mechanism to discipline leaders, parochial (caste) politics at higher levels of government could thus be associated with substantial inefficiencies, as documented by Banerjee and Pande (2007). Even at the local level, there are distributional consequences that are not necessarily benign. Because the elected caste representative is answerable to the social group he belongs to, his choices will be aligned with the preferences of a pivotal individual in his caste rather than the median individual in the constituency. Just as there is no substitute for well-functioning markets, there is no substitute for well-functioning political parties, which could put forward their representatives on a consistent policy platform, regardless of the reservation that was in place, from one election to the next.

2.8 Network Decay

Marriage within the community goes hand in hand with participation in the network. Just as individuals who migrate independently will lose the service of their rural insurance networks because they cannot be punished effectively, individuals who out-marry will also lose the service of the networks they are born into. Consistent with the view that caste networks remain active in rural and urban India, out-marriage among 25–40 year olds was as low as 7.6 % in Mumbai in 2001, 6.2 % in South Indian tea plantations in 2003, and 5.8 % for the rural population in 16 major Indian states in 1999. Moreover, marriage patterns in rural India have remained remarkably stable over time. Munshi and Rosenzweig (2009) report rates of out-marriage for the children and siblings of household heads over the 1950–1999 period, based on retrospective information collected in the 1999 round of the Rural Economic Development survey. Out-marriage is less than 6 % of all marriages and has remained stable for 50 years.

Networks will remain active unless market institutions of comparable quality become available, and this explains why out-marriage rates are so low even in

modern India. The only exception to the stable marriage patterns that I have uncovered consistently in my research comes from the Maharashtrian community in Mumbai. Recall that the restructuring of the Indian economy in the 1990s made the blue-collar networks that had traditionally supported this community less relevant. If out-marriage is tied to economic networks, then we should expect out-marriage in this community to have increased in the 1990s as the networks declined in importance. Using the parents and siblings of the sampled school children, Munshi and Rosenzweig find that out-marriage in Mumbai was extremely rare in the 1970s and 1980s (less than 5 %). In contrast with the stability observed elsewhere, however, out-marriage increased steeply over time in Mumbai, particularly in the 1990s, starting at 2 % in the early 1970s and reaching as high as 12 % by the late 1990s. The urban experience suggests that if the rural caste networks ceased to be salient because of the availability of new market insurance, out-marriage would increase and mobility could surge in rural India in the future as well.

When networks do start to decay, as in Mumbai, who are the first to leave? In Munshi and Rosenzweig's (2006) framework, returns to ability are greater in the white-collar profession than in working class jobs. Individuals above an ability threshold will select into the white-collar occupation, by enrolling in English-medium schools, with the threshold shifting down as returns to the white-collar occupation increase in the new economy. Using father's years of schooling as a predetermined proxy for the student's ability, Munshi and Rosenzweig verify that exit from the traditional occupation and the network that supports it occurs from the top of the ability distribution within each *jati*. In Mumbai, variation in the propensity to exit across individuals is determined by their opportunities outside the network. In rural India, Munshi and Rosenzweig's (2009) analysis indicates that relatively wealthy individuals within their *jati*, who subsidize the rest of their network, are most likely to leave. In general, individuals who benefit the least from their networks and those who gain the most from new market opportunities will be the first to exit when networks start to decay.

Apart from the most able individuals, and relatively wealthy individuals, the preceding discussion tells us that women—who were severely disadvantaged in the traditional economy—should also have a greater propensity to exit caste networks. As discussed earlier, the caste gap in English schooling for boys in Rosenzweig and Munshi's Mumbai study persisted through the 1990s, even as the economy restructured and new employment opportunities opened up. Our explanation for this absence of convergence is that castes might have placed tacit restrictions on the occupational mobility of their members to preserve the integrity of traditional blue-collar networks. However, such restrictions would only have applied to the boys. Female labor force participation was relatively low in Mumbai, and when women did find jobs, they tended to be in less-networked occupations. In contrast with the patterns that we observe for the boys, the caste gap for the girls narrows dramatically in the 1990s. The lower caste girls take full advantage of the opportunities that become available in the new economy. The growing disparities in schooling choice between boys and girls in the traditionally working class *jatis* not only suggest a new balance of economic opportunities by gender, but also could

threaten the long-run stability of caste networks that are based on endogamous marriage within the *jati*.

Luke and Munshi (2011) similarly find that women lead the move out of traditional caste networks in their analysis of tea plantation workers in the South Indian High Range. The High Range, a mountainous area straddling the modern Indian states of Kerala and Tamil Nadu, was virgin forest until it was acquired by British planters and converted into tea plantations in the last quarter of the nineteenth century. Since the plantation land was previously uninhabited, workers were brought to the High Range from the plains in Tamil Nadu. Today, the workers on the tea plantations—or “estates”—are the third-generation descendants of those migrants, whose population is supplemented by a fresh influx of new workers from the “low country” in each subsequent generation through marriage. Women work primarily as tea-leaf pluckers on the estates, whereas the men are employed in supporting tasks such as weeding, spraying, and pruning, as well as in the estate tea factories.

The workers in the High Range continue to be tied to their ancestral communities in rural Tamil Nadu, despite having lived in the tea estates for many generations. Loans and transfers flow back and forth between the tea estates and the origin communities; the children of the workers are often sent home to study; and many workers will buy land, build a house, and return to their ancestral homes when they retire. Perhaps the most distinctive feature of South Indian kinship structure is marriage among close relatives. Reinforcing existing network ties, many workers continue to marry their children to relatives from the ancestral location in the traditional fashion.

The key parental decision is the extent to which children will be tied to their ancestral communities and the traditional caste network. This decision will, in turn, determine the probability that children will marry among their relatives as well as their educational attainment. Women living in the tea estates have permanent full-time jobs over their working lives and they actually earn more than men on average. They enjoy relatively high social status in the tea estates as the primary breadwinners in their households and so the prospect of permanently settling in their traditional ancestral communities when they retire will be especially burdensome for them. While both men and women might benefit from mutual insurance, old age support, and other forms of assistance organized around their caste networks, the cost of maintaining the social ties that are necessary to obtain this social support may be substantially larger for the women than the men. This implies, in turn, that they will have a greater incentive to invest in their children’s human capital, weaken ties with their ancestral communities, and move their families from the traditional to the modern economy.

To test this hypothesis, Luke and Munshi surveyed 3700 female workers, employed by a single tea manufacturing company and residing in 23 estates, in 2003. Annual incomes for the workers and their husbands were obtained over the 1997–2001 period from the company’s administrative records to supplement the information collected from the survey. Conditional on total household income, an increase in female income weakens the family’s ties to the ancestral community (caste network). The children are less likely to marry a relative, to be schooled in the

ancestral location, and to ultimately settle there. At the same time, an increase in relative female income increases the educational attainment of the children. While these results are consistent with the hypothesis that women have a stronger incentive to move their families out of the traditional caste networks, and higher relative income allows them to act on these preferences, it is worth noting that large and statistically significant female income effects are obtained for the lower castes alone. This could be because the prospect of settling in the ancestral community after retirement is especially burdensome for lower caste women or because they have the ability to act on their preferences. Regardless of the explanation, Luke and Munshi's findings in the tea estates echo Munshi and Rosenzweig's results from Mumbai, with (lower caste) women emerging as agents of change in the new economy.

2.9 Conclusion

Caste continues to play an important role in modern Indian life. One explanation for this persistence is based on the role played by caste networks in supporting economic activity. Rural caste networks historically provided insurance for their members. With the arrival of the British and the growth of cities in the nineteenth century, these networks expanded their role to support rural–urban migration and to find jobs for their members in the city. Caste networks continue to be active in the Indian economy, supporting the movement of entire groups into new occupations, including business. Indeed, they appear to have recently expanded their domain from private economic activity to the public sphere, disciplining the representatives they put forward and allowing more competent leaders to be elected in equilibrium.

Although caste networks may provide many useful services for their members, there is no substitute for well-functioning market institutions. Trade cannot cross social boundaries in a network-based economy, resulting in the misallocation of factors of production. Once they are established, networks can also restrict the mobility of individual members. Apart from these economic inefficiencies, there are many social and political reasons why it is important to dismantle the caste system. But this system and the institutions it supports will retain their relevance until the market begins to function efficiently. As we saw in Mumbai, it is growth and new economic opportunities that will ultimately lead to the demise of the caste system.

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