MARRIAGE, NETWORKS, AND JOBS IN THIRD WORLD CITIES

Nancy Luke
Brown University

Mark Rosenzweig
Harvard University

Kaivan Munshi
Brown University and NBER

Abstract
This paper reports on recent research that explores the role of the marriage institution in facilitating economic activity in two urban labor markets: Kisumu, Kenya and Bombay, India. Kin and affine networks, organized around the marriage institution, are shown to improve the individual's labor market outcomes, while at the same time increasing his social obligations, in Kisumu. Caste-based networks, also kept in place by the marriage institution, are shown to shape career choices in Bombay. Although the marriage institution may have demonstrated a significant degree of flexibility in transplanting traditional (rural) networks to the city, we argue that these networks will ultimately break down in the face of economic globalization. (JEL: J12, J24, O12)

1. Introduction

Urbanization in the developing world is a relatively recent phenomenon, which has led to large migrant populations in most Third World cities. Taken together with the economic fluctuations that characterize developing economies, it is not surprising that labor markets in these cities tend to function imperfectly. In response to these imperfections, community-based networks have emerged throughout the developing world to facilitate economic activity.

This paper focuses on the role of one social institution, marriage, in sustaining labor market networks, based on recent work in two urban settings (Luke and Munshi 2003 and Munshi and Rosenzweig 2003). There is an extensive anthropological literature (Lévi-Strauss 1969, is the classic reference), which takes the view that marriage facilitates exchange in traditional network-based economies. Recent work has also shown that marriage plays an important

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E-mail addresses: Luke: nluke@brown.edu; Munshi: munshi@brown.edu; Rosenzweig: Mark_Rosenzweig@harvard.edu

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role in low-income rural areas in facilitating network-based risk-sharing (Rosenzweig and Stark 1989). We argue that this historical role for the marriage institution has been extended to the Third World city, where it reinforces and builds network ties, and improves labor market outcomes. In particular, we report findings on the relationship between marriage and male labor market outcomes in two very different settings: Kisumu, Kenya and Bombay, India. The analysis is restricted to men because labor participation rates for women have been, until recently, very low for women in Third World cities.

Marriage in much of Africa is exogamous, which implies that the individual cannot marry anyone from his clan or from clans that have been historically designated as "related." The individual is born into a network, usually organized around his father's family, and then enters into a new network, associated with his wife's family, when he marries. Thus, marriage in (rural) Africa was historically associated with entry into a new network. Marriage provides new sources of assistance for individuals, and an individual's marital status is then a salient determinant of job opportunities, given network characteristics. We show that this is true in our sample of men in Kisumu. In contrast, marriage in South Asia is endogamous; the individual can only marry within his subcaste, or *jati*. The individual is born into a network, organized at the level of the *jati*, and marries within the *same* network. Endogamous marriage thus sustains the network. But an individual's marital status has no structural effect on his labor market prospects. It is only the quality of the *jati*-wide network in which he is born that matters. Consistent with this view, we show that the historical occupation distribution in the marriage-based network defined by the *jati* plays an important role in determining career choices in Bombay, net of family characteristics. Endogamy thus strengthens existing network ties; exogamy builds new ones.[1] In either case marriage plays a key role in improving labor market outcomes when networks are active.

Although it appears that many communities have transplanted their traditional (rural) networks to the city, the question remains whether networks are sustainable in the face of exogenous economic change. Able individuals subsidize the other members of their network, providing accommodation and credit and finding jobs for them. If the returns to ability rise, as they might with the globalization of the world economy, it is possible that high-ability individuals will choose to avoid this ability "tax" even though they must bear the social sanctions that accompany defection from the network, ultimately leading to the break down of the current institutional arrangement. We present evidence that more able individuals avoid or defer their network obligations by marrying late in urban Africa. Similarly, we show evidence from urban India that suggests that increases in the returns to nontraditional occupations in which individual abil-

1. The gains from trade presumably dominated the benefits of improved enforcement in Africa, giving rise to exogamous marriage, whereas the opposite pattern must have been true historically in South Asia.

ities are rewarded is leading to an increased incidence of out-marriage that will ultimately break down the caste-based network.

2. Marriage and Jobs in Urban Africa

Kisumu is the capital of Nyanza Province, home to the Luo ethnic group. Parkin's (1978, p. 88) ethnography of Luo migrants in Nairobi describes how "A household head is subject to a barrage of requests for accommodation, many of them by job-seekers. All Luo who have 'spare' room in their houses are under some obligation to provide accommodation to a wide range of kin and affines [individuals related by marriage]." More recent work has also found that large proportions of Kenyan migrants live with kin or affines and assist these network members by paying school fees, providing housing, and job placement (Ocholla-Ayayo 2000).

Because assistance flows in both directions, we would expect in general that access to the affine network through marriage will improve the individual's labor market outcomes, while at the same time increasing his transfers to the extended family. To test this proposition, we estimate regressions of the form

$$y_i = \alpha + \beta M_i + X_i\gamma + \omega_i, \tag{1}$$

where y_i measures labor market outcomes, such as employment status and income, as well as transfers, for individual i. Here M_i measures marital status: $M_i = 1$ if the individual is married, $M_i = 0$ if he is single. X_i is a vector of observed individual characteristics, such as age, that directly determine the individual outcomes, and ω_i collects all the unobserved determinants of y_i, in particular the individual's ability.

The basic problem in identifying $\hat{\beta}$ is that high-ability individuals, endowed with traits such as confidence, entrepreneurship, initiative, and intelligence that result in superior labor market outcomes, have an incentive to defer marriage. This is because they incur greater social obligations when married (the ability tax). If high-ability individuals delay entry into the marriage market to avoid subsidizing the other members of their network, the probability of being married, $\Pr(M_i = 1)$, conditional on the individual's age, will be negatively correlated with ability ω_i. This will bias $\hat{\beta}$ downward. The standard solution to this statistical problem is to construct an instrument for marital status. The strategy employed in Luke and Munshi (2003) is to exploit traditional marriage rules among the Luo that generate frictions in the marriage market, leading in turn to exogenous variation in marriage prevalence across different parts of Nyanza Province.

The Luo are a tribe of Nilotic origin who migrated south into Kenya from Egypt and Sudan in three waves between 1490 and 1790. Although the rule of marital exogamy is the same for the entire group—no individual is allowed to

marry into a related clan—its effect on the matching process varies widely across Nyanza Province. The waves of migration generated large differences in the local level of relatedness across the Province, which continue to affect levels of marital prevalence today. Relatedness determines the efficiency of the matching process, and results from the 1989 Census indicate, as expected, that areas with a lower proportion of related clans are characterized by higher marriage prevalence, presumably because there are more eligible partners to choose from.

To test the relationship between marriage and individual outcomes in the city, new data were used from a survey of 2,300 male Luo migrants ages 21–45 that was conducted in Kisumu in 2001 (see Luke and Munshi 2003 for details of the survey and the analysis reported below). One advantage of this urban setting is that migrants in Kisumu are drawn from all over Nyanza Province, leaving sufficient variation in the relatedness instrument to estimate the marriage effect. But relatedness will only be an important predictor of marriage if the migrants continue to find their partners at home. Table 1, column (1) shows a strong negative relationship between relatedness in the origin location and marital status among the "late" migrants in the sample (those who arrived in Kisumu as adults). Late migrants are more likely than "early" migrants (who arrived as children or adolescents) to be married before they arrived in Kisumu, and they also maintain closer ties with their original location after migrating. The link between relatedness and marriage is absent for the early migrants.

Table 1, columns (2–7) report estimates of the effect of marriage on the number of months employed in the year, log(annual income), and remittances (as a proportion of total income) to the family at home, restricting the sample to late migrants. Additional regressors include the individual's age and the region in Nyanza Province that he belongs to; South Nyanza is relatively isolated whereas Central Nyanza is better connected to Kisumu and the rest of the

TABLE 1. Marriage, labor market outcomes, and remittances

	Marital status	Employment		ln(Income)		Remittances	
Dependent variable	First stage	OLS	IV	OLS	IV	OLS	IV
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Relatedness	−0.064	—	—	—	—	—	—
	(0.019)						
Marital status	—	2.934	11.114	0.487	1.469	7.608	39.487
		(0.315)	(3.309)	(0.083)	(0.794)	(1.094)	(22.245)
R^2	0.211	0.188	—	0.112	—	0.050	—
Number of observations	1,061	1,061	1,059	1,009	1,007	996	994

Notes: Standard errors are in parentheses.
Standard errors are robust to heteroscedasticity and clustered residuals within each traditional location.
Marital status = 1 if currently married, 0 otherwise.
Employment is measured in months, income in thousands of Kenyan shillings, and remittances as the percent of annual income.
All regressions include the individual's age and the region of origin as additional regressors.
Column (1) is estimated as probit regression. Predicted marital status from the first stage is used as the instrument in IV regressions.

country. Entry into the marriage institution improves the individual's labor market outcomes and increases his social obligations: The marriage effect is positive and statistically significant at the 5% level in all the OLS regressions as well as the employment instrumental variable (IV) regression. It is positive and significant at the 10% level in the income and remittances IV regressions.[2]

As expected, if able individuals are deferring marriage, the IV point estimate is larger than the corresponding OLS estimate for each individual outcome in Table 1. Consistent with this interpretation, Luke and Munshi (2003) show that individuals with observed characteristics that are correlated with high ability are more likely to be employed, have higher income conditional on being employed, and are less likely to be married at any given age. These behavioral patterns reflect a fundamental feature of the network, that high-ability individuals subsidize others, in this case the members of their wives' family networks when they marry, providing accommodation, job referrals, and financial support, while receiving (and needing) little help in return.

Luke and Munshi provide direct support for the presence of such an ability tax by showing that individuals with characteristics that are associated with high ability remit a greater fraction of their annual income to their families at home. The difference between the marriage effects in the OLS and IV remittances regressions is also indicative of such an ability tax, with low-ability men who are more likely to marry remitting a smaller fraction of their incomes and so biasing the OLS estimates downward. Almost all men must ultimately marry in this society in order to extend the lineage, but it is easy to see how high-ability men could postpone entry into marriage to avoid being inundated with requests for assistance from their affines.[3]

3. Networks and Jobs in Urban India

Bombay'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. 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. The presence of such recruitment networks has been documented by numerous historians studying Bombay's economy prior to independence in 1947 (e.g., Morris 1965,

2. Our instrumental variable strategy takes advantage of the fact that social rules often persist long after they have ceased to serve their originally intended purpose. Thus, relatedness continues to determine marital status among the migrants, even though any economic motivation for the local relatedness pattern at home when it was first put in place is unlikely to be relevant in the city today. Luke and Munshi (2003) provide indirect evidence that the relatedness instrument is valid and in particular that it influences the individual outcomes through its effect on marital status alone.

3. The sexual culture in sub-Saharan Africa, which places few restrictions on male nonmarital sexual activity before or after marriage, also reduces the cost of deferring marriage.

Chandavarkar 1994). The endogamous subcaste or *jati* served as a natural social unit around which to organize these networks because marriage ties strengthen information flows and improve enforcement. As Morris (1965, p. 76) emphasizes, "for any analysis of labor recruitment [in Bombay] . . . it is entirely inappropriate to lump into larger groups because of similarity of name, function, social status, or region-of-origin subcastes that are not endogamous."

To study the direct effect of the marriage institution on labor market outcomes in Bombay would require exogenous variation in out-marriage across *jatis.* Out-marriage weakens the network and hence should adversely affect the outcomes of all members of the *jati.* But out-marriage was extremely rare until very recently. Instead, we identify the presence of these networks, organized at the level of the endogamous *jati*, by testing whether the occupational distribution in the *jati* persists across generations net of an individual's own characteristics. We show formally in Munshi and Rosenzweig (2003) that such occupational persistence will be observed where job networks are active.

To test this prediction we take advantage of two features of the Bombay setting. First, children choose between English and Marathi (the local language in Bombay) as the language of instruction in school. The language of instruction is a good predictor of future occupational outcomes; schooling in Marathi channels the child into working class jobs, while more expensive English education significantly increases the likelihood of obtaining a coveted white-collar job. Second, it is commonly observed that working class occupations are associated with higher levels of networking (Rees 1966, Gore 1970). Although members of a single *jati* will in practice be engaged in many different occupations, the proportion of the members that received a job referral thus provides us with a simple statistic that measures the prevalence of working class jobs in the *jati.*

The empirical analysis is based on a survey of 4,700 households belonging to the Maharashtrian community and residing in Bombay's Dadar area that we conducted in 2001–2002 (see Munshi and Rosenzweig 2003 for details of the survey and the analysis that follows). The sample of households covers 59 *jatis*, and the schooling decisions for the 20 cohorts of children who were attending or had attended 28 of the 29 secondary schools in Dadar over the 1982–2001 period. Apart from the student's language of instruction, detailed information on parental occupation and income, as well as whether the parents received a referral from a relative or member of the community for their first job, was collected from each household.[4] Following the preceding discussion, we would expect children belonging to *jatis* with a historical preponderance of working class jobs, measured by a high level of job referrals, to be less likely to be

4. The 90 occupations reported in the data were classified for descriptive purposes into aggregate working class and white-collar categories. Consistent with the stylized facts noted above, working class parents are five times less likely to have been schooled in English. And, 68% of the working class fathers versus 44% of the white-collar fathers found their first job through a relative or member of the community.

schooled in English when networks are active. To test this prediction, we obtained estimates, by gender, of the relationship between the proportion of men in the *jati* of the student's family who received a job referral and the probability that the student was schooled in English, controlling for the parents' language of schooling. If networks are active, children in high-referral *jatis* should be more likely to enroll in local-language schools.

An identification problem arises if *jatis* differ in pre-school human capital, which would independently determine schooling choices. In addition, given imperfections in credit markets, liquidity constraints could prevent students from attending more expensive English schools and this determinant of schooling choice could vary across *jatis* with different levels of income. Thus, a traditionally working-class *jati* could be associated with a high referral rate and low parental income or schooling. In this case a family effect would be erroneously interpreted as a network effect because less able individuals with lower family resources independently select into Marathi schools.

One solution to this identification problem is to include parents' years of schooling and family income in the specification. An alternative solution exploits the fact that networks are concentrated in working class jobs dominated by men. Historical labor market participation rates were low for women in Bombay, and when women did enter the workforce they tended to occupy clerical or professional positions. Thus, although the (male) networks might affect schooling choice for the boys, they should have had little or no impact on the girls. By pooling the boys and girls, the schooling regression can be estimated with *jati* fixed effects, thus controlling for all differences across *jatis*. Use of *jati*-fixed effects thus provides a consistent estimate of the difference in the referral rate/schooling choice relationship between boys and girls. For the special case with exclusively male networks, the estimate of the interaction between gender and occupational persistence at the *jati* level identifies network-based occupational persistence for the boys directly. More generally, the coefficient provides a conservative estimate of the effect of caste-based networks on schooling choices for the boys.

Table 2 reports estimates of the relationship between the network-level referral variable and the choice of schooling language for boys (columns (1) and (2)) and girls (columns (3) and (4)) based on the estimates obtained in Munshi and Rosenzweig (2003). Column (1) reports the estimated referrals coefficient from a specification that includes the level of referrals, the student's cohort (to account for secular changes in the returns to English over time), and the parents' language of instruction in secondary school. The specification in column (2) includes parents' years of schooling and family income as additional regressors that capture unobserved ability. The referrals coefficient declines substantially from column (1) to column (2), but remains negative and significant at the 5% level in both regressions. The referrals coefficient is negative and significant with the parsimonious specification for girls (column (3)), but declines sharply

TABLE 2. Caste-based networks and schooling choice

Dependent variable	English schooling				
	Boys only		Girls only		Boys and girls
Sample	(1)	(2)	(3)	(4)	(5)
Referrals	−1.060	−0.377	−0.646	0.124	—
	(0.164)	(0.148)	(0.160)	(0.167)	
Referrals—boy	—	—	—	—	−0.398
					(0.091)
Additional regressors	No	Yes	No	Yes	No
R^2	0.173	0.274	0.146	0.272	0.163
Number of observations	2,405	2,286	2,228	2,093	4,635

Notes: Standard errors are in parentheses.
Standard errors are robust to heteroscedasticity and clustered residuals within each jati.
English schooling = 1 if the child is sent to an English school, 0 if he/she is sent to a Marathi school.
Referrals measures the proportion of fathers in the jati who received a referral.
Boy = 1 if the student is a boy, 0 if girl.
Column (1) and column (3) include cohort, parents' language of schooling as regressors.
Column (2) and column (4) also include parents' years of schooling, and family income as additional regressors.
Column (5) is estimated with jati fixed effects and includes cohort, boy dummy, and cohort-boy interaction as regressors.

when the additional family characteristics are included in the schooling regression in column (4), and is no longer statistically significant. These results imply that caste-based networks, net of individual and family characteristics, affect schooling decisions for the boys but not for the girls.

Column (5) reports the referral-boy interaction coefficient from the specification with *jati*-fixed effects, which takes into account any cross-*jati* heterogeneity. The interaction coefficient is negative and significant and very similar to the referrals coefficient for the boys in column (2). This is to be expected, as noted, when the referrals coefficient for the girls is zero, which from column (4) appears to be the case.[5]

4. Are Marriage-Based Networks Sustainable?

The results in Tables 1 and 2 suggest that the marriage institution plays an important role in sustaining labor market networks in two very different regions of the world. Thus the marriage institution has shown some flexibility by adapting to the new economy of the city. Nevertheless we expect that these marriage-based networks will grow less important in the future, with globalization of economies throughout the world.

The difference between the OLS and IV marriage effect for employment,

5. An alternative explanation for occupational persistence is that occupations get passed down at the family level, from father to son. Further, the identifying assumption in the fixed effects regression is that unobserved ability does not vary by gender within a *jati*. Munshi and Rosenzweig (2003) report additional robustness tests that investigate these alternative explanations and find that they cannot explain the *jati*-level persistence in occupational choice across generations among the men.

TABLE 3. Out-marriage and the language of instruction

	Proportion out-marrying			Difference with fixed effects
	English	Marathi	Difference	
Language of schooling	(1)	(2)	(3)	(4)
Sisters	0.33	0.10	0.23	0.17
(N = 596)	(0.07)	(0.01)	(0.07)	(0.07)
Brothers	0.30	0.09	0.21	0.09
(N = 195)	(0.09)	(0.02)	(0.09)	(0.09)

Notes: Standard errors are in parentheses.
Column (1) and column (2) compute proportion of married siblings that out-marry.
Column (3) computes difference in the proportions.
Column (4) computes this difference after controlling for jati fixed effects.

income, and remittances in Table 1 is suggestive, as noted, of negative selection into marriage, which is generated in turn by an ability tax in the network. The efforts by able men to avoid the obligations of marriage suggest that as the local economy takes on the characteristics of a modern economy in which there are high returns to individual ability, ability tax avoidance, and hence the level of selective marriage, will grow. In turn, there will be a corresponding decline in the quality of the network (which is populated by a steadily worsening pool of participants), and beyond some threshold the network must break down.

Network deterioration is not yet evident in Kisumu, perhaps because the local economy has stagnated in recent years. But there are signs that Bombay's caste-based networks are starting to break down in the face of the globalization that transformed the Indian economy over the past decade. Although Bombay was a predominantly industrial city for a hundred years, starting from the last quarter of the nineteenth century, the liberalization of the Indian economy in the 1990s saw a shift in the city's economy towards the corporate and financial sectors. Munshi and Rosenzweig (2003) show that the returns to English schooling increased sharply in the 1990s, which generated a corresponding shift into English as the language of instruction among children entering school in that decade.[6]

As noted, English education leads to white-collar jobs, which are less networked. The dramatic shift into English among the school-going children indicates that the importance of the network might be severely reduced for the next generation of workers. Reinforcing the decline in the size of the network will be the out-marriage that inevitably accompanies English schooling and will ultimately undermine the caste network. Table 3, Row 1 reports the proportion of married sisters (who are far more numerous than the married brothers given the age-selection of the sample) who married outside their *jati* by type of school. As can be seen more than three times as many English-schooled women married

6. Among the entering students, the proportion of boys attending English schools increased from 22% in 1990 to 41% in 2001. For girls, this proportion increased from 23% to 48%.

outside the *jati* (33%) than Marathi-schooled women (10%). This difference is statistically significant at the 5% level, and remains large and significant when we control for *jati* fixed effects. The out-marriage statistics for the married brothers in Table 3, Row 2 are very similar. These findings and the rise in English-medium schooling—a response to the opportunities of the new, post-reform economy—suggest that the endogamous caste system, which has remained firmly in place for thousands of years, may be starting to disintegrate.[7]

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7. Among the 792 married siblings of the students in our sample, 11.8% married outside their *jati.* This contrasts with the parent generation in which only 3.6% of the partners were not members of the same *jati.*