

Should I Stay or Should I So: Geographic Versus Cultural Networks in the Migration Decision

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**- PRELIMINARY -
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1. INTRODUCTION

Over two million people from Kerala, India—almost 10 percent of the state’s labor force—are living and working in a Gulf country. They are *willing* to go because the Arab Gulf is like a “modern-day El Dorado” for many of them. They are *able* to go because they can depend on the support of a strong network of people to provide them with the resources and information they need to emigrate.

The network theory of migration posits that international migration maintains itself through social networks—interpersonal ties in the home and host country (see Massey, *et al.*, 1998b). Empirical work on migrant networks most often assumes that an individual’s probability of emigration will increase with the size of his “geographical network,” or the proportion of emigrants from his locality (in this case, the Panchayet).¹ But, Kerala’s migrants do not depend on the emigration experience of all the people in

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¹ A Panchayet in India is considered a municipality and often has its own governing body of elected representatives from the community. Although Panchayets are often considered villages, there may be several Panchayets in large cities.

their Panchayet, but rather the people who they know: family, friends, and acquaintances. The common characteristic of their networks are not geographic but religious; social contacts are determined by religion and in Kerala, like the rest of India, religion is a community identity that distinguishes social groups.

In this paper, we use the Indian state of Kerala as an interesting “laboratory” to study the formation of migrant networks and to measure the effect of religion-specific migrant networks on an individual’s migration probability. In our analysis, we also distinguish the mechanism through which the network effect operates. Networks offer two types of help—information and financing.² After identifying the relevant network, we show that migrant networks are primarily informative and destination-specific.

Using religion to define a community’s network has three main advantages. First and foremost, religion identifies a well-defined and well-established social group which helps to overcome one of the main challenges for empirical work regarding migrant networks: the problem of “peer effects.” Unlike ancestry or language, we believe that religion is an exogenous and relevant measure of the social links among groups in Kerala. The second advantage to using religion to define community networks is that this variable addresses the issue of self-selection because members of a religious group do not “choose” their religion today. The emergence of Hinduism, Christianity, and Islam in Kerala dates back to the first century A.D.³ And finally, the third advantage to using religion and geography to identify a social group is that these variables provide variation within localities and religious groups.

The empirical results presented in this paper are both econometrically and economically significant. First, the results of this study demonstrate that the relevant network determining an individual’s probability of emigration is his own religious network, what we call the *own network effect*. The own network effect is measured by the interaction of our measurement of the religious network with the individual’s own

² In the context of migration, information can be channeled in a number of ways: information about migration that can reduce the costs of migration (which agents, which documents, which airline, etc) and information about the destination that can increase the benefits of migration (job availability, assimilation strategies, housing options).

³ Early Hinduism can be linked to the decline of Buddhism and a process of “Aryanization” in the state during the fifth and sixth century A.D. The development of Islam can be traced back to contacts with Arab traders in the eighth century A.D. And the beginnings of Christianity are credited to Saint Thomas the apostle, who allegedly came to the state in the first century A.D (see Menon, 1982; Kurien, 2002).

religion (i.e. *Christian network*Christian, Muslim network*Muslim, and Hindu network*Hindu*). In fact, we find that religious networks are ten times more powerful than geographic networks in predicting the probability of emigration for their own members. The second main finding from our regressions is that these networks provide country-specific and time-sensitive information, rather than financing, to potential migrants. As such, migrant networks channel the networks' members to specific locations.

Our findings have both theoretical and practical importance. Theorists should care because we need a more specific model of migrant networks in order to better understand the migration decision of households and individuals. At the same time, policy practitioners can incorporate the use of migrant networks for targeting programs. For example, an effective targeting program that helps some members of the group to migrate—like job training programs prior to emigration—will directly affect targeted individuals and indirectly help other members of the group through multiplier effects if the relevant network has been identified. The converse should also hold true and may become increasingly important as the debate over the brain drain continues and countries attempt to impede or discourage high-migrant groups from leaving. The mechanism by which a network operates also has different policy implications given that programs which seek to manage migration should know whether networks offer information, assistance, or financing.

The paper is structured as follows. In the next section we describe the institutional setting and context for the study. *Section 3* briefly reviews the literature on migrant networks. In *Section 4* we describe our conceptual framework and empirical methodology. Then, *Section 5* describes the data and provides basic summary statistics for the sample population. In *Section 6* we present the estimation results. And finally, *Section 7* concludes.

2. THE LABORATORY: KERALA, INDIA

2.1 Kerala's Gulf Connection

In 2003, 1.84 million Keralites—eight percent of the state’s total labor force— were living and working in a Gulf country (see Zachariah, K.C., Mathew, E. T., & Rajan, S. I., 2004c, p.4).⁴ & ⁵ Gulf migration is unusual in that it is exclusively temporary (migrants are called “guest workers”) due to restrictive immigration policies enacted by the countries in the Gulf Cooperation Council (GCC) which prohibit permanent resettlement of foreign nationals (Massey *et al.* 1998b, p.135). The fact that Gulf migration is temporary means that an estimation of the stock of migrants in any given year under-represents the pervasiveness of migration in Kerala’s society.

Kerala’s present-day Gulf migration began to surge in 1973 when the sudden increase in oil prices set off a rapid process of urbanization in the Arab Gulf.⁶ The Gulf countries, which faced a shortage of qualified local labor, sought foreign labor to satisfy their construction boom. Kerala’s history of trade with the region and a large surplus labor force due to the state’s “stagnant productive sector” resulted in several important “pull” and “push” factors that motivated migration (Zachariah, *et al.* 2001a, p. 78; see also Massey, D.S., *et al.*, 1998b, p.135; Weiner, 1982). By 1998, Keralites represented over 50 percent of India’s total emigration to the Arab Gulf (see Prakash, 1998).

The state’s geographical position gives it privileged access to the Gulf: Kerala is situated on 580 kilometers of coast at the south-western tip of India. Factors related to the state’s development experience, relative to other states in India, have also influenced these emigration patterns: the state’s population density, unemployment rate, and literacy rates are all very high by Indian standards.⁷ Thus, Kerala’s unemployed, but well educated, labor force was attracted to the employment opportunities that Gulf countries offered.

2.2 *The Religious Context*

⁴ This figure is similar to the estimations made by the State Planning Board of Kerala which determined the number of emigrants in 1997 to be 1.6 million people.

⁵ The figures presented in this section are the author’s own calculations from the Kerala Migration Study (KMS) and South Asia Migration Study (SMS) conducted in 1998 and 2003 respectively.

⁶ In 1973, a conference among GCC countries led to an agreement which formed an oil cartel that drove up the price of oil. By 1974, the price of oil had quadrupled (see Massey *et al.* 1998, p. 137).

⁷ Kerala’s literacy rate is the highest among Indian states. According to the 2001 census, Kerala had a literacy rate of 91 percent.

Compared to the rest of India with a Hindu majority population (80.5 percent), Kerala is unique in that it has sizeable Muslim (24.7 percent of Kerala's population) and Christian (19 percent) populations in addition to its Hindu (56.1 percent) majority.⁸ There is also sufficient ethnographic data to suggest that social networks in Kerala have been created and are maintained within religious circles (see Kurien, 2002; Osella and Osella, 2000).

A distinguishing characteristic of Kerala's Gulf migration is its religious dimension. While Muslims make up only one fourth of Kerala's total population, they represent one half of the total emigrant population.⁹ In other words, 13 percent of the total Muslim population was a current emigrant in 1998, compared to only three percent of the Hindu population and six percent of the Christian population.

Prema Kurien, one of the first sociologists to do a comprehensive ethnographic study of Kerala's migration patterns, describes the Hindu, Muslim, and Christian communities in Kerala as different *ethnic* groups because of dissimilarities in marriage, inheritance, family structure, education, and gender norms (2002: 2). The notion that Kerala's religious groups are ethnically different, despite a common ancestry and language, implies that these three religious groups are not only different in terms of religious doctrine, but also in terms of their culture.

3. LITERATURE REVIEW

The sociological literature has delved into the study of social networks more than the economic literature, and as a result network theory moves away from a purely economic understanding of migration decisions. A migrant network can be defined as "sets of interpersonal ties that connect migrants, former migrants, and nonimmigrant in original and destination areas through ties of kinship, friendship, and shared community origin" (Massey *et al.*, 1998, p. 43). Empirical research most often measures the migrant network as the proportion migrants from a specific geographic area (see McKenzie, 2005; Massey, Goldring, and Durand, 1994). In other words, a "home network" is determined

⁸ "Data on Religion," Census of India, 2001.

⁹ Table A.2 shows that 50 percent of Gulf emigrants were Muslim in 1998

by the number of migrant divided by the total number of individuals in the origin community. Similarly, Munshi (2003) measures the “destination network” as the proportion of sampled individuals from a specific origin community in a particular destination. These methodologies suggest that the “quantity” of networks matter most, or what Bertrand, *et al.* (2003) call “contact availability.” In this paper we test the relevance of both home and destination networks but move away from the assumption that networks operate at an aggregate, geographic level.

There are several drawbacks to the assumption that the relevant social unit, and thereby network, is geographic in nature. First, treating an entire geographic community as the relevant social unit assumes that contacts are randomly distributed within that geographic area which may not be true. And second, this assumption fails to account for the fact that *access* to migrant networks, like social networks, can be restricted by the relevant social group. There are many characteristics of a social unit (such as the cohesiveness, solidarity, and exclusivity, trust and loyalty of its members, social ties and family structure, gender norms, human and social capital, and the beliefs and ideology of the community) that inadvertently affect the way in which networks arise and operate. And finally, using the geographic network as the default model means that researchers will predict an individual’s probability of emigration using a “typical” network rather than a specific network. As such, network theory does not take into account how migrant networks can differ in “quality” and by its social group.

Few empirical studies consider how networks may vary by community or individual characteristics, such as ethnicity, religion, or gender. Curran and Fuentes (2003) find that the gender composition of migrant networks affects the emigration probability of male and female migrants differently. Borjas (1992b) uses the average skill of ethnic groups of the previous generation (what he calls “ethnic capital”) as a way to measure the effect of social networks on the current generation’s welfare.¹⁰ Bertrand *et al.* (2000), however, point out that Borjas’ methodology does not account for either

¹⁰ Borjas also relies on self-reported ethnicity for immigrants (first, second, and third generation) to define ethnic groups, but his assumptions may be problematic if ethnic groups classified as “Black” and “White” or even “African American” and “Caucasian” in the United States are not the main social networks on which immigrants rely. For example, second generation immigrants may be more likely to identify with their class group, rather than their “ancestral” group. Furthermore, Logan, Alba, and McNulty. (1994) argue that ethnic enclaves in destination countries are difficult to create and therefore study.

omitted personal or ethnic community characteristics that could be correlated with his ethnic capital measurement.

Fewer studies also look at the mechanisms by which migrant networks operate. Yet, the literature describing the role of social networks in the labor market is extensive (see Montgomery, 1991; Munshi, 2003). Borjas (1992) predicts that network effects are much stronger for migrants because they are new to the labor market and the evidence supports this hypothesis (see Munshi, 2003; Menjivar, 2000; Zhou, 1992; Gottlieb, 1991). Communities that are more networked, according to Carrington *et al.* (1996), should have a greater likelihood of employment at destination and also a higher steady-state level of migration. Massey *et al.* (1987) show that Mexican return emigrants provide information about the US labor market to potential emigrants in their home communities. Similarly, Munshi (2003) also shows that networks inform new migrants about jobs at destination.

If the migration decision is a simple cost-benefit analysis on the part of the migrant or migrant household, then networks increase the net benefits of this calculation by lowering the costs and risks—financial, informational, and psychic—of migration (McKenzie, 2005; Munshi, 2003; Winters *et al.*, 2001; Ilahi and Jafarey, 1999; Schwartz, 1973). Indeed, Nair (1998) finds that a third of return migrants in Kerala reported having acquired a loan from friends or family to finance migration costs.

Destination networks—as a system of referrals—are applicable to a simple principal-agent problem (see Montgomery, 1991; Rees, 1966). If we assume that experienced migrants have more information than an employer about the ability or skills of other members in their networks, then their referrals would be valuable to the employer and will increase other network members' employment opportunities.¹¹ A number of studies find that the cost of migration decreases with the number of migrants in the destination country because destination networks provide new and potential migrants with information about employment and employers (Carrington *et al.*, 1996;

¹¹ At the same time, a stronger destination network can be disadvantageous if network members make referrals and offer employment information only for a specific occupation. This “limitation” of networks may help explain why half of Kerala's emigrants become manual laborers in the Gulf while only a third reported being a manual laborer prior to emigration. Of course, one could argue that manual labor is simply the only job available and that we must consider this disadvantage in terms of the alternative: unemployment at home.

Borjas, 1992; Massey, 1988; Boyd, 1989; Menjivar, 1995, Munshi 2003). Two studies on Kerala's migration find similar results (see Nair, 1998; Sekhar, 1997).

A body of sociological literature claims that home and destination networks can also have a number of social and psychological effects as well (see Massey *et al.* 1998; Gardner & Osella, 2004). For example, home networks can influence cultural attitudes regarding migration and thereby affect a household's personal "cost-benefit" analysis (see Bookman, 2002). At destination, Choldin (1973) finds that destination networks reduces the "assimilation shock" for new arrivals.

The economic literature that studies migrant networks, however, is confronted with several empirical challenges. The main econometric challenge to network analysis is identifying the direction of the causal relationship between migrant networks and the migration decision because of the problem of peer effects. Peer effects confound the interpretation of the network effect because shared community characteristics can influence the migration decision but may be unobservable (see Massey, D. S., *et al.*, 1993; Boyd, 1989). Manski calls this the reflection problem. In econometric terms, the reflection problem is a problem of omitted variable bias.

Another concern for an econometric analysis is that access to the migrant network may be endogenous to the household's own emigration experience (see Orrenius, 1999). In other words, an individual's emigration probability may be a product of his household's or kin's prior emigration experience rather than the migration of other individuals in his network (see Taylor 1987; McKenzie and Rapoport, 2005). One way to isolate the network effect is to limit our analysis only to new migrants who are temporarily exogenous to the network (see Orennius, 1999; Zhao, 2001).

Empirical studies of migration have also attempted to address these serious challenges of endogeneity in other ways. To control for time-invariant community or individual characteristics, studies have included community fixed effects (see McKenzie and Rapoport, 2005; and Winters, *et al.*, 2001) and individual-level fixed effects (see Munshi, 2003; and Orrenius, 1999) respectively. Some studies have even been able to find reliable instrumental variables, such as rainfall data or historic state-level migration rates, to address these econometric challenges (see Munshi, 2003; Giles and Yoo, 2005; McKenzie and Rapoport, 2005; Woodruff and Zentano, 2001).

4. EMPIRICAL METHODOLOGY

As the previous discussion notes, migrant networks can be measured both at home and at destination. In our empirical framework, we first measure the geographic and religious network at home to show the network effect on an individual's probability of emigration. Then, we measure the religious network at destination to show how information can be transferred from host country to home. And finally, we define occupation and destination-specific networks to show how religious networks channel information about specific jobs and particular locations to emigrants.

4.1 Migrant networks at home: The emigration decision

4.1.1 The effect of geographic networks

To test the hypothesis that emigrant networks increase the probability of emigration, we estimate the following equation to predict whether individual i in Panchayet p in time period t emigrates using a probit model. We prefer the probit model because the dependent variable, *Emigrate*, takes on only two values (emigration or no emigration) and this model is most traditionally used to fit data describing a dichotomous decision. The equation can be described as:

$$[1] \Pr(Emigrate_{ipr}) = \beta_0 + \beta_1 Rel + \beta_2 Netw_{(t-1)} + \beta_3 Netw_{(t-1)}^2 + \beta_4 REMNetw + \beta_5 REMNetw^2 + X + Y + Z + \varepsilon_{it}$$

where *Emigrate* is an indicator variable equal to one if the individual undertakes emigration and zero otherwise; *Rel* is a set of dummy variables indicating the individual's own religion which accounts for the similarities within the Christian and Muslim communities relative to Hindus;¹² and *Netw* refers to the "geographic network" and is the proportion of adult males between the ages of 16 and 45 who are current emigrants from

¹² We omit the dummy indicating that the individual is Hindu so that the coefficients on the Muslim and Christian dummies are interpreted relative to Hindus.

Panchayet p .¹³ In other words, $Netw$ can be measured as the total number of adult male emigrants from Panchayet p divided by the total number of adult males in Panchayet p . $REMNetw$ refers to the “geographic network” for return emigrants (REM) and is measured as the proportion of return emigrant males in Panchayet p . The square of each network variable is also included to test whether migrant networks have a non-linear effect on an individual’s probability of emigration. And finally, X , Y , and Z are control variables that are described in sub-section 4.3.

The sample of individuals included in this regression is restricted to adult males between the ages of 16 and 45 omitting current out-migrants from the sample. We also run equation [1] restricting the dependent variable $Emigrate$ to individuals from households without any prior emigration experience (i.e. no other emigrants or return emigrants in the household). In all regressions standard errors are clustered by Panchayet because networks are measured at the Panchayet level.¹⁴ Because the number of households in each sample (at the Panchayet level) was not adjusted to reflect the total number of households in the Panchayet, we weight all observations by the percentage of the Panchayet population represented by the sampled households.

4.1.2 The effect of religious networks

To test the hypothesis that the relevant network is religious, rather than geographic, we estimate the following equation to predict whether individual i in Panchayet p in time period t emigrates using a probit model as above:

$$[2] \quad \Pr(Emigrate_{ipr}) = \beta_0 + \beta_1 Rel + \beta_2 RelNetw_{(t-1)} + \beta_3 RelNetw_{(t-1)}^2 + \beta_4 RelNetw_{(t-1)} * OwnRel + X + Y + Z + \varepsilon_{it}$$

¹³ Although Winters *et al.* (2000) argue that migration networks encompass several villages or municipalities because kinship networks exist across space, we have chosen to measure networks at the Panchayet level because, if networks lower financial and informational costs associated with migration, then it is more likely that networks function at a proximate, if not intimate, level. The Panchayet level allows for closer and more frequent contact. Moreover, given our interest in religious networks, it is more likely that religious communities are more strongly defined at the Panchayet-level because community members frequent near-by churches, temples, or mosques.

¹⁴ As a robustness check, we also run equation [1] clustering standard errors by Taluk (which includes several Panchayets) to allow for correlation across Panchayets and the results remain robust.

As before *Emigrate* is a dichotomous variable indicating the individual’s choice to emigrate and *Rel* refers to a set of dummy variables denoting the individual’s religion. We define *RelNetw*, the measurement of the “religious network” as the proportion of adult males of religious group *r* who are emigrants from Panchayet *p*. For example, the *Hindu Network* would be measured as:

$$HinNetw = \left(\frac{\text{Total Hindu Male Emigrants}_p}{\text{Total Hindu Males}_p} \right)$$

We also include *RelNetw*OwnRel*, the interaction of the religious network with the individual’s own religion. While the variable *RelNetw* will capture the spill-over effects of religious networks on all individuals in the Panchayet, this interaction term captures the marginal effect of the religious network on the religious group’s own members—what we call the “own network effect.”¹⁵ In another regression we will further subdivide the religious network for Hindus to caste networks for the two largest Hindu castes represented in the survey, the Ezhavas and the Nairs.¹⁶

For equation [2] the sample and control variables are defined as before. We will also restrict the sample to first-time emigrants.

4.2 Migrant networks at destination

4.2.1 The effect of destination networks on the destination decision

As discussed, we are also interested in the mechanism by which networks operate. Networks can either provide information about migration or can finance migration costs. If networks are primarily informative then we should expect that destination networks, or the network of emigrants from Panchayet *p* in destination *d*, to channel other network members to the destination because their information is country specific.

¹⁵ All three religious networks are included in the regression because they are not collinear. As mentioned, each religious network is measured *within* the religious community so that for each Panchayet we are dealing with sub-sample populations that vary in size.

¹⁶ The caste system in Kerala was once one of the most virulent caste systems in all of India. In comparison to other castes in India, the Ezhavas would be considered as “other backwards caste” while the Nairs would be the equivalent of Brahmins, or higher caste.

To test this hypothesis we estimate the following multinomial model to predict whether individual i from Panchayet p in time period t emigrates to destination d . We use a multinomial logit model because the ethnographic information on Kerala's emigration indicates that the decision to emigrate and the decision of where to emigrate is simultaneous. In other words, when an individual wants to emigrate he will already have a destination in mind (most likely because he already has a strong network in that particular destination that can help to facilitate jobs, visas, and housing for him). This multinomial logit model can be described as:

$$[3] \quad \Pr(\text{Destination}_{ipr}) = \beta_0 + \beta_1 \text{Rel} + \beta_2 \text{RelDestinNetw}_{ipr(t-1)} + \beta_4 \text{RelDestinNetw}_{ipr(t-1)} * \text{OwnRel} + \mathbf{X} + \mathbf{Y} + \mathbf{Z} + \varepsilon_{it}$$

Where the dependent variable, *Destination*, takes on six values: equal to 1 if Saudi Arabia; equal to 2 if UAE; equal to 3 if Oman; equal to 4 if emigrated Elsewhere outside India; equal to 5 if internally migrated within India; 6 if no migration.

Again, *Rel* indicates a set of dummy variables for the individual's religion. *RelDestinNetw* refers to the "religious destination network" and is measured as the proportion of adult males from religious group r in destination country d from Panchayet p . Destination networks are measured for Saudi Arabia, the UAE, and Oman only because these three countries received more than two-thirds of all emigration in either survey year. The interaction term, *RelDestinNetw*OwnRel*, captures the marginal effect of the religious destination network on the religious group's own members while the non-interacted term, *RelDestinNetw*, captures the effect of the religious destination network on all members of Panchayet p . The control variables, X , Y , and Z , are defined as before.

This sample is restricted to adult males between the ages of 16 and 45 but includes current out-migrants since out-migration locations are also a simultaneous part of the migration decision. The standard errors are clustered by Panchayet and all observations are weighted.

4.3 Control variables

Control variables are included in all regressions. X are the observed personal characteristics of the sample individuals, Y are the observed household characteristics, and Z are the observed Panchayet characteristics. The individual characteristics include the individual's years of schooling and years of schooling squared, age and age squared, and a binary variable equal to one if the individual is married or unemployed. The household-level characteristics include a binary variable equal to one if the household has at least one return emigrant, a binary variable equal to one if the household has at least one out-migrant, a binary variable equal to one if there are multiple emigrants in the household, the family size, and the number of adult males above age 18 in the household. Family characteristics (family size and the number of adult males in the household) include the migrant since we are trying to capture the household's "pre-emigration" state. The data does not contain information on household income. To control for this household characteristic, we include an income proxy as the log of the total amount of land (wet and dry) owned by the household.

The Panchayet-level variables included are the average cost of migration for all migrants from the Panchayet, the average house quality of all households in the Panchayet rated on a scale of one to five (with one being very poor and five being luxurious), and a binary variable equal to one if the Panchayet is urban. The latter two variables may also proxy for the overall wealth and level of infrastructure in the Panchayet.¹⁷

5. DATA

The present study uses data from two linked household surveys conducted by the Center for Development Studies in Trivandrum, Kerala which covered a state-wide representative household sample: the Kerala Migration Survey (KMS) and the South Asia Migration Study (SMS). One of the main advantages of this study is that it exploits the

¹⁷ Panchayet fixed effects are not included in the probit models because including a set of Panchayet dummies would induce an incidental parameters problem (see Greene, 2002). An additional problem with including Panchayet dummies is that the emigration prevalence rates are all measured at the Panchayet level which would make these variables perfectly collinear with the Panchayet dummies.

panel nature of this data; half of the households surveyed in 1998 were re-surveyed in 2003.

The KMS was administered to the residents of 9,995 households selected from 200 Panchayats (villages) from 61 Taluks (counties) of each of the 14 districts of Kerala from March to December in 1998 (Zachariah *et al.* 2001a, p.64). Fifty households were selected at random from each Panchayet.¹⁸ The survey collected individual information about each member of the household, including members that had migrated, from the present head of the household at the time of the household visit.

The SMS survey, conducted in 2003, was designed to replicate the KMS and used the same questionnaire and a similar sampling methodology. The primary data for the SMS was collected from 10,012 households from 225 Panchayats, rather than 200 Panchayats as in 1998, from the 14 districts of Kerala (Zachariah *et al.* 2004c, p.12).

5.1 Summary statistics

Table A.1a and A.1b presents the main summary statistics for emigrants' characteristics by migration status and religion. The typical migrant is male, under 35 years old, and most often the spouse or married child of the current head of household. Emigrants, on average, have an extra year of schooling compared to non-migrants which suggests that emigrants are "positively selected." Within all three religious groups, emigrants were more educated than their non-migrant counterparts. However, there was significant variation in the educational attainments among Christian, Hindu, and Muslim emigrants, especially in 1998. In 1998, Christian emigrants had, on average, two more years of schooling compared to Muslim emigrants and an extra one-half year compared to Hindu emigrants. The educational gap between Christian and Hindu emigrants narrowed to less than a half a year difference in 2003, but persisted between Christian and Muslim emigrants.

Table A.1a: EMI & NMI Characteristics by Migration Status

1998

¹⁸ Because the number of households in each sample (at the Panchayet level) was not adjusted to reflect the total number of households in the Panchayet, we weight observations by the percentage of the Panchayet population represented by the sample households.

<i>Status</i>	Total Persons	Male	Mean Age at Emigration	Education	Married	Unemployed
EMI	2,099	91%	32.9	8.7*	49%*	26%*
NMI	26,560	45%	...	7.5	67%	9%
Total	52,544					

2003

<i>Status</i>	Total Persons	Male	Mean Age at Emigration	Education	Married	Unemployed
EMI	2694	83%	33.4	9.7*	41%*	33%*
NMI	27,273	45%	...	8.2	65%	14%
Total	52057					

*at emigration

Note: Emigrants (EMI); Non-migrants (NMI).

Note: Education refers to the mean years of education.

Source: Own calculations from KMS (1998) and SMS (2003) data.

Table A.1b: EMI Characteristics by Religion

1998

<i>Religion</i>	Total EMI	Male	Mean Age at emigration	Education	Married	Unemployed
Christian	432	79%	33.1	9.4	52%	22%
Muslim	1039	95%	32.7	7.5	53%	28%
Hindu	628	91%	33.2	8.9	41%	23%

2003

<i>Religion</i>	Total EMI	Male	Mean Age	Education	Married	Unemployed
Christian	675	68%	33.2	10.0	39%	43%
Muslim	1178	92%	32.7	7.9	44%	28%
Hindu	841	83%	34.5	9.7	39%	26%

*at emigration

Note: Emigrants (EMI).

Note: Mean Age, Education, Percentage Married, and Percentage Unemployed all denote values at emigration.

Source: Own calculations from KMS (1998) and SMS (2003) data.

Table A.2: Percentage of EMI, REM, and NMI by Religion

<i>Status</i>	Hindu		Muslim		Christian	
	1998	2003	1998	2003	1998	2003
EMI	27%	31%	50%	44%	21%	25%
REM	31%	34%	46%	42%	21%	24%
NMI	50%	57%	23%	25%	19%	19%
Total Population	46%	54%	27%	26%	20%	20%
<i>Census Population</i>	57%	56%	23%	25%	19%	19%

Note: Emigrants (EMI); Return Emigrants (REM); Non-migrants (NMI).

Table A.2 shows that Muslims represent nearly one half of the total emigrant population while Hindus represent about one-third and Christians represent one-fifth of total emigrants in 1998. One reason why Muslims are two times more likely than non-Muslims to emigrate is in part due to the fact that the overwhelming majority of Kerala's

emigrants go to the oil-rich Gulf (Table A.3 shows that 94 percent and 88 percent of emigrants went to a Gulf country in 1998 and 2003 respectively).

Table A.3: Percentage of EMI in Destination Countries

<i>Destination Countries</i>	1998	2003
Saudi Arabia	38%	27%
United Arab Emirates	31%	36%
Oman	10%	8%
Kuwait	5%	6%
Bahrain	5%	6%
Qatar	5%	5%
United States of America	2%	5%
Other	4%	7%
<i>Total Gulf</i>	94%	88%
<i>Total Other Region</i>	6%	12%

Note: Emigrants (EMI).

Source: Own calculations from KMS (1998) and SMS (2003) data.

Table A.3 shows that within Gulf migration, more than two thirds of all emigrants migrated to either the United Arab Emirates (UAE) or Saudi Arabia. There are the beginnings of a shift in emigration to non-Gulf countries between 1998 and 2003. In 2003, five percent of emigrants went to the United States, up three percentage points from 1998.

The choice in destination countries also varies by religion. Almost half of all Muslim emigrants went to Saudi Arabia in 2003 as compared to only one-third of Christian or Hindu emigrants. A significant percentage of Hindu emigrants went to Oman (14 percent) while a significant percentage of Christian emigrants went to Kuwait (10 percent) and the United States (8 percent) while just one percent of Muslim emigrants went to a country outside of the Arab Gulf.

In terms of occupations, one third of all emigrants are designated as manual workers while one fourth are still considered job seekers in the destination country. Roughly fifteen percent of emigrants are in the private sector, 13 percent are self-employed, and another 15 percent are in another occupational category. By country, the most prevalent occupation type for emigrants to Saudi Arabia, the UAE, and Oman are manual workers followed by private sector employment and then self-employment.

6. EMPIRICAL RESULTS

6.1 Network effects on the decision to emigrate

The probit results from equations (1) and (2) are interesting and significant in statistical and in economic terms. The probit results from equation (1) show that both geographic networks and return emigrant networks have an inverse U-shaped relationship with the probability of emigration for adult males. Once religious networks are incorporated, however, we find that geography is no longer the relevant criteria. The probit results from equation (2) reveal the Hindu network, the Muslim network, and the Christian network have small and insignificant coefficients, while the coefficients on the interaction terms (*MusNet* Muslim*, *HinNetw *Hindu*, and *ChrisNetw *Christian*) are much larger and statistically significant at the 1 percent level. These results imply that the Muslim, Hindu, and Christian networks significantly increase the probability of emigration for their *own* members while having a marginal and insignificant effect on all households within the Panchayet.¹⁹ We will refer to this effect as the “own network effect.”

The “own network effect” was strongest for the Hindu network and weakest for the Muslim network. This effect is also robust for the two major Hindu castes represented in the surveys—the Ezhavas and the Nairs.

When equations (1) and (2) are run for the sample of first-time emigrants only, we find that the results remain robust, but that the coefficients on the network variables (geographic and religious) decrease slightly in magnitude. This change in the magnitudes of the coefficients may reflect the fact that access to the religious network is partially dependent upon the household’s own emigration experience such that households with previous emigration experience are more active members of the network.

As shown in Table 1, we find that the geographic migrant and return migrant networks have a quadratic relationship with individual’s probability of migration—implying that at a certain size the network begins to discourage or dampen an individual’s

¹⁹ We measure networks at the Panchayet level for the reasons already mentioned. However, the small sample sizes of some Panchayet indicate 100 percent prevalence rates for migration. In order to ensure that these outliers are not driving our results, we run equation (2) after omitting Panchayets with 100 percent prevalence rates from the regressions to find that the coefficients on all the regressands, including the Muslim and Christian networks and their interactions, remain practically unchanged.

migration probability.²⁰ We also find that Muslim and Christian adult males are more likely than Hindu adult males to emigrate even after controlling for geographic networks.

The results in Table 2 support the finding that religious networks favor the religion's own members—the own network effect. In Table 2, when we include variables for the religious networks and the interaction of religious networks and the individual's own religion, we find that the coefficient on the Muslim dummy continues to be positive and significant, while the coefficient on the Christian dummy becomes insignificant. This change reflects the fact that religious networks do explain some of the variation in the emigration probability but Muslims are still more likely to migrate than non-Muslims.

Consistent with the theoretical literature on the determinants of emigration, certain individual and household characteristics (years of schooling, age, marital status, employment status, family size, number of adult males in the household) also influence the probability of emigration. The characteristics of the Panchayet are weak predictors of the household's emigration probability. The addition of these Panchayet characteristics do not significantly alter the coefficients on the variables of interest which leads us to believe that Panchayet characteristics are not driving these results.

6.2 *Network mechanisms*

6.2.1 *The effect of migrant networks on location decisions*

We find that the own network effect also translates to the destination decision, as seen in Table 3. For example, the Saudi Muslim network increases the probability of emigration of Muslims to Saudi Arabia but has a statistically insignificant effect on the probability of emigration for all other adult males in the Panchayet. The effect of the Saudi Christian and Saudi Hindu networks have similar results for Christian and Hindu males respectively. As we would expect, the UAE and Oman religious networks have the

²⁰ This non-linearity may be a function of “clustering” in the destination and it makes sense when considering that a larger network means more competition for the opportunity to migrate as well as more competition for jobs at destination. As another consequence of clustering, some empirical work finds that wages at destination decreases with the number of migrants thereby also decreasing the incentive to migrate (see Orrenius and Zavodny, 2005). The non-linear relationship is possibly related to the quality of the network such that as the network grows it becomes lower ability if less skilled migrants depend on the network as a means to migrate and find a job abroad. Thus, each additional migrant with lower ability may lower the average skill-level of the network as a consequence of his own migration.

same effect of channeling migrants of the religious group to these destinations. The own network effect remains robust even for the Hindu castes.

These results imply that destination networks are primarily informative because they are destination-specific because there is little spill-over from the UAE network on the emigration probability of males to Saudi Arabia. If destination networks were financing migration then we should expect a spill-over effect. But, if destination networks offer information about jobs, housing, or other assimilation strategies in the destination then we should expect and do find that the destination networks increase the emigration probability to the affiliated destination.

With the panel data we show that non-migrants in 1998 who emigrate by 2003 (new migrants) rely on the 2003 network, rather than the 1998 network, to emigrate. These results support the notion that networks are primarily informative since information relevant for emigration decays over time.

One concern for the measurement of network effects is that all households within a Panchayet could experience a similar “shock” that would affect the size or strength of the network as well a household’s probability of emigration. For example, a negative income shock, such as a crop failure in a rural Panchayet, could translate to greater emigration from the village and simultaneously increase the household’s probability of emigration. We should not expect that such a shock would be experienced differently across the three religious groups, but as an added robustness measure we include Panchayet-level dummies (Panchayet fixed effects) to an OLS specification of equations (1) and (2). When Panchayet “fixed effects” are included, the interaction terms remain robust (and significant at the 1 percent level) which leads us to conclude that Panchayet characteristics are not biasing the results.

7. CONCLUSIONS

The own network effect demonstrates that the relevant network for potential emigrants is the religious network. The results from our empirical analysis showed that the Hindu network has the strongest own network effect. The fact that the Hindu network has a larger effect on the emigration probability of Hindus than the Muslim network has

on Muslims contradicts the predictions advanced by Massey *et al.* (1998b) that communities with a higher emigration prevalence should have a higher probability of emigration. This finding may be surprising because one might assume that the Hindu network is less cohesive than the Muslim or Christian networks because the Hindu community had a much more stringent and stratified caste system as compared to the quasi-caste systems adopted by the Christian or Muslim communities in Kerala.

One possible explanation for the strength of the Hindu “own network effect” could be that Hindus, who have neither the advantage of Muslims in their religious compatibility with the Gulf region nor the educational advantage of Christians are simply more reliant on their networks for the opportunity to emigrate. In other words, the Hindu network may be more active simply because there is a greater demand by Hindus for the network while Christians and Muslims emigrate independently more easily.

McKenzie and Rapoport (2005) predicted that lower-skilled and credit-constrained migrants rely more on their networks. It is possible that Hindu households are more likely to be credit-constrained than Christian households, who are usually wealthier in Kerala because of their access to higher paying professional jobs, and Muslim households, who have recently become more wealthy due to huge inflows of remittances from the Gulf. If Hindu households are more credit-constrained, then we would expect Hindus to rely more heavily on their networks for resources towards emigration—resulting in a larger “own network effect.”²¹

Another possible explanation for the stronger Hindu own network effect could be attributed to the fact that Hindus make up more than 50 percent of Kerala’s total population and thereby have a higher likelihood of contact with other Hindus. This argument is similar to the assumption made by network theory that geographic proximity determines the strength of a migrant network. This explanation is contradicted, however, by the fact that Christians, who have the fewest number of contacts based on their absolute population in Kerala as well as a lower emigration rate compared to Muslims, who still have a stronger “own network effect” compared to the Muslim network.

²¹ As mentioned, the data did not contain information on the household’s income which would allow us to test this hypothesis. We have argued that the wealth proxies are poor estimates for the household’s current income because of the simultaneous relationship between the household’s wealth indicators and remittance volume.

What remains puzzling is that Muslims have the weakest own network effect but represent 50 percent of Gulf migration. Recall also that the coefficient on the Muslim dummy remained significant across the specifications. In both years, Muslims are more likely than Hindus to emigrate, controlling for networks effects.²² We interpret this finding to mean that there is something inherent to the Muslim community which makes emigration within this community more likely. The most obvious connection that Kerala's Muslims have with the Arab Gulf is religion itself. Thus, it seems as though Muslims are more likely to migrate to the Gulf regardless of the push or pull of their networks.

We also found that networks are destination-specific, implying that the primary resource that networks provide to their members is information rather than financing. As we would expect, information decays over time which is the most likely reason why return-emigrant networks had a very small and often insignificant effect on the migration probability of new emigrants. Similarly, information decay is probably why 1998 networks have little effect on the emigration probability of non-migrants but 2003 networks have a very strong effect for panel individuals.

²² In each regression, we omitted the Hindu dummy so that these results can be interpreted relative to Hindu males.

Table 1. Probit Estimates of the Marginal Effect of Geographic Networks on Emigration

Dependent Variable: Emigration				
	1998		2003	
	1	2	3	4
		<i>First-time</i>		<i>First-time</i>
EMI Network	0.66 [0.11]***	0.44 [0.08]***	1.06 [0.17]***	0.65 [0.09]***
EMI Network ²	-1.15 [0.25]***	-0.68 [0.19]***	-1.96 [0.59]***	-1.44 [0.30]***
REM network	0.63 [0.23]***	0.3 [0.18]*	-0.15 [0.37]	-0.28 [0.23]
REM Network ²	-2.82 [1.58]*	-2.35 [1.32]*	1.39 [3.19]	1.95 [1.87]
Muslim	0.1 [0.01]***	0.06 [0.01]***	0.1 [0.01]***	0.06 [0.01]***
Christian	0.02595 [0.00816]***	0.01362 [0.00533]**	0.01876 [0.01000]*	0.00935 [0.00747]
Education	0.02 [0.00]***	0.02 [0.00]***	0.01 [0.00]***	0.01 [0.00]***
Educ ²	0 [0.00]***	0 [0.00]***	0 [0.00]***	0 [0.00]***
Married	-0.09 [0.01]***	-0.06 [0.01]***	-0.11 [0.01]***	-0.05 [0.01]***
Unemployed	0.08 [0.02]***	0.06 [0.01]***	-0.1 [0.01]***	-0.05 [0.01]***
Age	0.05 [0.00]***	0.03 [0.00]***	0.06 [0.00]***	0.03 [0.00]***
Age ²	0 [0.00]***	0 [0.00]***	0 [0.00]***	0 [0.00]***
Other EMI in hh	0.41 [0.03]***		0.46 [0.03]***	
Family Size	0 [0.00]	0 [0.00]	0 [0.00]	0 [0.00]
Adult Males	-0.01 [0.00]***	-0.01 [0.00]***	-0.02 [0.00]***	-0.01 [0.00]***
Observations	13308	12573	12949	11916
R ²	0.3823	0.2486	0.4148	0.2357

Notes:

Robust standard errors in brackets

* significant at 10; ** significant at 5; *** significant at 1

In columns (2) and (4) the dependent variable is first-time emigration.

Regressions include in Columns (1) and (3) also include dummy variables equal to one if the household is an out-migrant or return emigrant household. The 1998 regressions also include variables indicating the average cost of emigration for the Panchayet, land ownership of the household, and an urban dummy.

Table 2. Probit Estimates of the Marginal Effect of Religious Networks on Emigration

Dependent Variable: Emigration				
	1998		2003	
	1	2	3	4
		<i>First-time</i>		<i>First-time</i>
Muslim Network	0 [0.02]	-0.01 [0.02]	0 [0.02]	0 [0.01]
Muslim Network* Muslim	0.31 [0.04]***	0.21 [0.03]***	0.28 [0.05]***	0.16 [0.03]***
Christian Network	0.02 [0.02]	0.01 [0.02]	0.03 [0.03]	0.02 [0.02]
Christian Network* Christian	0.59 [0.08]***	0.34 [0.06]***	0.47 [0.06]***	0.2 [0.04]***
Hindu Network	0.05 [0.04]	0.02 [0.03]	0 [0.06]	-0.03 [0.05]
Hindu Network* Hindu	0.74 [0.09]***	0.49 [0.05]***	0.75 [0.10]***	0.37 [0.05]***
Muslim	0.1 [0.01]***	0.06 [0.01]***	0.13 [0.02]***	0.06 [0.01]***
Christian	0.01141 [0.01059]	0.00789 [0.00688]	0.01123 [0.01501]	0.00917 [0.00935]
Education	0.02 [0.00]***	0.01 [0.00]***	0.01 [0.00]***	0.01 [0.00]***
Educ ²	0 [0.00]***	0 [0.00]***	0 [0.00]***	0 [0.00]***
Married	-0.09 [0.01]***	-0.06 [0.01]***	-0.11 [0.01]***	-0.05 [0.01]***
Unemployed	0.08 [0.01]***	0.06 [0.01]***	-0.09 [0.01]***	-0.05 [0.01]***
Age	0.05 [0.00]***	0.03 [0.00]***	0.05 [0.00]***	0.03 [0.00]***
Age ²	0 [0.00]***	0 [0.00]***	0 [0.00]***	0 [0.00]***
Other EMI in hh	0.36 [0.03]***		0.41 [0.03]***	
Family Size	0 [0.00]	0 [0.00]	0 [0.00]*	0 [0.00]
Adult Males	-0.01 [0.00]***	-0.01 [0.00]***	-0.02 [0.00]***	-0.01 [0.00]***
Observations	13308	12573	12949	11916
R ²	0.3975	0.2687	0.4270	0.2504

Notes:

Robust standard errors in brackets

* significant at 10; ** significant at 5; *** significant at 1

In columns (2) and (4) the dependent variable is first-time emigration.

Regressions include in Columns (1) and (3) also include dummy variables equal to one if the household is an out-migrant or return emigrant household. The 1998 regressions also include variables indicating the average cost of emigration for the Panchayet, land ownership of the household, and an urban dummy.

Table 3. Multinomial Logit Estimates of the Effect of Destination-Specific Religious Networks on Destination Choice

Dependent Variable: Destination Choice						
	1998			2003		
	Saudi	UAE	Oman	Saudi	UAE	OMAN
	1	2	3	4	5	6
<i>Saudi Networks</i>						
Muslim Network	1.07 [0.91]	-0.57 [1.08]	2.52 [1.32]*	-0.39 [1.51]	1.44 [1.01]	-2.3 [2.40]
Muslim Network* Muslim	9.64 [1.24]***	-0.39 [1.57]	-3.58 [2.71]	13.83 [1.90]***	-2.69 [1.73]	-2.9 [5.04]
Christian Network	0.15 [2.31]	-8 [4.25]*	-1.52 [5.65]	-0.26 [1.17]	-0.08 [1.16]	-3.32 [3.61]
Christian Network* Christian	25.09 [3.96]***	15.1 [6.47]**	7.02 [9.62]	21.06 [3.16]***	-2.7 [4.31]	4.18 [7.68]
Hindu Network	4.32 [1.81]**	3.05 [2.42]	4.46 [4.60]	2.2 [1.65]	0.71 [2.13]	6.86 [3.75]*
Hindu Network* Hindu	28.84 [3.46]***	-6.9 [6.71]	-18.27 [9.24]**	22.38 [3.85]***	-0.66 [5.47]	5.14 [5.32]
<i>UAE Networks</i>						
Muslim Network	-2.33 [1.83]	-1.79 [1.42]	-0.38 [1.73]	-0.91 [1.01]	1.32 [0.63]**	-0.99 [1.45]
Muslim Network* Muslim	-1.46 [2.26]	11.13 [1.77]***	-0.87 [2.85]	-3.2 [1.46]**	6.54 [0.86]***	-0.41 [2.42]
Christian Network	0.61 [1.41]	2.24 [1.97]	2.16 [3.18]	3.72 [1.63]**	1.6 [1.55]	3.38 [1.81]*
Christian Network* Christian	4.87 [5.31]	23.56 [4.92]***	0.68 [11.27]	-6.32 [3.91]	17.25 [3.12]***	9.19 [4.82]*
Hindu Network	-3.61 [4.08]	1.52 [3.68]	-8.19 [9.76]	2.68 [1.87]	1.3 [1.17]	0.04 [4.24]
Hindu Network* Hindu	13.45 [6.19]**	37.89 [5.66]***	27.48 [11.38]**	-0.31 [3.71]	14.88 [2.02]***	4.28 [5.80]
<i>Oman Networks</i>						
Muslim Network	-6.18 [6.04]	5.1 [5.44]	7.55 [5.78]	5.45 [4.64]	2.8 [4.33]	1.38 [6.12]
Muslim Network* Muslim	9.82 [7.10]	-3.98 [6.63]	34.77 [7.94]***	-5.78 [6.63]	0.22 [5.60]	32.54 [7.51]***
Christian Network	1.64 [1.79]	2.65 [1.62]	3.61 [2.10]*	1.13 [0.92]	0.13 [1.08]	-0.06 [2.20]
Christian Network* Christian	0.01 [7.13]	-0.11 [6.41]	13.76 [4.61]***	0.93 [3.72]	3.86 [3.35]	14.79 [3.30]***
Hindu Network	5.72 [2.83]**	1.06 [3.18]	-1.61 [8.20]	-2.55 [3.85]	0.41 [3.33]	-15.34 [12.10]
Hindu Network* Hindu	0.59 [5.55]	6.67 [5.85]	46.66 [9.33]***	0.85 [9.02]	6.28 [6.14]	58.96 [12.86]***
Observations	13308	13308	13308	12949	12949	12949
R ²	0.3461	0.3461	0.3461	0.3891	0.3891	0.3891

Notes:

Robust standard errors in brackets

* significant at 10; ** significant at 5; *** significant at 1

Output is relative to non-migration. The results of the choice of emigration outside of India other than to Saudi Arabia, the UAE, or Oman is not presented here.

All regressions include a dummy variable if the individual is Christian or Muslim, his education and its square, his age and its square, the number of other family members who have emigrated, his family size, the number of adult males in the household, and dummy variables if the household is an out-migrant or return emigrant household. The 1998 regressions also include variables indicating the average cost of emigration for the Panchayet, land ownership of the household, and an urban dummy.