Education and migration in Guatemala*

John A. Maluccio, Middlebury College
(john.maluccio@middlebury.edu)
Jere R. Behrman, University of Pennsylvania
John Hoddinott, International Food Policy Research Institute
Luis Fernando Ramírez, INCAP

This Draft: July 2008

*This research was supported by National Institutes of Health grants TW-05598 on "Early Nutrition, Human Capital and Economic Productivity" and HD-046125 on "Education and Health Across the Life Course in Guatemala", National Institute of Child Health and Human Development grant 5R01HD045627-05 on "Intergenerational Family Resource Allocation in Guatemala", and NSF/Economics grants SES 0136616 and SES 0211404 on "Collaborative Research: Nutritional Investments in Children, Adult Human Capital and Adult Productivities." We thank Alexis Murphy and Meng Wang for excellent research assistance in the preparation of the data for this paper.

Introduction:

The importance of investment in human capital is widely acknowledged for economic development. These are usually thought of to include health, nutrition, and education. There are many conceptual economic frameworks that justify individual and family investments in such outcomes, which are expected to have both intrinsic and extrinsic returns.

Another form of human capital investment, often not treated systematically together with the above-mentioned ones is migration. It is readily seen that migration requires investment, and yields returns. Motivations and reasons for migration, however, are many. One factor that is commonly considered a "determinant" of migration is education. If education, however, is acquired in part to change the returns or opportunities for migration, however, then treating the former as pre-determined in assessing its relationship with migration is not appropriate (see for example, Behrman et al. 2008 for a treatment of this subject for other human capital investments). They are co-determined.

In this paper, we examine how education influences migration in rural Guatemala, when the former is treated as endogenous or co-determined. This is done using a unique data set collected on all individuals ages 0 – 15 in four rural Guatemalan villages between 1969-1977. In addition to rich individual and family background information collected on these individuals in the 1970s, information on their whereabouts is available at four points in time since then, 1975, 1987, 1996, and 2002.

The Setting and Data:

In the mid-1960s, protein deficiency was seen as the most important nutritional problem facing the poor in developing countries, and there was considerable concern that this deficiency affected children's ability to learn. The Institute of Nutrition of Central America and Panama (INCAP), based in Guatemala, was the locus of a series of studies on this subject, leading to a nutritional supplementation trial begun in 1969 (Habicht and Martorell, 1992; Read and Habicht, 1992; Martorell et al., 1995a). The principal hypothesis underlying the trial was that improved preschool nutrition would accelerate mental development. An examination of the effects on physical growth was included to verify that the nutritional intervention had biological potency (Martorell et al., 1995a). To test the principal hypothesis, 300 rural communities with 500–1000 inhabitants in eastern Guatemala (in areas not directly affected by the civil war) were screened in an initial study to identify villages of appropriate compactness (so as to facilitate access to feeding centres—see below), ethnicity and language, diet, access to health care facilities, demographic characteristics, child nutritional status, and degree of physical isolation.

Using these criteria, two sets of village pairs (one pair of "small" villages with about 500 residents each and another pair of "large" villages with about 900 residents each) were selected.[1] Before the intervention, the village pairs were similar in terms of a variety of nutritional, social, and economic outcomes, though it turned out slightly less so in terms of educational outcomes. Child nutritional status before the intervention, as measured by length at three years of age, was

[1] There is little reason to believe the four villages ultimately selected were substantially atypical from the 300 potential candidates. For example, none of the four had had significant previous public health interventions (Habicht and Martorell, 1992). Information collected during the screening process on the other villages, however, is no longer available to explore this further.

similar across villages (Habicht et al., 1995), and indicated substantial undernutrition with over 50% severely stunted—height-for-age z-scores less than -3 (Martorell, 1992).[2] Maternal height was also not statistically different across villages (Rivera et al., 1995). Specially collected village census data showed similar patterns of civil status of household heads, religious affiliation, agricultural employment, and housing characteristics across the four villages. One village, however, had somewhat higher literacy and schooling levels for adults (Bergeron, 1992; Maluccio et al., 2005c).

Two of the villages, one from within each pair matched on population size (i.e., one large, known as Conacaste, and one small, San Juan), were randomly assigned to receive as a dietary supplement a high protein-energy drink, *atole*. *Atole* comprised Incaparina (a vegetable protein mixture developed by INCAP and widely accepted for young children in Guatemala), dry skim milk, and sugar, and had 163 kcal and 11.5 grams of protein per 180 ml cup. *Atole*, the Guatemalan name for porridge, was served hot and was slightly gritty, but with a sweet taste.

In designing the intervention, there was considerable concern that the social stimulation for children—resulting from their social interactions while attending feeding centres where the supplement was to be distributed, the observation and measurement of their nutritional status, and the monitoring of their intakes of *atole*—also might affect child nutritional and cognitive outcomes, thus confounding efforts to isolate the nutritional effect of the *atole* supplement. To address this concern, in the two remaining villages, Santo Domingo (large) and Espíritu Santo (small), an alternative supplement, *fresco*, was provided, under identical conditions. *Fresco* was a fruit-flavoured drink, which was served cool and thus an appreciated refreshment in these areas, where average monthly temperatures ranged from 24 to 30 degrees Celsius. It contained no protein and only sufficient flavouring agents and sugar for palatability, and had about one-third of the calories of *atole* per unit volume (59 kcal/180 ml). Several micronutrients (iron, thiamine, riboflavin, niacin, ascorbic acid, and vitamin A) also were added to both *atole* (which already had some) and *fresco*, in amounts that yielded equal concentrations across the supplements per unit of volume (Habicht and Martorell, 1992).[3]

The nutritional supplements (i.e., *atole* or *fresco*) were distributed in each village in centrally-located feeding centres and were available twice daily, to *all* members of the village on a voluntary basis, for two to three hours in the mid-morning and two to three hours in the mid-afternoon, times selected to be convenient to mothers and children, but that did not interfere with usual meal times. All residents of all villages also were offered high quality curative and preventative medical care free of charge throughout the intervention. Preventative services, including immunization and antiparasites campaigns, were conducted simultaneously in all villages.[4] To ensure that the results were not systematically influenced by the characteristics of

[2] Z-scores are used to normalize measured heights and weights against those found in well-nourished populations. They are age- and sex- specific; for example, a Z-score of height-for-age is defined as measured height minus median height of the reference population, all divided by the standard deviation of the reference population for that age/sex category. Therefore a z-score of -3 means three standard deviations of the reference population below the reference median.

[3] For the first two years of the intervention, *atole* had a higher concentration of micronutrients. Given the short period over which micronutrient concentrations differed, however, it is not feasible to isolate the effect of those differences in the empirical analyses.

[4] For the interpretation and consideration of the external validity of our findings below, it is important to underscore the nature of the intervention, which involved intensive contact between researchers and villagers, as well as the provision of quality medical care. If these aspects of the intervention affect equally the impact of the two supplements, then the contrasts we explore below are externally valid to situations without the survey and medical care components of the intervention. If not, the observed effects may have been diminished or potentiated by these other aspects of the intervention (Habicht and Martorell, 1992).

the health, research, or survey teams, all personnel were rotated periodically throughout the four villages, each of which was separated by at least 10 kilometres.

From 1969 to 1977, INCAP implemented the nutritional supplementation and the medical care. While the supplement was freely available to *all* village residents (as described above), the associated observational data collection focused on children between zero and seven years of age at *any point during* the intervention period.[5] Thus all children under seven years of age residing in the villages at the start of the intervention, as well as those born in the villages during the intervention, were included in the survey, a total of 2392 children. Data collected at the child level included precise measurement of actual daily supplement intakes (from which caloric and protein intakes can be calculated), periodic 24-hour food recall, and periodic anthropometric measurements until the child reached seven years of age or until the survey data collection ended in 1977, whichever came first. Nevertheless, in cases where the child surpassed seven years of age first, he or she continued to be exposed to the intervention until it ended. Children in the sample, then, were all born between 1962 and 1977 and the type, timing, and length of exposure for particular children depended on their village and date of birth.

We take advantage of the existence of another source of data on these same individuals, village censuses carried out in 1975, 1987, 1996, and 2002 (described in Maluccio et al. 2005c). These village censuses collected completed grades of schooling for all villagers (still) residing in the village at the time of each census, as well as basic location information for those no longer residing in the village. This allows us to explore both the patterns and timing of migration from the natal villages. The correspondence between the completed grades measure from the village census surveys and from HCS, for those measured in both data sets, is very high, with a correlation of 0.94 and only 8% of the observations differing by more than one grade of completed schooling.

Patterns of migration:

In Tables 1A and 1B, we show transition matrices for migration in and out of the original four villages for men and women separately during each of the census rounds. In 1975, about one-quarter of the original sample members were no longer living in the natal village. Since all of them were under 14 years of age at that time, this migration was predominantly at the household, rather than individual, level – consistent where there having been no differences by male or female. These patterns continued into 1987, though in that year 44% of women had left the villages in comparison to only 32% of men. This is consistent with patrilocal marriage patterns; women are more likely to move to the homestead of their partner. By 1996, however, 60% of both women and men had moved from the villages. The proportion outside the villages declined slightly by 2002, however.

Another important feature of the transition matrices is that they allow us to see patterns of movement out, but also back into, the villages. While most of those who migrate are permanent migrants, not all are. For example, 20% of men were designated as migrants in 1996 but by 2002 had returned to the village. Many fewer (5%) who were in the village in 1996, however, left between 1996 and 2002. On the whole, 75% stayed in the same state (e.g., in the village in both periods or migrant in both periods). Patterns for women

[5] The intervention began in the larger villages in February 1969, and in the smaller villages, in May 1969. The nutritional supplements and medical care ended in all four villages at the same time, in February 1977, and the survey data collection ended seven months later (Martorell et al., 1995a).

were similar, but with fewer (16%) returning to the natal village. While there is likely to be some measurement error here, it still suggests substantial transitory migration. This is consistent with moving to Guatemala City (or even to the US) for a period to work and save and then return home. The implication is that analyses of the determinants of migration are likely to differ if done at different points in time, and to a lesser extent different by sex. In what follows, we focus on the later periods of measurement, 1996 and 2002. In the latter period, individuals were 25-40 years of age.

In Table 2, we show in more detail the migration status for men and women in 2002, again by sex. These figures, in contrast to those in the transition tables, include those who have died and for this reason percentages in the village, for example, are lower. The primary destination for both men and women who migrate is greater Guatemala City. Only about 6-7% of original sample members were living abroad (and nearly all of these to the US), by 2002. Nevertheless, this is approximately one person for every two households on average.

Determinants of migration:

We posit a simple model to predict migration status, using community level shocks and other characteristics that are plausibly treated as exogenous to the household as predictors, as such, a reduced form model. We estimate probits and instrumental variable probits. The tests indicate that the instruments are relevant (though male education is somewhat weak) and that they are exogenous to the second stage, as indicated by the Wald test of exogeneity (Stata 2007).

Results are shown in Table 3, with varying sets of controls. Exogenous factors, such as village dummies, have plausible effects. For example, relative to Santo Domingo (the village closest to Guatemala city where, at least at present, it is possible to commute to many areas of the capital daily), the other village dummies are positive. Focusing on the association between years of completed schooling and migration, the OLS results indicate that there is a positive and significant relationship for women, but not for men. When we endogenize years of schooling, however, this pattern is reversed. For women, the relationship is now negative (but very small, and insignificant) and for men it is positive and significant, despite that feature of the set of estimations that the schooling variable is not even that well predicted using the excluded instruments. Results are similar when migration status in 1996 is considered instead.

[Possible extension is to consider these same relationships for a) wider set of siblings from the study who were born before and after masters or b) extending to include other measures of human capital, suitably endogenized, such as HAZ scores for which we have a large sample.]

Conclusions:

The role of education in determining migration is complicated, and must be treated simultaneously. OLS results, that simply treat years of schooling as predetermined, overestimate the effect of schooling on migration for women, and underestimate it for men. These findings can be related to marriage and labor market behavior.

Strengths of study include: 1) complete listing of individuals born into four villages and tracking them over a 30-year period. 2) Rich information on the environment under which these individuals were developing as children and adolescents, including information enabling one to endogenize schooling decisions in particular. 3) Set in a country where migration has increased substantially over the period, though the country remains with a large rural population, as evidenced by the microcosm we study here.

References:

Adams, R. (2005). Migration and remittances in Guatemala. World Bank working paper.

Alderman, H., Behrman, J.R., Kohler, H.P., Maluccio, J.A. and Cotts Watkins, S. (2001a). 'Attrition in longitudinal household survey data: Some tests for three developing country samples', *Demographic Research* [Online], vol. 5(4), pp. 79–124. Available at <http://www.demographic-research.org>.

Behrman, J.R., Hoddinott, J., Maluccio, J.A., Soler-Hampejsek, E., Behrman, E.L., Martorell, R., Quisumbing, R.L., Ramírez, M. and Stein, A.D. (2008). 'What determines adult skills? Impacts of preschool, school-years and post-school experiences in Guatemala', University of Pennsylvania, Working Paper.

Estudio 1360. (2002). *Changes in the socioeconomic and cultural conditions that affect the formation of human capital and economic productivity*, Final report presented to The Institute of Nutrition of Central America and Panama (INCAP), May 13. Photocopy.

Grajeda, R., Behrman, J.R., Flores, R., Maluccio, J.A., Martorell, R. and Stein, A.D. (2005). 'The human capital study 2000–04: Tracking, data collection, coverage, and attrition', *Food and Nutrition Bulletin*, vol. 26(2) (Supplement 1), pp. S15–S23.

Habicht, J.P. and Martorell, R. (1992). 'Objectives, research design, and implementation of the INCAP longitudinal study', *Food and Nutrition Bulletin*, vol. 14(3), pp. 176–90.

Habicht, J.P., Martorell, R. and Rivera, J.A. (1995). 'Nutritional impact of supplementation in the INCAP longitudinal study: analytic strategies and inferences', *Journal of Nutrition*, vol. 125(4S), pp. 1042S–50S.

Hoddinott, J. (199x). A model of migration and remittances. Economic Journal.

Maluccio, J.A., Martorell, R. and Ramírez, L.F. (2005a). 'Household expenditures and wealth among young Guatemalan adults', *Food and Nutrition Bulletin*, vol. 26(2) (Supplement 1), pp. S110–9.

Maluccio, J.A., Murphy, A. and Yount, K.M. (2005b). 'Research note: A socioeconomic index for the INCAP Longitudinal Study 1969–77', *Food and Nutrition Bulletin*, vol. 26(2) (Supplement 1), pp. S120–4.

Maluccio, J.A., Melgar, P., Méndez, H., Murphy, A. and Yount, K.M. (2005c). 'Social and economic development and change in four Guatemalan villages: Demographics, schooling, occupation, and assets', *Food and Nutrition Bulletin*, vol. 26(2) (Supplement 1), pp. S55–67.

Martorell, R. (1992). 'Overview of long-term nutrition intervention studies in Guatemala', *Food and Nutrition Bulletin*, vol. 14(3), pp. 270–7.

Martorell, R., Behrman, J.R., Flores, R. and Stein, A.D. (2005). 'Rationale for a follow-up study focusing on economic productivity', *Food and Nutrition Bulletin*, vol. 26(2) (Supplement 1), pp. S5–14.

Pivaral, V.M. (1972). *Características Económicas y Socioculturales de Cuatro Aldeas Ladinas de Guatemala. Ministerio de Educación Pública, Instituto Indigenista Nacional*, Guatemala: INCAP.

Read, M.S. and Habicht, J.P. (1992). 'History of the INCAP longitudinal study on the effects of early nutrition supplementation in child growth and development', *Food and Nutrition Bulletin*, vol. 14(3), pp. 169–75.

Smith, J., and Thomas, D. (199x). On the road: Marriage and mobility in Malaysia. JHR.

StataCorp. (2007). *Stata Statistical Software: Release 10.0*, College Station, TX, Stata Corporation.

Victora, C.V., Adair, L., Fall, C., Hallal, P.C., Martorell, R., Richter, L. and Sachdev, H.S. (2008). 'Maternal and child undernutrition: Consequences for adult health and human capital', *Lancet*, vol. 371(9609, 26 January), pp. 340–57.

World Bank. (2003). *Poverty in Guatemala*, Report No. 24221-GU, Washington, DC, World Bank.

Table 1A: Migration transition matrices, Men: N (%)

		1987			1996			2002		TOTAL
		In village	Migrant		In village	Migrant		In village	Migrant	1975
	In village	533 (58)	164 (18)		312 (34)	385 (42)		450 (49)	247 (27)	697 (76)
1975	Migrant	60 (7)	157 (17)		29 (3)	188 (21)		51 (6)	166 (18)	217 (24)
	Total	593 (65)	321 (35)		341 (37)	573 (63)		501 (55)	413 (45)	914 (100)
										1987
				In village	390 (36)	336 (31)		513 (48)	213 (20)	726 (68)
			1987	Migrant	37 (3)	307 (29)		79 (7)	265 (25)	344 (32)
				Total	427 (40)	643 (60)		592 (55)	478 (45)	1070 (100)
										1996
							In village	379 (35)	48 (5)	427 (40)
						1996	Migrant	213 (20)	430 (40)	643 (60)
								592 (55)	478 (45)	1070 (100)

Notes: Includes all original sample (master) men still alive in 2002. Those not yet born in 1975 excluded from the 1975 matrices.

Table 1B: Migration transition matrices, Women: N (%)

		1987			1996			2002		TOTAL
		In village	Migrant		In village	Migrant		In village	Migrant	1975
	In village	427 (47)	279 (30)		305 (33)	401 (44)		395 (43)	311 (34)	706 (77)
1975	Migrant	54 (6)	152 (17)		43 (5)	163 (18)		50 (5)	156 (17)	206 (23)
	Total	481 (53)	431 (47)		348 (38)	564 (62)		445 (49)	467 (51)	912 (100)
										1987
				In village	305 (29)	286 (27)		400 (38)	191 (18)	591 (56)
			1987	Migrant	101 (10)	359 (34)		121 (12)	339 (32)	460 (44)
				Total	406 (39)	645 (61)		521 (50)	530 (50)	1051 (100)
										1996
							In village	356 (34)	50 (5)	406 (39)
						1996	Migrant	165 (16)	480 (46)	645 (61)
								521 (50)	530 (50)	1051 (100)

Notes: Includes all original sample (master) women still alive in 2002. Those not yet born in 1975 excluded from the 1975 matrices.

Table 2: More detailed location information in 2002, by gender

(1) MEN

Migration category, mc	Freq.	Percent	Cum.
Original villages	592	48.13	48.13
Nearby villages	59	4.80	52.93
In/near Guate City	197	16.02	68.94
Elsewhere in Guate	89	7.24	76.18
Left country	89	7.24	83.41
Died	160	13.01	96.42
Untraceable	44	3.58	100.00
Total	1,230	100.00	

(2) WOMEN

Migration category, mc	Freq.	Percent	Cum.
Original villages	521	44.80	44.80
Nearby villages	95	8.17	52.97
In/near Guate City	222	19.09	72.06
Elsewhere in Guate	81	6.96	79.02
Left country	74	6.36	85.38
Died	112	9.63	95.01
Untraceable	57	4.99	100.00
Total	1,162	100.00	

Table 3: Migration probits

Women :

Probit regression, reporting marginal effects

Number of obs = 1050
Wald chi2(27) = 115.67
Prob > chi2 = 0.0000
Log pseudolikelihood = -636.58459
Pseudo R2 = 0.1253

(Std. Err. adjusted for 589 clusters in mothfe)

prmigr02	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95%	C.I.]
school	.0222468	.0065199	3.41	0.001	4.31905	.009468	.035026
ngrade07	.0498713	.0581467	0.86	0.391	5.7981	-.064094	.163837
pstruc07*	.0166687	.062885	0.27	0.791	.477143	-.106584	.139921
pstruc15*	.0362711	.1104274	0.33	0.743	.891429	-.180163	.252705
stu_t~07	.0029778	.002331	1.28	0.202	40.3381	-.001591	.007546
stu_t~15	.0077831	.004957	1.57	0.116	35.9848	-.001932	.017499
exp00_36*	.0494191	.0582558	0.85	0.397	.369524	-.06476	.163598
e~00_36a*	-.0909796	.0834154	-1.09	0.278	.199048	-.254471	.072512
sanjuan*	-.0398713	.2003374	-0.20	0.842	.224762	-.432525	.352783
conacast*	-.031939	.1189994	-0.27	0.788	.305714	-.265174	.201295
byr_2	7.28e-07	2.35e-06	0.31	0.757	3.9e+06	-3.9e-06	5.3e-06
lagemom7	-.271835	.1258341	-2.16	0.031	3.51437	-.518465	-.025205
lagedad7	.0519442	.1267488	0.41	0.682	3.6637	-.196479	.300367
momeduc	.010707	.0116652	0.92	0.359	1.27238	-.012156	.03357
dadeduc	.0023637	.0104699	0.23	0.821	1.64857	-.018157	.022884
pca~6775	.0214543	.0238163	0.90	0.368	-3.07724	-.025225	.068133
dumdad~c*	.2139627	.0661276	2.98	0.003	.124762	.084355	.34357
dummom~c*	.2633688	.0889989	2.52	0.012	.07619	.088934	.437803
dumag~d7*	.0025729	.0842435	0.03	0.976	.082857	-.162541	.167687
dumag~m7*	.2403506	.0918207	2.26	0.024	.031429	.060385	.420316
dum6775*	.2389845	.0620422	3.48	0.001	.14	.117384	.360585
cement15*	-.2549066	.1569872	-1.57	0.118	.522857	-.562596	.052783
yuqui~15*	-.0808324	.1012394	-0.79	0.427	.114286	-.279258	.117593
veggie15*	.1110221	.086518	1.26	0.208	.207619	-.05855	.280594
busgu~15*	.2127066	.1655922	1.19	0.236	.137143	-.111848	.537261
busmu~15*	-.2514966	.1065147	-2.11	0.035	.040952	-.460262	-.042732
access15*	-.3340403	.1719117	-1.81	0.071	.340952	-.670981	.0029

Table 3: Migration probits
Men

```
Probit regression, reporting marginal effects          Number of obs =   1068
                                                       Wald chi2(27) = 134.70
                                                       Prob > chi2   = 0.0000
Log pseudolikelihood = -617.23462                      Pseudo R2     = 0.1590

                              (Std. Err. adjusted for 591 clusters in mothfe)
```

prmigr02	dF/dx	Robust Std. Err.	z	P>|z|	x-bar	[95%	C.I.]
school	.0078541	.0062056	1.27	0.206	4.90637	-.004309	.020017
ngrade07	.0827534	.0561285	1.47	0.140	5.84176	-.027256	.192763
pstruc07*	-.0217785	.0633489	-0.34	0.731	.511236	-.14594	.102383
pstruc15*	-.09653	.1141818	-0.84	0.401	.911049	-.320322	.127262
stu_t~07	.0031835	.0025427	1.25	0.210	39.5234	-.0018	.008167
stu_t~15	-.0053798	.0048986	-1.10	0.272	36.0552	-.014981	.004221
exp00_36*	.0117889	.0591671	0.20	0.842	.402622	-.104176	.127754
e~00_36a*	-.100404	.079163	-1.25	0.213	.199438	-.255561	.054752
sanjuan*	.0944776	.1984179	0.47	0.635	.21161	-.294414	.48337
conacast*	.0894185	.119193	0.75	0.454	.308052	-.144196	.323033
byr_2	-1.12e-06	2.25e-06	-0.50	0.617	3.9e+06	-5.5e-06	3.3e-06
lagemom7	-.0866102	.1250221	-0.69	0.489	3.5175	-.331649	.158429
lagedad7	.1667215	.1241322	1.34	0.179	3.66217	-.076573	.410016
momeduc	-.0070848	.0119739	-0.59	0.554	1.36985	-.030553	.016384
dadeduc	.0242763	.0098669	2.46	0.014	1.70131	.004938	.043615
pca~6775	.0278292	.0241998	1.15	0.250	-3.05173	-.019602	.07526
dumdad~c*	.3026295	.0641754	4.26	0.000	.152622	.176848	.428411
dummom~c*	.3293111	.0812345	3.42	0.001	.100187	.170094	.488528
dumag~d7*	-.037652	.0801384	-0.47	0.640	.106742	-.19472	.119416
dumag~m7*	-.0362587	.1068958	-0.34	0.736	.029963	-.245771	.173253
dum6775*	.3494485	.059753	4.93	0.000	.134831	.232335	.466562
cement15*	-.0354843	.169924	-0.21	0.835	.560861	-.368529	.297561
yuqui~15*	-.0595947	.0996975	-0.59	0.554	.096442	-.254998	.135809
veggie15*	-.0044699	.0896407	-0.05	0.960	.219101	-.180162	.171223
busgu~15*	-.0738959	.1860933	-0.39	0.695	.159176	-.438632	.29084
busmu~15*	-.0371346	.110831	-0.33	0.739	.047753	-.254359	.18009
access15*	.0578549	.1984451	0.29	0.771	.35206	-.33109	.4468

Table 4 Migration probits: IV

WOMEN

Probit model with endogenous regressors — Number of obs = 1050; Wald chi2(20) = 111.80

(Std. Err. adjusted for 589 clusters in mothfe)

prmigr02	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
school	-.0526586	.1430285	-0.37	0.713	-.3329892	.2276721
sanjuan	-.0053774	.4333418	-0.01	0.990	-.8547117	.8439569
conacast	-.2241959	.298417	-0.75	0.452	-.8090824	.3606906
byr_2	3.19e-06	4.24e-06	0.75	0.451	-5.12e-06	.0000115
lagemom7	-.594597	.3341877	-1.78	0.075	-1.249593	.0603989
lagedad7	.1195438	.3058047	0.39	0.696	-.4798225	.7189101
momeduc	.0651171	.0560598	1.16	0.245	-.044758	.1749923
dadeduc	.0254894	.0332903	0.77	0.444	-.0397584	.0907372
pcall6775	.1281289	.1040073	1.23	0.218	-.0757215	.3319794
dumdadeduc	.4234637	.2878561	1.47	0.141	-.1407238	.9876513
dummomeduc	.7661301	.2744177	2.79	0.005	.2282813	1.303979
dumagedad7	.001027	.2079338	0.00	0.996	-.4065158	.4085698
dumagemom7	.458383	.3986051	1.15	0.250	-.3228687	1.239635
dum6775	.6905012	.1897618	3.64	0.000	.3185749	1.062428
cement15	-.4622372	.2919392	-1.58	0.113	-1.034428	.1099532
yuquilla15	-.1220473	.2196115	-0.56	0.578	-.5524779	.3083833
veggie15	.3024017	.187005	1.62	0.106	-.0641213	.6689248
busguat15	.0552189	.3577072	0.15	0.877	-.6458743	.7563121
busmuni15	-.5016345	.2535501	-1.98	0.048	-.9985836	-.0046854
access15	-.3904795	.3636207	-1.07	0.283	-1.103163	.322204
_cons	-9.993363	16.00946	-0.62	0.532	-41.37133	21.3846

MEN

Probit model with endogenous regressors — Number of obs = 1068; Wald chi2(20) = 431.57

(Std. Err. adjusted for 591 clusters in mothfe)

prmigr02	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
school	.2752323	.0829969	3.32	0.001	.1125614	.4379032
sanjuan	.3081128	.3072733	1.00	0.316	-.2941318	.9103575
conacast	.1220147	.1949473	0.63	0.531	-.2600751	.5041044
byr_2	-6.11e-06	3.38e-06	-1.81	0.070	-.0000127	5.06e-07
lagemom7	.0303956	.292493	0.10	0.917	-.5428801	.6036714
lagedad7	-.0615906	.3544254	-0.17	0.862	-.7562517	.6330704
momeduc	-.1170571	.0428027	-2.73	0.006	-.2009489	-.0331654
dadeduc	-.022936	.0472048	-0.49	0.627	-.1154557	.0695838
pcall6775	-.1277418	.0976256	-1.31	0.191	-.3190846	.0636009
dumdadeduc	.7443348	.2313123	3.22	0.001	.290971	1.197699
dummomeduc	.5479927	.368526	1.49	0.137	-.174305	1.27029
dumagedad7	-.0325402	.173564	-0.19	0.851	-.3727193	.3076389
dumagemom7	-.059193	.2236748	-0.26	0.791	-.4975875	.3792015
dum6775	.4202557	.3846141	1.09	0.275	-.333574	1.174085
cement15	-.1128677	.2108384	-0.54	0.592	-.5261034	.3003679
yuquilla15	-.20569	.2119175	-0.97	0.332	-.6210406	.2096607
veggie15	.1956491	.1845341	1.06	0.289	-.1660312	.5573294
busguat15	.4235093	.354082	1.20	0.232	-.2704787	1.117497
busmuni15	-.2642504	.1967533	-1.34	0.179	-.6498798	.1213789
access15	-.397859	.3444588	-1.16	0.248	-1.072986	.2772678
_cons	22.05262	13.00488	1.70	0.090	-3.436474	47.54172