Family Migration and Labor Force Outcomes: Sex Differences in Occupational Context

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Empirical analyses of sex differences in the career consequences of family migration have focused on adjudicating between the human capital and the gender-role explanations but have ignored the potential influence of gender inequality in the structure of the labor market. In this paper we estimate conditional difference-in-difference models with individual-, family- and occupation-level data to test a structural explanation that attributes sex differences in the returns to family migration to occupational sex segregation. Despite using measures of relevant occupational characteristics and occupational fixed effects, our results do not support the structural explanation. Instead, the results add to the body of empirical evidence that is consistent with the gender-role explanation of sex differences in the experience of family migration.

Introduction

In contrast to the positive influence long-distance mobility has on the career development of married men, for married women family migration is associated with low rates of employment, reductions in hours worked and depressed earnings growth (Bailey and Cooke 1998; Boyle, Cooke, Halfacree and Smith 2001; Boyle, Cooke, Halfacree and Smith 2003; Boyle, Halfacree and Smith 1999; Bruegel 1996; Bruegel 1999; Clark and Withers 2002; Cooke 2001; Cooke 2003; Cooke and Bailey 1999; Cooke and Speirs 2005; Duncan and Perrucci 1976; Jacobsen and Levin 1997; Jacobsen and Levin 2000; Lichter 1980; Lichter 1982; Long 1974; Marwell, Rosenfeld and Spilerman 1979; Maxwell 1988; Mincer 1978; Morrison and Lichter 1988; Shihadeh 1991; Spitze 1984). These well-documented disparities in the labor force returns to migration most often are attributed to women's lesser human capital investments or to their secondary role in family migration decisions and, consequently, to their greater likelihood of experiencing "tied" migration (Mincer 1978). These explanations focus on gender inequality at the individual level or within the family and ignore the potential influence of structural gender inequality within the labor market.

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A structural perspective offers a different explanation: sex asymmetry in the returns to migration may be attributable to the segregation of men and women in occupations that differ in the extent to which geographic mobility enhances career mobility. This structural explanation is explicit in Mincer's (1978) formulation of the microeconomic theory of family migration and is further elaborated by Halfacree (1995), but it has yet to be empirically tested. In this paper, we provide the most rigorous test to date of the human capital and gender-role explanations of sex differences in the effect of family migration by controlling for the confounding effects of structural gender inequality. We test the structural explanation in two ways: 1.) by incorporating measures of theoretically relevant occupational characteristics and 2.) by including occupational fixed effects in our models. We use individual- and family-level data from the *Panel Study of Income Dynamics* (PSID), occupation-level data from the 1970-1990 U.S. Decennial Censuses Integrated Public Use Micro Samples (IPUMS), and conditional difference-in-differences models to estimate the sex gap in the career consequences of family migration in the context of occupational characteristics.

Competing Explanations of the Gendered Influence of Family Migration

The microeconomic and the gender-role models of family migration are the dominant competing explanations of sex disparities in the career consequences of family migration, and they provide the most commonly used frameworks for the interpretation of empirical results. The structural model has received less attention. We outline each perspective and related hypotheses in the following sections. The central point of contention among the competing explanations is this: Are sex differences in the benefits from migration due to sex differences in the *distribution* of influential individual, familial or occupational characteristics or to sex differences in the effects of the characteristics that influence family migration decisions?

Microeconomic Model of Family Migration

The microeconomic model posits that families migrate when the benefits of moving outweigh the costs (Mincer 1978). When making migration decisions, individual family members are assumed to subjugate their own rational interests to the interests of the family, and in so doing they may forgo personally beneficial opportunities (Bielby and Bielby 1992; Mincer 1978). Migration should therefore generate positive net returns to family utility, although the individual costs and benefits are likely to be unequally distributed within the family (i.e., each family migration is likely to include a "tied" partner, whose "private calculus" contradicts the family migration decision) (Mincer 1978:751). According to the microeconomic model, the distribution of individual costs and benefits depends only on the actual and potential contribution of each partner to family utility and is independent of the sex of the marriage partner. The sex gap in personal returns to family migration is therefore attributed to the fact that married women, on average, have less human capital (i.e., education, work experience, etc.) and therefore lesser earnings potential than married men.

Hypothesis 1: *Sex differences in the returns to family migration will be explained by sex differences in human capital investments*.

Past research has focused exclusively on individual-level human capital hypotheses, and thus has accomplished an incomplete test of the microeconomic explanation. Mincer (1978) posited that occupational sex segregation and gender inequality in the labor force would also structure sex asymmetry in the distribution of the costs and benefits related to family migration (Bielby and Bielby 1992; Halfacree 1995). For example, differences in the characteristics of male- and female-dominated occupations, such as average wage and career ladder length, mean that wives are less likely than husbands to initiate moves because wives' gains from migration are unlikely to exceed their husbands' losses. Sex differences in occupational characteristics also mean that wives are less likely than husbands to resist moves because their earnings loss associated with family migration is likely to be offset by the potential income gains for their husbands. Due to sex differences in occupational characteristic, therefore, married women are likely to be overrepresented among both tied stayers and tied movers even with controls for differences in human capital investments. Without controls for the occupational characteristics of each partner, estimates of the role individual-level human capital variables play in explaining the sex gap in the returns to family migration may be upwardly biased.

Gender-role Model of Family Migration

Sociological explanations of sex disparities in the returns to migration have focused on the influence of gender-role ideology on decision making within families (Hood 1983). Men and women fulfill different roles in the family, and those roles are influenced by the gender-role ideology of each marital partner. Men typically assume the role of breadwinner and women typically assume the role of homemaker within the family, irrespective of their relative earnings (Potuchek 1997). According to gender-role theory, men and women's roles within the family are not interchangeable; therefore the costs and benefits of migration will not be calculated in the same way for women and men, as is assumed in the neoclassical microeconomic model (Bielby and Bielby 1992; Halfacree 1995).

Because of data limitations, empirical analyses of family migration decisions and their labor market outcomes have rarely included direct measures of gender-role ideology or of the motivation for the move (exceptions include Bielby and Bielby 1992). Support for the gender-role explanation of sex differences in the returns to migration therefore is typically inferred from: 1.) residual sex disparities in labor force outcomes remaining after controlling for human capital variables; 2.) the power of controls for family structure and the household division of labor to explain sex disparities in labor force outcomes; and 3.) sex differences in the influence of human capital and family structure variables on both the migration decision and subsequent labor force outcomes. We test the gender-role explanation using the second and third strategies:

Hypothesis 2: *Sex differences in the returns to family migration will be explained by controls for indicators of family structure and gender roles within the family.*

Hypothesis 3: *The association between family migration and career outcomes will be conditioned by individual, familial and occupational characteristics in sex-specific ways, even in the context of controls for occupational characteristics.*

The gender-role explanation of family migration is not exclusive of the structural perspective: the actions and interactions that entail "doing gender" (West and Zimmerman 1987) within the family may be structured partially by sex segregation and stratification in the labor force. Yet migration researchers have not heeded calls for "external perspectives" that renew attention to the influence of the sex-typing of paid labor on the secondary position of women in family migration (Halfacree 1995; Halfacree and Boyle 1999). In the absence of direct measures of gender-role ideology, researchers must be especially careful to directly test alternative explanations for sex differences in career consequences of family migration.

The Structural Perspective: The Importance of Occupational Context

At the individual level, long-distance migration is most often motivated by career opportunities, but the association between migration and career development also is likely to be influenced by specific characteristics of occupational labor markets. Labor market characteristics may influence the association between geographic mobility and promotion, the frequency of career-related geographic moves, and the spatial distance of each move. Occupations with high rates of long-distance migration are characterized by decentralized work settings, relatively high levels of worker authority and independence, and labor markets that are national (i.e., that have strong nation-wide collegial connections and active social networks such as professional organizations) (Ladinsky 1967). For individuals involved in high mobility labor markets, migration can be used to accumulate experience rapidly and to skip rungs on the promotion ladder (Markham and Pleck 1986).

The occupational characteristics that foster the association between migration and career mobility are likely, however, to be unequally distributed by sex. Because a high degree of occupational sex segregation persists in the United States, women and men tend to work in qualitatively different occupations (Reskin 1993). Women are employed disproportionately in occupations that are more geographically ubiquitous, that entail work that is standardized, that draw workers from local labor markets, and that lack extended occupational ladders defining a "career." These structural characteristics are associated with low levels of work-related migration (Ladinsky 1967), as well as limited attainment of lifetime earnings and occupational prestige, frequent job and employer changes, and discontinuous labor force participation. So while occupational sex segregation may produce sex differences in the distribution of opportunities for work-related migration and its rewards, it also produces sex differences in labor force outcomes more generally.

Researchers have recognized the influence of occupational context on family migration processes (Halfacree 1995), but prior studies of sex differences in the consequences of family migration include only basic controls for occupation and/or industry (Boyle et al. 2001; Bruegel 1999; Jacobsen and Levin 1997; Lichter 1983), occupational status (Boyle, Cooke, Halfacree and Smith 1999; Boyle et al. 2003), or focus on a single occupation or industry (Deitch and Sanderson 1987). Studies that control for occupation/industry use broad classifications that do not capture the specific job or labor market characteristics that are distributed unevenly by sex and which likely condition the relationship between geographic mobility and career advancement. A more accurate model of the nuanced relationship between migration, sex and career outcomes would include controls for theoretically relevant occupational characteristics, such as geographic ubiquity, length of career ladder and tightness of the labor market. For example, some characteristics of female-dominated occupations such as geographic ubiquity and standardized work may facilitate consistent employment among tied migrants but these characteristics may also be associated with depressed earnings growth. Thus, accounting for female overrepresentation in geographically ubiquitous occupations may help explain the female deficit in the economic rewards to family migration even when migration does not cause a female deficit in employment status.

> Hypothesis 4: *Sex differences in the returns to family migration will be explained by sex differences in occupational characteristics.*

Research Design

Data

For this analysis we use individual- and family-level data from the PSID that have been merged with occupation-level data from the 1970-1990 IPUMS (Ruggles et al. 2004). All men and women aged 25-59 who resided in a married couple in each annual wave of the PSID between 1981 and 1993 are included in this analysis. A survey respondent contributes a person-year to the analytical sample if s/he is married consistently for a one-year period of observation and is employed at the start of the observation period, has valid data for all dependent variables, marital status, sex, migration status, and neither the respondent nor her/his spouse reports being a member of the armed forces, retired, permanently disabled, on public assistance, or in prison or jail at either the start or end of the observation period. Excluding individuals who separate or divorce allows us to focus the analysis on the association between family migration and career outcomes, without confounding that relationship with the effects of marital dissolution (Mincer 1978). We also exclude cohabiting couples from the analysis because their family transitions, division of labor and migration patterns are distinct from those of married couples. Applying these selection criteria yield 5,072 married men and 4,120 married women who contributed between 2 and 10 person years to yield 40,327 person-year observations (24,047 for men and 16,280 for women).[1]

Our analysis focuses on the association between family migration and annual changes in two labor force outcomes measured at the individual level: a binary indicator of employment status and a continuous measure of earnings from wages or salary.[2] Respondents who report working for pay at the time of a survey are coded as employed. Earnings are standardized to constant 1982-1984 dollars using the Consumer Price Index (CUUR0000SA0 series). We analyze the influence of migration on changes in employment using the full sample of individuals. Because changes in earnings are confounded with changes in employment, however, we analyze changes in earnings using a sub-sample that includes only the person-year observations contributed by individuals who remained consistently employed (i.e., those employed at both the start and end of each one-year interval). Although some argue that such sample restrictions lead to biased estimates of the effect of migration on earnings because those who experience the greatest earnings gains or losses are excluded (Cooke 2003; Lichter 1983), we believe this sample selection is necessary to avoid confounding the effect of migration on employment with the effect of migration on earnings.

Our main independent variable is family migration, MOVE. MOVE is defined as a migration across the boundaries of metropolitan areas[3] and is assessed for each yearly interval of the panel data by combining self-reports of migration during the year preceding the interview with comparisons of year-specific geographic identifiers of the residential location of each family. Those who migrate are movers (MOVE = 1), and those who do not migrate are stayers.

Variables measuring individual-, family- and occupation-level covariates are evaluated at the start of each one-year interval. Individual-level explanatory variables include sex (female = 1), age, educational attainment, hours worked, and occupational prestige as measured by SEI score (Hauser and Warren 1997). In addition, we control for each individual's earnings at the start of each yearly interval to control for the influence that the level of income may exert on the likelihood of subsequent changes in employment and earnings. Family-level variables measure family structure and the division of household labor. Family structure is captured with a count of minor children living in the household and an indicator of childbearing over the yearly interval. The household division of labor is measured by the respondent's relative contribution to family income and a categorical indicator of the labor force status of the respondent's spouse.[4]

Four occupational characteristics that may condition the association between migration and career outcomes are measured using data from the 1970, 1980 and 1990 IPUMS (Ruggles et al. 2004).[5] The first is the prevalence of migration in each occupation, which we operationalized as the proportion of workers who experienced an inter-state migration during the five years preceding the census. Second, we use the ratio of the 80th to the 20th percentile of the earnings distribution as a measure of the potential for earnings growth in an occupation. Third, the relative tightness of the occupational labor market is measured by the unemployment rate in each occupation. Finally, we constructed a measure of the geographic ubiquity of an occupation. This variable is defined as an index of dissimilarity: it measures the degree to which employment in each occupational category is unequally distributed across metropolitan areas of the United States

and ranges between 0 and 1.[6] Occupations in which employment is concentrated in relatively few labor markets will have low values on the measure of geographic ubiquity, and occupations that are prevalent in most all areas of the country will have high values. Year-specific measures of each of the four labor force characteristics for each occupation are generated through linear interpolation based on the three decennial estimates (1970, 1980 and 1990). These measures of occupational characteristics are linked to the PSID data by year and occupation for each husband and wife in the analytical sample.

Methods

We use a conditional difference-in-differences (CDID) model (Abadie 2005) to estimate the effects of migration on labor force outcomes. The simple difference-in-differences (DID) estimator measures the effect of some treatment as the difference between the treated and non-treated in the before-after difference in some outcome. For example, the effect of migration on earnings is estimated as the mean difference between migrants and non-migrants in their change in earnings between the start and end of a period of potential migration. The estimated coefficient for MOVE represents the estimated effect of migration, i.e., the DID, in the model

$$\Delta Y = \beta_0 + \beta_1 \text{ MOVE},$$

where ΔY is the change in the labor force outcome between t-1, the start of each one-year period of observation, and t, the end of the period. The CDID expands the simple estimator to a multivariate context by incorporating independent variables that may generate variation in the before-after difference across population subgroups. The CDID model can include covariates that 1.) differentiate movers from non-movers (i.e., selection effects), and 2.) influence the relationship between migration and ΔY. Because the CDID can control for pre-existing differences between "treatment" and "control" groups, this method allows us to estimate the "true" effect of migration on labor force outcomes. This is important because pre-existing group differences may be correlated with the likelihood of migration.

Because we are interested in measuring sex differences in the association between migration and changes in employment status and earnings, we estimate the following model:

$$\Delta Y = \beta_0 + \beta_1 \text{ MOVE} + \beta_2 \text{ SEX} + \beta_3 \text{ MOVE*SEX} + \beta_{4\ldots8}(\text{individual characteristics}) + \beta_{9\ldots13}(\text{family characteristics}) + \beta_{14\ldots17}(\text{occupational characteristics}).$$

In this specification β_1 represents the effect of migration on the change in the labor force outcome (ΔY) for males, β_2 represents the estimated effect of being female on ΔY, and β_3 represents the female-to-male difference in the association between migration and ΔY. In the absence of controls for other covariates, k, the estimated coefficient for the MOVE*SEX interaction, β_3, measures the extent and significance of marginal sex differences in the association between migration and labor force outcomes. We estimate binary logit CDID models for changes in employment status and linear regression CDID models for changes in earnings.

Table 1: Descriptive Statistics for Labor Force Outcomes

	Labor Force Characteristics at Start of Each One-Year Interval (*t*-1)							Labor Force Characteristics at End of Each One-Year Interval (*t*)						
	Husbands			Wives				Husbands			Wives			
	Stayers	Movers	Total	Stayers	Movers	Total		Stayers	Movers	Total	Stayers	Movers	Total	
	μ_S	μ_M	μ_H	μ_S	μ_M	μ_W	$(\mu_W-\mu_H)$	μ_S	μ_M	μ_H	μ_S	μ_M	μ_W	$(\mu_W-\mu_H)$
Panel A: Full sample														
n	23,392	655	24,047	15,909	371	16,280								
Proportion employed	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	1.00 (.00)	0.00 (.00)	.99 (.10)	.99 (.11)	.99 (.10)	.90 (.29)	.69*** (.46)	.90 (.30)	-.09††† (.00)
Earnings from wages/salary [a]	25.49 (25.83)	24.26 (16.38)	25.46 (25.63)	12.71 (9.62)	13.32 (10.79)	12.73 (9.65)	-12.74††† (.18)	26.23 (26.38)	26.96 (22.18)	26.25 (26.27)	13.39 (10.10)	13.24 (10.53)	13.38 (10.11)	-12.87††† (.19)
Panel B: Consistently employed sample														
n	23,100	646	23,746	14,322	255	14,577								
Earnings from wages/salary [a]	25.59 (25.92)	24.35 (16.39)	25.56 (25.72)	13.19 (9.61)	15.20*** (11.24)	13.23 (9.65)	-12.40††† (.19)	26.35 (26.47)	27.11 (22.22)	26.37 (26.37)	14.09 (10.08)	15.42* (11.10)	14.11 (10.09)	-12.27††† (.19)

Note: Earnings from wages/salary[a] in $1,000s. Significance of two-tailed tests of within-sex differences between movers and non-movers denoted: *p < .05 **p < .01 ***p < .001.

Significance of two-tailed tests of differences between all husbands and all wives denoted: †p < .05 ††p < .01 †††p < .001.

Standard deviations are in parentheses.

Models are estimated with STATA 9.1 using weights to correct for sampling design effects and sample attrition.

Hypotheses 1, 2 and 4 specify that b_3 in the reduced-form model is confounded with gender differences in the distribution of individual, family and occupational characteristics, such that the successive addition of controls for each of these characteristics will reduce the magnitude and/or significance of the coefficient. Thus, we test Hypotheses 1, 2 and 4 through the successive addition of the individual-, family- and occupation-level variables. These hypotheses are supported if the additions reduce the magnitude and/or significance of b_3. As a second test of Hypothesis 4, we estimate a model in which we substitute occupational fixed effects for the measures of occupational characteristics. The fixed-effects model specifications add a set of occupational dummy variables that control directly for sex differences in occupational allocation, rather than relying on our occupational characteristic measures to capture the consequences of that segregation.

We test Hypothesis 3 by estimating a second set of models that add SEX*MOVE*k interactions to the complete additive model. If these interactions are statistically significant, it means that the given characteristic, k, conditions the migration effect in a sex-specific way. Finding such conditional effects would support the gender-role explanation for sex differences in the labor force returns to family migration.

Descriptive Results

Marginal Sex Differences in the Association between Migration and Labor Force Outcomes

Table 1 presents descriptive statistics, based on both the full sample and the consistently employed sample, for employment and earnings at the start (t-1) and end (t) of each interval, separately by sex and migration status. The descriptive statistics indicate significant male-female differences in employment consistency and earnings and in mover-stayer differences in those outcomes.

The earnings of women and men differ significantly at both the beginning and end of each one-year interval, and in both the full and consistently employed samples. The statistics for the full sample in Panel A of Table 1 show that at the start of each interval, wives earn $12,737 less than husbands. This average sex gap increases slightly at the end of each interval to $12,870. This sex difference is slightly reduced but still highly significant among those who are consistently employed (see Panel B). In addition, among the full sample, women are significantly less likely than men to remain employed (90 percent vs. 99 percent) over each one-year interval, regardless of their migration experience. Mover-stayer differences in employment exist for women only: wives who move are less likely to remain employed than wives who do not move (69 percent vs. 90 percent), and among wives who remain consistently employed, movers have significantly higher earnings than stayers at both t-1 and t.

The descriptive statistics presented in Table 2 provide preliminary evidence that migration has disparate effects on the labor force outcomes of married men and women. The values in the Stayers and Movers columns represent the average change in the given dependent variable over the one-year interval for the

Table 2: Mover-Stayer Differences by Sex and Wife-Husband Difference-in-Difference in Labor Force Characteristics

	Husbands			Wives			Wife-Husband Difference-in-Difference
	Stayers μ_S	Movers μ_M	Mover-Stayer Difference $D_H = (\mu_M - \mu_S)_H$	Stayers μ_S	Movers μ_M	Mover-Stayer Difference $D_W = (\mu_M - \mu_S)_W$	$D_W - D_H$
Panel A: Full sample							
n	23,392	655	24,047	15,909	371	16,280	
Proportion remaining employed	.99 (.10)	.99 (.11)	.00 (.00)	.90 (.29)	.69 (.46)	-.22*** (.02)	-.22*** (.00)
Change in earnings from wages/salary[a]	.74 (15.69)	2.70 (15.05)	1.96** (.72)	.67 (5.01)	-.08 (5.20)	-.76** (.29)	-2.72*** (.79)
Panel B: Consistently employed sample							
n	23,100	646	23,746	14,322	255	14,577	
Change in earnings from wages/salary[a]	.76 (15.75)	2.76 (15.10)	2.00** (.72)	.89 (4.84)	.22 (5.27)	-.68* (.33)	-2.68*** (.82)

Note: Earnings from wages/salary[a] in $1,000s. Standard errors for differences are calculated with the assumption of independence relaxed and controlling for multiple observations from single individuals. *p < .05 **p < .01 ***p < .001, for two-tailed tests.

specified groups. The values in the Mover-Stayer Difference columns represent the estimated impact of migration. Finally, the statistics in the Wife-Husband Difference-in-Difference column are the estimates of the marginal sex gap in the impact of migration.

There are clear sex differences in the influence of migration on labor force outcomes. For men, moving is not significantly related to changes in employment status, but it is significantly related to changes in earnings (see Panel A). On average, the earnings of all men increase over each one-year interval, but those who move experience an average increase of about $2,700 compared to only $740 dollars for non-movers. In contrast, for wives in the full sample, movers fare significantly worse than stayers on both outcomes. Compared to immobile wives, those who move are 22 percentage points less likely to remain employed across any one-year interval and their earnings grow by 760 fewer dollars. The magnitude and significance of these sex differences, which are summarized by the wife-husband difference-in-difference presented in the last column of Table 2, show that wives are significantly less likely than husbands to experience positive labor force returns to migration.

Because earnings are dependent on labor market participation, however, the significant sex differences in the association between migration and earnings may be attributable to the negative effect migration has on employment among married women. This does not appear to be the case because the wife-husband difference-in-difference remains significant in Panel B of Table 2. Controlling for consistent labor force participation has a negligible effect on the earnings penalty attached to migration for married women; it only slightly reduces the magnitude of the wife-husband difference-in-difference estimates for earnings (from -$2,720 to -$2,680). Contrary to the findings of others (LeClere and McLaughlin 1997), our results show that the earnings penalty attached to migration for women is robust to the negative influence migration has on women's labor force attachment.

The Conditioning Effect of Occupational Characteristics

The structural explanation of the sex gap in the labor force consequences of family migration rests on two tenets: 1.) there are occupational characteristics that influence the relationship between migration and career outcomes, and 2.) those characteristics are unequally distributed by sex. Table 3 presents results from an empirical test of the first tenet. This table presents coefficients from reduced-form CDID models that test whether the estimated effect of migration on employment and earnings interacts significantly with the occupational characteristics we measure – prevalence/demand for migration, potential for earnings growth, prevalence of unemployment and geographic ubiquity.

The estimated coefficients for the interactions between MOVE and each of the occupational characteristics from the employment models show that the association between migration and the likelihood that an individual remains employed is conditioned by the prevalence of migration, the unemployment rate and the geographic ubiquity of the individual's occupation (see Panel A). The probability of remaining employed after a move is significantly improved for those employed in occupations characterized by high rates of labor force migration (see column 1). Results also show that the negative effect of migration on employment declines as the occupational unemployment rate increases (see column 3): high rates of unemployment in one's occupation may prompt

moves to areas with improved odds of employment. The geographic ubiquity of an occupation has a negative conditioning effect on the relationship between migration and remaining employed (see column 4). Among those employed in the most geographically ubiquitous occupations, migration has a negative impact on the probability of persistent employment. For those employed in geographically specific occupations (i.e., those with low values on the geographic ubiquity index), movers are more likely than stayers to experience persistent employment.

The geographic ubiquity of an occupation also conditions the influence that migration has on earnings (see Panel B of Table 3). For individuals in geographically

Table 3: Coefficients From Reduced-Form Models of Change in Labor Force Outcomes on MOVE, Occupational Characteristics, and MOVE*Occupational Characteristics

	b	(s.e.)[a]	*b*	(s.e.)[a]	*b*	(s.e.)[a]	*b*	(s.e.)[a]
Panel A: Logit models of change in employment status (1 = remaining employed)								
Intercept	2.86	(.07)***	3.53	(.13)***	3.39	(.05)***	3.76	(.32)***
MOVE	-1.76	(.26)***	-1.97	(.49)***	-1.36	(.15)***	1.38	(1.12)
Prevalence of migration	2.33	(.81)***						
MOVE*Prevalence of migration	6.78	(2.64)***						
Potential for earnings growth			-.19	(.05)***				
MOVE*Potential for earnings growth			.35	(.20)				
Prevalence of unemployment					-7.57	(.76)***		
MOVE*Prevalence of unemployment					5.53	(2.64)*		
Geographic ubiquity							-.80	(.36)*
MOVE*Geographic ubiquity							-2.80	(1.26)*
Panel B: Linear regression models of change in earnings from wages/salary ($1,000s)								
Intercept	-.03	(.16)	-.27	(.46)	1.11	(.09)***	1.14	(.52)
MOVE	1.61	(1.06)***	1.76	(3.54)	1.66	(.90)	-7.13	(2.22)
Prevalence of migration	9.77	(2.00)						
MOVE*Prevalence of migration	-5.45	(12.08)						
Potential for earnings growth			.44	(.20)*				
MOVE*Potential for earnings growth			-.23	(1.46)				
Prevalence of unemployment					-7.46	(1.41)***		
MOVE*Prevalence of unemployment					-11.96	(12.14)		
Geographic ubiquity							-.38	(.61)
MOVE*Geographic ubiquity							9.59	(2.78)***

Note: [a] Estimates are adjusted for multiple observations from single individuals and with robust (Huber-White) standard errors. *p < .05 **p < .01 ***p < .001, for two-tailed tests.

specific occupations, migration is associated with significant declines in earnings. As the geographic ubiquity of the individual's occupation increases, migration is more likely to result in earnings growth.

Sex Differences in Individual, Family and Occupational Characteristics

Table 4 presents evidence supporting the second tenet of the structural explanation – that occupational characteristics are unequally distributed by sex. This table presents descriptive statistics for the independent variables measuring individual, family and occupational characteristics for the full sample of observations separately by sex and migration status. The last column of Table 4 shows the mean sex difference in the distribution of a given variable. Appendix Table 1 presents the parallel set of means and standard deviations for the consistently employed sample.

The descriptive statistics presented in the bottom panel of Table 4 document the existence of significant sex differences in the distribution of occupational characteristics.[7] Compared to men, women are employed in occupations characterized by lower rates of migration, lesser potential for earnings growth, lesser unemployment and greater geographic ubiquity. Although these sex differences are not large in magnitude, they show that occupational sex segregation generates an unequal distribution of occupational characteristics that may lead to sex differences in job opportunities requiring migration and/or in the individual-level labor market consequences of such migration.

There also are significant sex differences in the distribution of individual and family characteristics. The women in the full sample are, on average, younger, less educated and less attached to the labor force than are the men. In particular, the women are less likely than the men to have earned a postsecondary degree, they are less likely to work full-time or more than full-time hours per week, and they have lower average occupational prestige. These sex differences provide preliminary support for Hypothesis 1, that sex differences in the consequences of migration are explained by sex differences in human capital.

The variables measuring family structure differ only slightly between the men and women in the full sample, but more significant sex differences are evident for the indicators of the household division of labor. Women are significantly more likely than men to have spouses who are employed and women contribute less to family income than men.

Multivariate Results

Explanatory Power of the Gendered Distribution of Individual, Family and Occupational Characteristics

Our tests of Hypotheses 1, 2 and one test of Hypothesis 4 focus on the estimated coefficient of the MOVE*SEX interaction in the presence of controls for individual, familial, and occupational characteristics. Table 5 presents the goodness-of-fit statistics and the estimated $b_{\text{MOVE*SEX}}$ for the relevant models of changes in employment (Panel A) and earnings (Panel B).

In the baseline models (models A0 and B0), $b_{MOVE*SEX}$ replicates the observed sex differences in the association between migration and changes in employment/earnings presented in Table 2. The estimated $b_{MOVE*SEX}$ in Model A0 indicates that the odds of consistent employment among women migrants are over 70 percent less (exp(-1.30) = 0.27) than the odds of consistent employment among men migrants. In Model B0 the estimated $b_{MOVE*SEX}$ of -2.68 indicates that moving tends to increase the earnings gap between married men and women by an average of $2,680.

The inclusion of variables measuring age, educational attainment and work hours, as well as the respondents' occupational prestige and logged value of earnings at *t*-1 in Models A1 and B1 significantly improves the fit of each model (increasing the Pseudo-R^2 of the employment model from 0.13 to 0.18 and

Table 4: Means for Individual, Family and Occupational Characteristics by Sex and Migration Status

	Husbands			Wives			
	Stayers	Movers	Total	Stayers	Movers	Total	
	μ_S	μ_M	μ_H	μ_S	μ_M	μ_W	$(\mu_W - \mu_H)$
n	23,392	655	24,047	15,909	371	16,280	
Proportion moved			.03			.02	
Individual characteristics							
Age (range = 20-59)	40.13	34.49**	39.98	38.04	32.68**	37.92	-2.07†††
	(9.48)	(8.61)	(9.50)	(9.02)	(7.95)	(9.04)	(.09)
Educational attainment							
Less than high school diploma	.15	.11**	.15	.09	.07	.09	-.05†††
	(.36)	(.31)	(.35)	(.29)	(.26)	(.29)	(.003)
High school diploma	.33	.24**	.33	.43	.32**	.43	.10†††
	(.47)	(.43)	(.47)	(.50)	(.47)	(.49)	(.005)
Some college but no degree	.22	.24	.22	.23	.31**	.23	.01††
	(.42)	(.43)	(.42)	(.42)	(.46)	(.42)	(.004)
Bachelor's degree	.19	.28**	.19	.16	.18	.16	-.03†††
	(.39)	(.45)	(.40)	(.37)	(.39)	(.37)	(.004)
Graduate or professional degree	.10	.13*	.10	.07	.10	.07	-.03†††
	(.30)	(.34)	(.30)	(.26)	(.30)	(.26)	(.003)
Labor force attachment							
Parttime (< 34 hrs/week)	.15	.14	.15	.54	.52	.54	.38†††
	(.36)	(.35)	(.36)	(.50)	(.50)	(.50)	(.005)
Fulltime (35-44 hrs/week)	.52	.42**	.52	.39	.39	.39	-.13†††
	(.50)	(.49)	(.50)	(.49)	(.49)	(.49)	(.005)
More than fulltime	.32	.44**	.33	.07	.09	.07	-.26†††
(> 45 hrs/week)	(.47)	(.50)	(.47)	(.25)	(.29)	(.26)	(.004)
Occupational prestige	39.08	42.10***	39.16	36.99	39.53***	37.05	-2.11†††
	(14.11)	(14.71)	(14.13)	(13.85)	(14.66)	(13.88)	(.14)

the R^2 of the earnings model from 0.00 to 0.02), but causes the magnitude of $b_{MOVE*SEX}$ to decline only slightly (from -1.30 to -1.28) in the employment model and to significantly increase (-2.68 to -2.97) in the earnings model. Similarly, the inclusion of the additive effects of the variables measuring family structure, recent childbearing experiences and gender roles in Models A2 and B2 improve model fit, but do not lead to the predicted declines in the value or significance of $b_{MOVE*SEX}$. The results therefore do not support Hypothesis 1 (the human capital explanation) or Hypothesis 2 (the gender-role explanation).

Next we test whether sex disparities in the distribution of occupational characteristics generate sex asymmetry in the returns to family migration. Although the set of occupational characteristics we include in this analysis appear to be relatively powerful determinants of changes in employment status (likelihood-

Family characteristics							
Family composition							
Number of children	1.28	1.17*	1.28	1.15	1.02*	1.15	-.13†††
	(1.18)	(1.12)	(1.17)	(1.13)	(1.10)	(1.13)	(.012)
Had a child between *t*-1 & *t*	.07	.14**	.07	.06	.12**	.06	-.005
	(.25)	(.34)	(.25)	(.24)	(.33)	(.25)	(.003)
Spouse's employment status							
Employed	.68	.59**	.68	.99	.98*	.99	.31†††
	(.47)	(.49)	(.47)	(.11)	(.15)	(.11)	(.003)
In labor force but unemployed	.03	.04	.03	.01	.02	.01	-.02†††
	(.17)	(.19)	(.17)	(.10)	(.14)	(.10)	(.001)
Not in the labor force	.29	.37**	.29	.00	.01	.00	-.29†††
	(.45)	(.48)	(.45)	(.04)	(.07)	(.04)	(.003)
Relative earnings	.68	.73**	.68	.40	.38	.40	-.28†††
	(.30)	(.27)	(.30)	(.26)	(.23)	(.26)	(.003)
Occupational characteristics							
Prevalence of migration	.09	.10**	.09	.08	.09**	.08	-.003†††
	(.04)	(.05)	(.04)	(.03)	(.03)	(.03)	(.000)
Potential for earnings growth	2.48	2.58**	2.49	2.38	2.43*	2.38	-.10†††
	(.55)	(.70)	(.55)	(.51)	(.61)	(.52)	(.005)
Prevalence of unemployment	.04	.04	.04	.04	.04*	.04	-.005†††
	(.03)	(.03)	(.03)	(.02)	(.02)	(.02)	(.000)
Geographic ubiquity	.86	.86	.86	.89	.90	.89	.04†††
	(.10)	(.11)	(.10)	(.08)	(.06)	(.08)	(.001)

Note: Significance of two-tailed tests of within-sex differences between movers and non-movers denoted: *$p < .05$ **$p < .01$ ***$p < .001$. Significance of two-tailed tests of differences between all husbands and all wives denoted: $^{\dagger}p < .05$ $^{\dagger\dagger}p < .01$ $^{\dagger\dagger\dagger}p < .001$.

Table 5: Model Fit Statistics and Estimated $b_{SEX*MOVE}$ from Nested Models of Change in Employment and Earnings

Model Specification		Model χ^2/ F	*df*	Pseudo-R^2 or R^2	Likelihood-ratio/ ΔF Test for Nested Models: Model Contrast	$\chi^2/\Delta F$ (*df*)	$b_{SEX*MOVE}$	(s.e.)[a]
Panel A: Binary logit of change in employment status (1 = remaining employed)								
(A0)	SEX, MOVE, SEX*MOVE	902.13	3	.13			-1.30	(.39)***
(A1)	(A0) + Individual characteristics[b]	1314.04	18	.18	A1 vs. A0	832.01 (15)***	-1.28	(.39)***
(A2)	(A1) + Family characteristics	1491.63	24	.20	A2 vs. A1	359.94 (6)***	-1.40	(.40)***
(A3)	(A2) + Occupational characteristics	1567.83	28	.21	A3 vs. A2	78.14 (4)***	-1.45	(.40)***
(A4)	(A2) + Occupation fixed effects	2094.24	203	.23	A4 vs. A2	425.26 (179)***	-1.53	(.42)***
Panel B: OLS regression of change in earnings from wages/salary ($1000)								
(B0)	SEX, MOVE, SEX*MOVE	4.07	3, 4193	.00			-2.68	(.82)***
(B1)	(B0) + Individual characteristics	15.96	18, 4193	.02	B1 vs. B0	6.53 (15, 4175)***	-2.97	(.82)***
(B2)	(B1) + Family characteristics	14.02	24, 4193	.02	B2 vs. B1	.36 (6, 4169)	-2.90	(.83)***
(B3)	(B2) + Occupational characteristics	13.35	28, 4193	.02	B3 vs. B2	.43 (4, 4165)	-2.86	(.83)***
(B4)	(B2) + Occupation fixed effects	3.14	262, 4193	.03	B4 vs. B2	.15 (238, 3931)	-2.89	(.86)***

[a] Estimates are adjusted for multiple observations from single individuals and with robust (Huber-White) standard errors.

[b] Individual characteristics include, in addition to those specified in Table 4, respondents' earnings (logged) and occupational prestige score measured at *t*-1. *p < .05 **p < .01 ***p < .001.

ratio $\chi^2 = 78.14$ for 4 degrees of freedom), adding these controls *increases* the magnitude of the estimated MOVE*SEX interaction from -1.40 to -1.45. This result suggests that the sex gap in the effect of migration on employment is dampened by occupational sex segregation (i.e., women are more likely than men to be in occupations with characteristics that enhance consistent employment). Equalizing the distribution of occupational characteristics, therefore, would increase rather than decrease the female deficit in the likelihood of consistent employment given a long-distance migration. The results from the earnings model are equally unsupportive of the structural explanation. The inclusion of the four occupational characteristics in Model B3 neither improves the fit of the earnings model nor causes any significant change in $b_{MOVE*SEX}$ (the coefficient decreases slightly from -2.90 in Model B2 to -2.86 in Model B3). Contrary to Hypothesis 4, therefore, these measures of occupational characteristics are not significant contributors to sex differences in the financial returns to migration.

As a further test of the structural explanation we estimate an additive model for each outcome in which we substitute occupational fixed effects for the measures of occupational mobility prevalence, unemployment, potential for earnings growth and geographic ubiquity. Because the four occupational characteristics we include in the previous model may not identify or adequately operationalize those aspects of occupational segregation that structure the sex-specific influence of migration on labor force outcomes, we use occupational fixed effects to control directly for sex differences in occupational allocation.

Limited sample sizes within occupations do not permit the identification of an effect for each detailed occupation, so we use a slightly aggregated occupational classification for the fixed-effects models. For the model predicting consistent employment, each occupational category (Census three-digit) is specifically identified if it contains at least 20 person-year observations from the PSID analytical sample and if it has more than one observation of a transition from employment at t-1 to unemployment at t. Occupations that do not satisfy these requirements are collapsed into seven residual categories identified by the major classifications of the 1970 Census occupational coding scheme.[8] This procedure generated 180 separate occupational categories that could be included in the fixed-effects model of employment. For the earnings model, 239 occupational categories are identified by requiring a minimum of 20 person-year observations and collapsing the remaining three-digit occupations into the seven residual categories identified by the 1970 Census occupational coding scheme.

The occupation fixed-effects models are labeled Models A4 and B4 in Table 5. If occupational segregation disproportionately places women in occupations in which the "link between geographic and social mobility" is attenuated (Morrison and Lichter 1988) then controlling for the unequal distribution of men and women across occupational categories should cause $b_{MOVE*SEX}$ to decline in magnitude and/or statistical significance in relation to the estimates from Models A2 and B2. It is clear from the results for Models A4 and B4 that this expectation is not realized. The estimated gender gap in the influence of migration on changes in employment increases to -1.53 in Model A4, indicating that, compared to

men, occupational segregation places women in occupations where migration should benefit their likelihood of continuous employment. This finding indicates that it is men who are disproportionately employed in occupations where the connection between migration and continuous employment is relatively weak; equalizing the distribution of men and women across occupations therefore would further enhance the observed "employment advantage" migrating men enjoy. In contrast, occupational segregation by sex appears to be unrelated to the gender gap in the association between migration and earnings growth. Adding occupational fixed effects to the earnings model does not improve the model fit, and has no effect on the estimated coefficient of the MOVE*SEX interaction. The results from the occupational fixed-effects models are not consistent with the structural explanation.

Table 6: Coefficients from Multiplicative Models of Change in Employment and Earnings

	Remaining Employed at *t*				Change in Earnings between *t* - 1 and *t*			
	Husbands		Wives		Husbands		Wives	
	b_k	(s.e.) [a]	b_k	(s.e.) [a]	b_k	(s.e.) [a]	b_k	(s.e.) [a]
Intercept	3.05	(.96)**	1.14	(.48)***	2.00	(1.25)	2.61	(.61)***
MOVE	-1.40	(.58)*	-2.43	(.46)***	-10.82	(2.93)***	-.24	(.49)
Individual characteristics								
Age (excluded = 20-24)								
25-29	.06	(.34)	.02	(.12)	.07	(.27)	-.32	(.15)*
30-34	.49	(.35)	.22	(.12)	-.36	(.28)	-.17	(.17)
35-39	.40	(.36)	.38	(.13)**	-.28	(.33)	-.39	(.16)*
40-44	.35	(.37)	.29	(.14)*	-1.09	(.34)***	-.44	(.17)**
45-49	.68	(.40)	.68	(.17)***	-1.09	(.33)***	-.77	(.18)***
50-59	.45	(.38)	.58	(.17)***	-.96	(.33)**	-.77	(.19)***
Educational attainment (excluded = Less than high school diploma)								
High school diploma	.49	(.19)**	.37	(.12)**	.29	(.22)	-.08	(.11)
Some college but no degree	.68	(.25)**	.30	(.14)*	.07	(.27)	.11	(.14)
Bachelor's degree	.78	(.34)*	-.02	(.16)	.09	(.39)	.59	(.19)**
Graduate/professional degree	1.87	(.59)**	.05	(.21)	1.43	(.65)*	.88	(.32)**
Missing	1.14	(1.05)	-.05	(.34)	1.22	(.54)*	.61	(.39)
Labor force attachment (excluded = Parttime (< 34 hrs/week))								
Fulltime (35-44 hrs/week)	1.02	(.17)***	.56	(.08)***	-.10	(.52)	.07	(.12)
More than fulltime (> 45 hrs)	1.10	(.22)***	.72	(.18)***	-.85	(.48)	.88	(.34)**
Earnings at *t*-1 (logged)	.00	(.05)	.26	(.03)***	-.59	(.11)***	-.89	(.12)***
Occupational prestige score	.00	(.01)	.01	(.005)**	.02	(.02)	.02	(.01)***
Family characteristics								
Family composition (excluded = No kids)								
1 or 2 kids	-.28	(.22)	.08	(.08)	.30	(.36)	-.13	(.11)
3 or more kids	-.65	(.29)*	-.14	(.12)	.27	(.35)	-.22	(.13)

*Sex Differences in the Conditioning Effects of Individual, Family and Occupational Characteristics: SEX*MOVE*k Interactions*

To test the gender-role explanation of sex asymmetry in family migration, we check for the presence of significant SEX*MOVE*k interactions, where k represents an occupational, individual or familial characteristic (Hypothesis 3). While prior research has supported the gender-role explanation by identifying sex differences in the influence of individual and family characteristics on migration outcomes, extant research has not examined sex differences in the influence of occupational characteristics. Significant interactions between occupational characteristics, migration and sex would add new support to the gender-role explanation for it would provide empirical evidence of an additional set of characteristics not examined in the extant literature – those that operate at the

lad a child between t-1 & t	-.05	(.26)	-1.74	(.09)***	.97	(.32)***	-.78	(.27)***
;pouse's employment status (excluded = Employed)								
In labor force but unemployed	.35	(.45)	-.05	(.28)	-.26	(1.08)	.64	(.38)
Not in the labor force	-.13	(.19)	.21	(.49)	.81	(.42)	-.28	(.52)
:elative earnings	.30	(.58)	.60	(.18)***	-2.24	(1.05)***	-.71	(.20)***
ccupational characteristics								
'revalence of migration	2.30	(3.39)	-3.28	(1.51)*	10.55	(3.92)**	5.76	(2.43)*
'otential for earnings growth	.17	(.27)	-.19	(.07)**	-.23	(.35)	-.18	(.18)
'revalence of unemployment	-12.29	(2.13)***	-3.75	(2.17)	3.97	(3.56)	-1.03	(2.52)
;eographic ubiquity	-.04	(.65)	.26	(.41)	.56	(1.05)	.02	(.46)
gnificant MOVE*k interaction parameter estimates								
1OVE*Educational attainment								
MOVE*High school diploma					.36	(1.09)		
MOVE*Some college but no degree					1.11	(1.54)		
MOVE*Bachelor's degree					4.78	(1.45)***		
MOVE*Graduate or professional degree					2.53	(4.16)		
MOVE*Missing					1.23	(2.01)		
1OVE*Labor force attachment								
MOVE*Fulltime (35-44 hrs/week)							-.84	(.81)
MOVE*More than fulltime (> 45 hrs/week)							-2.49	(1.26)*
1OVE*Spouse's employment status								
MOVE*In labor force but unemployed							-.80	(2.10)
MOVE*Not in the labor force							-7.80	(.76)***
1OVE*Prevalence of migration			11.23	(4.74)*				
1OVE*Prevalence of unemp.	21.60	(9.89)*						
1OVE*Geographic ubiquity					12.40	(3.43)***		

[a] Estimates are adjusted for multiple observations from single individuals and with robust (Huber-White) standard errors. *$p < .05$ **$p < .01$ ***$p < .001$.

level of the occupation or labor market – that are treated asymmetrically in the context of family migration decisions.[9]

To test for significant interactions between each covariate, migration experience and sex, we simplify the analysis by first splitting the sample by sex and then testing for two-way MOVE*k interactions in sex-specific models. Table 6 presents the estimated coefficients for the sex-specific employment and earnings models; all main effects and significant MOVE*k interactions are displayed.

There are two main conclusions that can be drawn from these results. First, with respect to labor force outcomes, the individual, familial and occupational characteristics of husbands and wives are treated differently within families. The sex differences are illustrated by comparing the estimated coefficients from the sex-specific models. The educational attainment of men is a more significant and positive determinant of both consistent employment and earnings growth than is the educational attainment of women. Also, labor force attachment is a positive indicator of consistent employment for both men and women, but the magnitude of the estimated effect is greater for men. Earnings level and occupational prestige have significant influences on consistent employment for women only, i.e., consistent employment is more likely among high-earning women employed in high-prestige occupations, but men remain employed regardless of their earnings level or occupational prestige. Having a child within the previous year has a negative effect on the labor force outcomes for women only: it depresses both the odds of continuous employment as well as the earnings growth of women who remain employed. In contrast, the recent birth of a child is positively associated with the earnings growth of husbands. Also, relative contribution to family income and potential for earnings growth affect the likelihood of consistent employment for women only; the odds of employment for men are not sensitive to these covariates.

The second conclusion supported by these results is that the influence of migration on labor force outcomes is conditioned by separate sets of covariates for men and women. For women, the association between migration and continuous employment is positively influenced by the prevalence of migration within the occupation at t-1. Among women employed in occupations with immobile labor forces, migration significantly increases the odds of unemployment, but among women working in occupations characterized by a high rate of labor force transience, the association between migration and continued employment becomes positive. This finding indicates that the rate of mobility among the work force in female-dominated occupations may be a proxy for the prevalence of characteristics that enable easy job replacement.

For married men, the occupational unemployment rate conditions the association between migration and the likelihood of continuous employment. More specifically, the results show that for men employed in high-unemployment occupations the odds of consistent employment are significantly improved among migrants and significantly depressed among non-migrants. The prospect (or experience) of unemployment for married men appears to spur family migration and this enhances the odds of men remaining employed. The results also indicate that the geographic ubiquity of a man's occupation enhances the earnings returns

to migration. Among men who remain consistently employed, movers experience significant increases in earnings, especially if they are employed in geographically ubiquitous occupations. So, although women are more likely to be employed in geographically ubiquitous occupations (see Table 4 and Appendix Table 1), this occupational characteristics influences the association between migration and career advancement for men only.

Additional empirical support for the gender-role explanation is the existence of significant three-way interactions between sex, migration and individual and family characteristics *in the context of controls for the distribution of occupational characteristics*. We find that educational attainment influences the economic returns to migration for men but not for women. Although advanced education is associated with increased earnings for both men and women, only for men does educational attainment (specifically the earning of a bachelor's degree) enhance the effect migration has on earnings growth. If they migrate, men with a bachelor's degree earn an additional $4,782 a year compared to men without a high school diploma. In contrast, educational investments do not enhance the likelihood that a family migration will yield earnings growth for women.

Perhaps the most direct evidence of the influence of gender roles on family migration decisions and outcomes is the significance of the MOVE*k interactions for labor force attachment and spouse's employment status in the earnings model for wives. The significant negative values of both interactions indicate that family migration is unlikely to benefit married women even when their labor force attachment is high in either absolute terms or in relation to their spouse. Contrary to the human capital theory of migration (Sjaastad 1962), our results show that for women who are strongly attached to the labor force (i.e., who work more than full-time hours), migration is associated with particularly steep declines in earnings. Controlling for all other individual, family and occupational characteristics, among women who work 45 hours or more per week at the start of any one-year interval, the estimated decline in earnings associated with migration is $2,490 *greater* than for women who work part-time. Furthermore, we find that the negative association between family migration and women's earnings growth is particularly strong among women with husbands who are not in the labor force prior to the migration. Compared to women in dual-earner couples, women with unemployed husbands lose an additional $7,800 in annual earnings as a result of migration.

Summary

In order to summarize our results, we use a standardization procedure to distill the empirical evidence regarding the central point of contention among the three competing explanations of sex asymmetry in the career consequences of family migration: if sex differences in the returns to migration are due to sex differences in the distribution of characteristics, as is posited by the human capital and structural explanations, or to sex differences in the influence of characteristics, as is posited by the gender-role explanation.

We summarize the empirical evidence by estimating the wife-husband difference in the mover-stayer difference in the two labor force outcomes under

two counterfactual scenarios. The first scenario simulates the counterfactual specified by the human capital and structural hypotheses (i.e., it estimates the returns to migration if there were no sex differences in the distribution of individual, family and occupational characteristics). To do this we use the sex-specific coefficients (from Table 6) and the male-specific mean values for individual, family and occupational characteristics (from Table 4 and Appendix Table 1) to estimate sex differences in the effect of migration on labor force outcomes. The second scenario simulates the counterfactual specified by the gender-role explanation (i.e., it estimates the returns to migration if there were no sex differences in the relationship between the independent variables and the outcomes). To impose this counterfactual, we use the male-specific set of coefficients and the sex-specific mean values for individual, family and occupational characteristics to again estimate the sex differences in the effect of migration on the labor force outcomes.

The results of this standardization exercise are presented in Table 7: Panel A presents the results for the effect of migration on the probability of consistent employment, and Panel B presents the results for changes in earnings. The first row of each panel presents the unstandardized estimates of the effect of migration on labor force outcomes for husbands and wives. These estimates are calculated using the sex-specific coefficients and the sex-specific means for the full set of covariates. The unstandardized wife-husband difference-in-difference estimates reflect the observed female disadvantage in the effect of family migration on employment consistency and earnings growth.

If the female disadvantage is attributable to sex differences in the distribution of individual, family or occupational characteristics, equalizing the distribution of the influential characteristics should cause the estimated wife-husband difference-in-difference to decline in magnitude. As is evident in the second through fifth rows of each panel in Table 7, imposing an equal distribution of neither individual, nor family nor occupational characteristics accomplishes a significant decline in the sex gap in the effect of migration on either employment or earnings.

If, however, the female disadvantage is attributable to the differentiating influence of gender roles, then equalizing the effects of individual, familial and occupational characteristics on labor force outcomes should cause a significant decline in the estimated wife-husband difference-in-difference. As the results presented in the last row of each panel in Table 7 show, this expectation is strongly supported by the empirical results. If women's characteristics had the same influence as men's on labor force outcomes, the sex gap in the association between migration and employment would disappear (0.001), and the sex gap in the earnings benefits of migration would switch to favor women by an average of $290 per year.

Conclusion

The results of this analysis reinforce the conclusion that married women are significantly less likely than married men to gain labor market benefits from family

Table 7: Predicted Sex Differences in the Mover-Stayer Difference in the Labor Market Outcomes Given Counterfactual Combinations of Sex-Specific Coefficients and Means

	Husbands			Wives			Wife-Husband Difference-in-Difference
	Stayers	Movers	Mover-Stayer Difference	Stayers	Movers	Mover-Stayer Difference	
	$\hat{y}_S$	$\hat{y}_M$	$D_H = (\hat{y}_M - \hat{y}_S)_H$	$\hat{y}_S$	$\hat{y}_M$	$D_W = (\hat{y}_M - \hat{y}_S)_W$	$D_W - D_H$
Panel A: Probability of remaining employed							
Sex-specific effects *							
Sex-specific means	1.00	.98	-.01	.93	.74	-.18	-.17
+ Individual characteristic means of husbands	1.00	.98	-.01	.94	.79	-.15	-.14
+ Family characteristic means of husbands	1.00	.98	-.01	.93	.74	-.18	-.17
+ Occupational characteristic means of husbands	1.00	.98	-.01	.95	.70	-.24	-.23
Individual, family and occupational characteristic means of husbands	1.00	.98	-.01	.96	.76	-.20	-.19
Male effects * Sex-specific means	1.00	.98	-.01	1.00	.98	-.01	.00
Panel B: Change in earnings from wages/salary ($1000)							
Sex-specific effects *							
Sex-specific means	.76	2.15	1.39	.90	.11	-.79	-2.18
+ Individual characteristic means of husbands	.76	2.15	1.39	1.28	-.24	-1.52	-2.90
+ Family characteristic means of husbands	.76	2.15	1.39	.61	-2.44	-3.05	-4.44
+ Occupational characteristic means of husbands	.76	2.15	1.39	.89	.10	-.79	-2.18
Individual, family and occupational characteristic means of husbands	.76	2.15	1.39	.98	-2.79	-3.78	-5.16
Male effects * Sex-specific means	.76	2.15	1.39	1.28	2.96	1.68	.29

migration. In particular, the evidence is overwhelming that family migration is associated with inconsistent employment and declining earnings for women. For men, on the other hand, family migration is associated with earnings growth.

Attempts to explain the sex gap in the returns to family migration have focused almost exclusively on sorting out the empirical evidence in favor of either the microeconomic or the family gender-role explanations. We argue that inattention to a third explanatory framework – the structural perspective – has left the literature with an incomplete model of family migration and only partial tests of the microeconomic and gender-role explanations. In this paper we address that gap in the literature by more fully developing the structural explanation, proposing measures of theoretically important measures of labor markets characteristics and reporting the results of a thorough test of the extent to which sex differences in the career consequences of family migration can be attributed to the uneven distribution of occupational characteristics that accompanies the significant level of occupational segregation by sex in the United States.

The results do not support the structural explanation. Although we show that three of the four occupational characteristics we identify are unequally distributed by sex and condition the association between migration and the labor market outcomes, controls for these occupational characteristics do not explain the sex gap in the returns to migration. Our investigation of the reason for this lack of explanatory power yield results that are consistent with the gender-role explanation: the influence of occupational characteristics on the connection between migration and labor market outcomes operates very differently for married men and married women.

By including occupational characteristics in our models, we have improved the specification of the relationship between family migration and labor market outcomes, and thereby provide a more rigorous test of the human capital and gender-role explanations of the sex gap in the returns to migration. In the presence of controls for occupational characteristics, we find no support for the human capital explanation. Although there are significant sex differences in the educational attainment, labor force attachment and earnings potential of the respondents in our sample, our standardization procedure shows that equalizing the distribution of human capital would not lead to a more equal distribution of the returns to migration. Similarly, our results do not support the proposition that men and women would be equally likely to benefit from family migration if the division of labor within the family was equal. Instead, our results show that the sex disparity in the impact of family migration on employment and earnings is due to the differential influence of women's and men's characteristics.

Our results support the notion that families migrate in order to enhance husbands' careers, not wives' careers. Highly educated men reap a larger monetary benefit from migration compared to their less educated counterparts. And if a man is facing high unemployment rates, a move will significantly increase his likelihood of being employed a year later. On the other hand, among families who move, women's earnings potential and local labor market conditions have no influence on her work outcomes a year after migration. Instead, it seems that women who are the most committed to their jobs and who are the main

breadwinners in their families – those working more than full-time and those with non-working husbands – are the ones who face the largest earnings penalty as a result of family migration.

Notes

1. The analytical sample includes duplicated family-level variables only for those cases where individual-level data files are available for both spouses in a sampled family. Because not all spouses contribute individual-level data to the PSID, the analytical sample is not strictly a sample of paired individuals.

2. We also examined two other dependent variables – hours worked per week and occupational prestige score – but found no evidence of sex differences in the association between these labor market outcomes and family migration. Results are available from the authors.

3. Long-distance migration is coded as either moves between metropolitan areas, moves between metropolitan and non-metropolitan areas, or county-to-county moves for those who did not live in a metropolitan area in either of the adjacent years in each year-to-year comparison.

4. Childbearing is the only covariate that is measured during the interval of observation (i.e., contemporaneous to migration experience and changes in employment and earnings).

5. Census data for 1970, 1980 and 1990 were extracted from the IPUMS using the following samples: 1970 Form 1 Metro, 1980 5% State (A Sample), 1990 5% State.

6. The occupation-specific measure of geographic ubiquity is defined as

$$1 - \frac{\sum_{i=1}^{n} (t_i \left| p_i - P \right|)}{2TP(1-P)}$$

where t is the total population in metropolitan area i, T is the total population, p_i is the proportion of metropolitan area i employed in occupation j, and P is the proportion of the total population in occupation j. The index is calculated over 121 metropolitan areas that are harmonized across the 1970-1990 Censuses. Because our goal is to produce a measure that is comparable across occupations rather than a complete characterization of the geographic dispersion of occupations in the United States, non-metropolitan areas are excluded from the calculation.

7. The described pattern of sex differences in individual-, family- and occupation-level variables is replicated in the consistently employed sub-sample (see Appendix Table 1).

8. The residual occupational categories identify 1.) professional, technical and kindred workers, 2.) sales workers and managers and administrators, except farm, 3.) clerical and kindred workers, 4.) craftsmen and kindred workers, 5.)

operatives, including transport, 6.) laborers, including farm, and 7.) service workers, including private household.

9. This interpretation rests on the assumption that the occupational characteristic variables we include are internally consistent; specifically, that they measure the same characteristic for both male- and female-dominated occupations. If this assumption does not hold, then significant SEX*MOVE*k interactions may reflect qualitative differences in male- and female-dominated occupations rather than the influence of gender roles.

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Appendix Table 1: Means for Individual, Family and Occupational Characteristics by Sex and Migration Status, Consistently Employed Sample

	Husbands			Wives			
	Stayers	Movers	Total	Stayers	Movers	Total	
	μ_S	μ_M	μ_H	μ_S	μ_M	μ_W	$(\mu_W - \mu_H)$
n	23,100	646	23,746	14,322	255	14,577	
Proportion moved			.03			.02	
Individual characteristics							
Age (range = 20-59)	40.15	34.53**	40.01	38.31	32.84**	38.22	-1.79†††
	(9.48)	(8.59)	(9.50)	(8.97)	(7.96)	(8.98)	(.10)
Educational attainment							
Less than high school diploma	.15	.10**	.15	.09	.07	.09	-.06†††
	(.36)	(.31)	(.35)	(.29)	(.25)	(.29)	(.003)
High school diploma	.33	.24**	.33	.43	.31**	.43	.10†††
	(.47)	(.43)	(.47)	(.50)	(.46)	(.49)	(.005)
Some college but no degree	.22	.24	.22	.23	.31**	.24	.01††
	(.42)	(.43)	(.42)	(.42)	(.47)	(.42)	(.004)
Bachelor's degree	.19	.28**	.20	.16	.18	.16	-.03†††
	(.39)	(.45)	(.40)	(.37)	(.39)	(.37)	(.004)
Graduate or professional degree	.10	.13*	.10	.07	.13**	.07	-.03†††
	(.30)	(.34)	(.30)	(.26)	(.34)	(.26)	(.003)
Labor force attachment							
Parttime (< 34 hrs/week)	.15	.14	.15	.52	.44*	.52	.37†††
	(.36)	(.35)	(.36)	(.50)	(.50)	(.50)	(.005)
Fulltime (35-44 hrs/week)	.52	.41**	.52	.41	.45	.41	-.11†††
	(.50)	(.49)	(.50)	(.49)	(.50)	(.49)	(.005)
More than full-time	.33	.45**	.33	.07	.11*	.07	-.26†††
(> 45 hrs/week)	(.47)	(.50)	(.47)	(.26)	(.32)	(.26)	(.004)
Occupational prestige	39.17	42.04***	39.25	37.33	41.13***	37.40	-1.85†††
	(14.12)	(14.61)	(14.14)	(13.90)	(14.72)	(13.93)	(.15)

Appendix Table 1 *(continued)*

Family characteristics							
Family composition							
Number of children	1.28	1.17*	1.28	1.14	.98*	1.14	-.14†††
	(1.17)	(1.12)	(1.17)	(1.12)	(1.04)	(1.12)	(.012)
Had a child between *t*-1 & *t*	.07	.14**	.07	.05	.07	.05	-.02†††
	(.25)	(.35)	(.25)	(.21)	(.25)	(.21)	(.002)
Spouse's employment status							
Employed	.68	.59**	.68	.99	.98	.99	.31†††
	(.47)	(.49)	(.47)	(.11)	(.15)	(.11)	(.003)
In labor force but unemployed	.01	.01	.01	.01	.01	.01	-.004†††
	(.11)	(.09)	(.11)	(.08)	(.11)	(.08)	(.001)
Not in the labor force	.02	.03*	.02	.003	.01	.003	-.02†††
	(.13)	(.17)	(.13)	(.05)	(.08)	(.05)	(.001)
Relative earnings	.68	.73**	.68	.41	.43	.41	-.27†††
	(.30)	(.27)	(.30)	(.26)	(.24)	(.26)	(.003)
Occupational characteristics							
Prevalence of migration	.09	.10**	.09	.08	.10**	.08	-.003†††
	(.04)	(.05)	(.04)	(.03)	(.04)	(.03)	(.000)
Potential for earnings growth	2.48	2.58**	2.49	2.37	2.44*	2.37	-.12†††
	(.55)	(.68)	(.56)	(.51)	(.63)	(.51)	(.006)
Prevalence of unemployment	.04	.04	.04	.04	.03**	.04	-.005†††
	(.03)	(.04)	(.03)	(.02)	(.02)	(.02)	(.000)
Geographic ubiquity	.86	.86	.86	.90	.90	.90	.04†††
	(.10)	(.11)	(.10)	(.08)	(.06)	(.08)	(.001)

Note: Significance of two-tailed tests of differences between movers and non-movers denoted: *$p < .05$ **$p < .01$ ***$p < .001$. Significance of two-tailed tests of differences between all husbands and all wives denoted: †$p < .05$ ††$p < .01$ †††$p < .001$.