Testing the Family Investment Hypothesis: Theory and Evidence

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Abstract

This paper presents a new test for the family investment hypothesis (FIH). We show that a simple two-period labor supply model produces testable implications on the work hours and occupational choices for married women. In credit-constrained households, married women financially support their families by working in dead-end jobs that do not necessarily require much skill. The support decreases as their families overcome credit-constraints. We analyze the occupation choices for married women using a first-order Markov switching model. Our findings, based on the matched March Current Population Survey (CPS) for 1996-2002, are consistent with the FIH. We replicate the annual hours worked specifications used in previous papers and demonstrate that the conventional results get reversed when the sample is confined to women who work in dead-end jobs.

Keywords: Family Investment Hypothesis, Immigration, Occupation Mobility

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1 Introduction

This paper presents a new test for the family investment hypothesis (FIH). In credit-constrained households some family members participate in the labor market to financially support their families. However, these family members would have not worked if their families were not credit-constrained. As a consequence the support provided by these family members will decrease as their families overcome credit-constraints. The support usually takes the form of working in dead-end jobs that do not necessarily require much skill. These predictions enable one to test the FIH by comparing the labor supply of secondary workers in credit-constrained families with that in families that are not credit-constrained.

In the literature, researchers have found a simple way of separating out credit-constrained families from those who are not by exploiting the immigration status of families.[1] A common assumption made is that recent immigrant families are more likely to be credit-constrained than native families or other immigrant families who arrived earlier.[2] This is because, upon entry to the United States, source country skills are not perfectly transferable and immigrants face restrictions on funding the accumulation of host country specific skills. It gives rise to specialization among couples where primary workers (usually husbands) invest in acquiring U.S. specific skills and secondary workers (usually wives) take on low-skilled jobs to support their families in the interim.[3] Once primary workers start assimilating into the U.S. labor market, secondary workers reduce work hours or withdraw from the labor force.

Testing the FIH is of interest because of the following three reasons. First, it helps policy makers to understand the labor market behavior of family members in credit-constrained, not limited to immigrant, households. Second, while a large literature investigates the FIH (e.g., Long, 1980; Baker and Benjamin, 1997; Blau, Kahn, Moriarty, and Souza, 2003; Cobb-Clark and Crossley, 2003; among others), the testing procedure has not been formally established by economic theory. Third, the evidence on the FIH has been controversial. While Baker and Benjamin (hereafter, BB), using the 1986 and 1991 Canadian Survey of Consumer Finances, find that foreign-born women's labor supply patterns are consistent with the FIH; Blau, Kahn, Moriarty, and Souza (hereafter, BKMS), using the U.S. 1980 and 1990 Census data, find no support for the FIH.

[1] We use the terms "foreign-born person" and "immigrant" interchangeably. Our sample possibly includes aliens in an illegal status.

[2] Analyses based on this assumption, however, will fail if one cannot separate the effects of credit-constraints from other effects that are specific to immigrants' experience. Cobb-Clark and Crossley (2003) discuss that imperfect skill transferability (Chiswick, 1978), cultural differences in the family roles toward working (Reimers, 1985; Antecol, 2000), or non-random migration decisions (Borjas, 1987) may lead the behavior of immigrants and natives to differ.

[3] Over 70% of foreign-born population come to the United States under the family unification immigrant policy and most of these family migrants are female (Ozden and Neagu, 2008).

This study improves upon previous research in several ways. First, we develop a two-period labor supply model for married women that provides testable implications for testing the FIH. We consider an economy with two kinds of jobs: career-oriented and dead-end jobs. Females are heterogeneous in that they have different labor market productivity and preference for work. Married women with low productivity and low taste for work do not work unless their families are credit-constrained. Among those women, more immigrant females participate in the labor market since their families are more likely to be credit-constrained than native ones. As the credit-constraint problems get resolved, more immigrant females in dead-end jobs will drop out of labor force than their native counterparts. A test of the FIH is, therefore, to look at the immigrant-native difference in the occupation mobility of married women working in dead-end jobs in response to the increase of husband's earnings and family non-labor income.

Second, previous studies test the FIH by comparing the average annual hours worked of foreign-born women with those of native-born women without conditioning on occupations. For example, BKMS (2003) find that immigrant women work less hours than comparable natives upon arrival, but eventually overtake the labor supply of natives. We argue that the test has to be limited to immigrant and native women who work in dead-end jobs. The role of dead-end jobs has been noted in most previous papers, but occupational status has received little attention in testing the FIH. We show that, by replicating previous specifications using our data, one can reproduce the findings of other U.S. studies and that these results get reversed when the sample is confined to women working in dead-end jobs.

Third, this paper uses longitudinal data to characterize the dynamic feature of occupation choices. We specify a first-order Markov switching model with three occupation states (not working, working in dead-end jobs, and working in career-oriented jobs) using the matched March Current Population Survey (CPS). We explicitly investigate whether foreign-born women in dead-end jobs quit working with increased stay in the United States controlling for their spousal occupation status and earnings, family non-labor income, and own and spousal demographic variables. We find that immigrant women working in dead-end jobs have significantly higher probability of dropping out of the labor force than their native counterparts.

The paper proceeds as follows. Section 2 develops a two-period labor supply model for married women and presents its implications for work hours and occupational choices. It discusses how our approach differs from previous literature. Section 3 introduces the data sets used for this study. They include the matched March CPS as well as an occupation state variable that classifies occupations into career-oriented and dead-end jobs. Section 4 proceeds with empirical specification and estimation of the model. We specify a parametric first-order Markov switching model using multinomial logit. We discuss the immigrant-native difference in transition probability estimates. Section 5 replicates the annual hours worked specification using the CPS. We compare the results from the full sample and the sample confined to women in dead-end jobs. Section 6 concludes.

2 Testing the Family Investment Hypothesis

This section carefully develops a test for the FIH by introducing a simple two-period labor supply model for married women. This model provides three testable implications for the FIH. We argue that the FIH can be tested by looking at the sample of women working in dead-end jobs rather than the entire sample, which has been neglected in previous literature.

2.1 Labor Supply of Married Women: Theory

Consider a two-period model. The labor market is competitive and offers two kinds of occupations. The first occupation is a career-oriented job. Individuals working in career-oriented jobs earn w_1 in the first period (when young) and w_2 ($> w_1$) in the second period (when old) if they continue to work. The second occupation is a dead-end job. The wages in dead-end jobs are set to w_0 regardless of labor market experience. We assume that the discounted lifetime earnings of working in career-oriented jobs are greater than those of working in dead-end jobs. That is $w_1 + w_2/(1+r) > w_0 + w_0/(1+r)$ where r is a discount rate.

Assume that husbands and wives are primary and secondary workers, respectively. All males participate in the labor market, but there is sample selection among females. Women are heterogeneous. They have different labor market productivity and preference for leisure. For simplicity, consider four types of females: high/low productivity and high/low taste for work. Suppose that, given the wage structure, high productivity (HP) and low productivity (LP) females work in career-oriented and dead-end jobs, respectively, if they choose to work. Other things equal, females with high taste for work (HW) are more likely to work than those with low taste for work (LW).

Females choose to work when their non-labor income is low, given their productivity and preference.[4] Non-labor income consists of husband's earnings and family non-labor income. Suppose that there is a threshold for non-labor income such that LP-LW females with non-labor income below the threshold work. A family is credit-constrained when the wife's non-labor income is below the threshold. Suppose

[4] We abstract from bargaining within married couples.

that while some families are credit-constrained in the first period, none are in the second period. Then, in the first period, some women who would have not worked work because their non-labor income is too low. In the second period, these women drop out of the labor force. The majority of these women are LP-LW females since LP-HW or HP females are likely to work in both periods. To test the FIH, one needs to look at the changes in the labor market behavior of LP-LW females.

In practice, it is difficult to separate LP-LW females from LP-HW females, although it is possible to identify LP females among working females. Hence, we develop a test based on working LP females. The FIH accompanied by a conventional assumption that immigrant households are more likely to be credit-constrained provides several testable implications. First, among working LP females, immigrant women work longer hours than native women in the first period. This is because among working LP females there are more credit-constrained immigrant households than native ones. Second, among LP females working in the first period, the decrease in work hours in the second period is greater for immigrant women than it is for native women. Finally, among LP females working in the first period, immigrant women are more likely to quit in the second period relative to native women. The second and third implications are due to the fact that LP-LW women drop out of the labor force. The first two implications are tested in Section 5 and the last one in Section 4.

2.2 Previous Literature

Previous papers have tested the first and second implications neglecting the woman's occupational status. According to our model, the FIH cannot be tested based on the entire female sample. BB (1997) test the FIH against an alternative hypothesis, the pricing model, using the 1986 and 1991 Canadian Survey of Consumer Finances. The pricing model explains the observed labor supply pattern of immigrant women by the labor supply responses to each spouse's wages. They reject the pricing model based on the fact that their estimated hours/wage elasticities are too large. They have tried to disentangle immigrant specific effects by looking at the composition in family nativity. They show that immigrant women married to native men, who are assumed to not be credit-constrained, behave like native women.

BKMS (2003) use the 1980 and 1990 U.S. Census data and reject the FIH. They find that immigrant women work less hours than comparable natives upon arrival, but eventually overtake the labor supply of natives, which conflicts with the FIH. They also find that the positive assimilation profiles for women and men have similar magnitudes. Blau, Kahn, and Papps (2008), using the 1980, 1990, and 2000 Census data, find that source country characteristics impact the labor supply assimilation profiles (annual hours worked) of immigrant wives, but not immigrant husbands.

Goldner, Gotlibovski, and Kahana (2009) provide the most recent evidence for the FIH using the 1980 and 1990 U.S. Census. They reject the FIH. They compare the labor market outcomes between married and single immigrants with the assumption that under the FIH, only married immigrant women finance household consumption. Then, married women should work longer on arrival and reduce their hours with continued stay in the host country relative to single immigrants. To account for bias due to selection into marriage, they use the difference-in-difference estimator by comparing married and single natives.

Studies that test the FIH in other countries provide mixed results. Cobb-Clark and Crossley (2004), using data from Australia, identify primary and secondary workers in immigrant families based on 'points' which are assigned in accordance to an individual's skill set. They find support for the FIH in households where the primary worker is male, but reject the FIH in households where the primary worker is female. Basilio, Bauer, and Sinning (2009) do not support the FIH based on data from West Germany. Goldner, Gotlibovski, and Kahana (2009) also use the Israeli Labor Force Survey (LFS) and Income Survey (IS) for the years 1991-2004 and reject the FIH in Israel.

There are studies that examine the occupational status of immigrants, but they do not link the findings to testing the FIH. Powers and Seltzer (1998) and Powers, Seltzer, and Shi (1998) analyze the occupational status of undocumented migrants using data from the Legalized Population Surveys. By comparing first jobs in the United States, occupations held at the time of legalization, and occupations after legalization was granted, they find an upward trend in job quality. Akresh (2006) and Akresh (2008) using data from the New Immigrant Survey (which follows immigrants who have received their green cards) analyze last jobs held in their home country, first jobs in the United States, and current jobs. She finds that immigrants exhibit a U-shaped pattern of economic assimilation: they experience downward mobility on arrival (first job) and upward mobility (current job) in their occupational status.

3 Data

This section introduces an occupation state variable provided by the Occupational Information Network database (O*Net) as well as the matched March CPS. By exploiting the two-year panel structure of the CPS, we tabulate women's occupation in year 2 conditional on the occupation in year 1 by husband's earnings. It shows that the transition probabilities from dead-end jobs to not working status are sensitive to husband's earnings especially for immigrant women, which is consistent with the FIH. We also discuss summary statistics.

3.1 The Job Zone Variable from the O*Net

We introduce the Specific Vocational Preparation (SVP) which the job zone variable is based on. The SVP as defined by the U.S. Department of Labor is the amount of lapsed time required by a typical worker to learn the techniques, acquire the information, and develop the facilities needed for average performance in a specific job-worker situation. Specific vocational training includes vocational education, apprenticeship training, in-plant training, on-the-job training, and essential experience in other jobs. The SVP score ranges from 1 to 9 (both inclusive). A job with a SVP score of 1 requires a skill level that can be obtained by short demonstration. A job with a SVP score of 9 requires at least 10 years of training. The Appendix lists the overall experience, education, job training, and examples of occupations for each job zone provided by the O*Net, which is part of the U.S. Department of Labor Employment and Training Administration.[5]

We focus on jobs with SVP scores of less than 4. These jobs are defined as the job zone 1 occupations by the O*Net.[6] These jobs require from no preparation to up to three months of training. Job zone 1 occupations include a large number of less complex service occupations, as well as materials handlers and machine/equipment tenders or operators. For example, these jobs include amusement and recreation attendants, bartenders, counter and rental clerks, cashiers, highway maintenance workers, couriers and messengers, lobby attendants, parking enforcement officers, phlebotomists, refuse and recyclable material collectors, solderers, taxi drivers, ticket takers, ushers, waiters/waitresses, and yard workers.

In this study, we classify dead-end jobs as the occupations with SVP scores less than 4 (or the job zone 1 jobs).[7] Career-oriented jobs are the occupations with SVP scores greater than or equal to 4 (or the occupations in job zone 2 or above). In sum, we consider three occupation states: not working, working in dead-end jobs, and working in career-oriented jobs.

We link the job zone variable to the March CPS for 1996-2002. Table 1A tabulates the distribution of occupation states for husbands and wives.[8] It supports one of our assumptions, which is that men

[5] This is reproduced from Oswald, Campbell, McCloy, Rivkin, and Lewis (1999).

[6] A job zone is a group of occupations that are similar in how most people get into the work, how much overall experience people need to do the work, how much education people need to do the work, and how much on-the-job training people need to do the work. The job zones range from 1 (occupations that need little or no preparation) to 5 (occupations that need extensive preparation).

[7] We analyze the Mincer earnings regression for each job zone separately for the period 1996-2002 and find that the returns to education and experience for job zone 1 are significantly different from those of job zone 2 as classified by the O*NET (results not shown). We find this difference in earnings growth between job zone 1 and 2 occupations is consistent over time. For example, over 20 years, there is an earnings gap of $42,000 between job zones 1 and 2 assuming 40 hours/week and 48 weeks in a year. Hence, we categorize all jobs with SVP<4 (or job zone 1) as dead-end jobs and job zone 2 and above as career-oriented jobs.

[8] There was a change in the standard occupational classification (SOC) system. The CPS used the 1980 SOC system for 1996-2002 and the 2000 SOC system for 2003-2008. Due to the change, the share of individuals in dead-end jobs declines

and women are primary and secondary workers, respectively. Over 90% of married men were employed irrespective of their wife's job zone. About 73.7% of native husbands and 60.4% of immigrant husbands had career-oriented occupations and about 17.1% of native husbands and 31.0% of immigrant husbands were in dead-end jobs. For married women, however, 23.9% of native wives and 38.6% of foreign-born wives do not work. Hence, we can assume that most husbands are working and analyze the occupational mobility of wives conditional on their husband's job zone.[9]

Table 1A. Occupation States

		Wife			
		Not Working	Dead-End	Career-Oriented	Total
		Native Sample (1996-2002)			
Husband	Not Working	4.1	1.4	3.7	9.2
	Dead-End	4.0	4.3	8.9	17.1
	Career-Oriented	16.0	9.7	48.0	73.7
	Total	24.0	15.4	60.6	100.0
		Immigrant Sample (1996-2002)			
Husband	Not Working	4.4	2.3	1.9	8.6
	Dead-End	12.6	12.2	6.2	31.0
	Career-Oriented	21.8	11.9	26.7	60.4
	Total	38.9	26.4	34.8	100.0

We find that the transition probabilities from dead-end jobs to not working status are sensitive to husband's earnings especially for immigrant women, which is consistent with the FIH. Table 1B examines the transition probabilities conditional on husband's earnings. husband's earnings are grouped into four quartiles. The table lists the occupation mobility of wives sorted by the first quartile (lowest earnings) to the fourth quartile (highest earnings). For native married women, we find that about 8.6-11.6% move from dead-end jobs in year 1 to not working status in year 2. For immigrant women, we find the percentage of women transitioning from dead-jobs in year 1 to not working status in year 2 increases with an increase in

considerably in the period 2003-2008. For example, 15.4% of native and 26.4% of immigrant women were employed in dead-end jobs during 1996-2002, but only 3.3% of native and 12.5% of immigrant women were employed in dead-end jobs during 2003-2008. This study focuses on the 1996-2002 period because the number of individuals in dead-end jobs is too small for 2003-2008 to do meaningful analysis.

[9] One may determine primary and secondary workers by year of entry. Secondary workers are more likely to enter the United States later than primary workers.

husband's earnings: from 9.1% for women married to husbands with earnings in the first quartile to 21.1% for those in the fourth quartile. We find that the transition probabilities are not sensitive to education or years since migration.

Table 1B. Wife's Occupation State in Year 2 conditional on that in Year 1 by Husband's Earnings Quartile

		Occupation State in Year 2							
		Not Working		Dead-End		Career-Oriented		Total	
		Native	Immig.	Native	Immig.	Native	Immig.	Native	Immig.
Husband's Earnings in 1st Quartile									
Occupation	Not Working	85.4	84.3	6.5	10.7	8.1	5.1	100.0	100.0
State	Dead-End	9.7	9.1	65.6	77.0	24.8	13.9	100.0	100.0
in Year 1	Career-Oriented	6.2	11.4	9.0	14.1	84.9	74.6	100.0	100.0
Husband's Earnings in 2nd Quartile									
Occupation	Not Working	77.4	82.0	9.4	8.2	13.2	9.8	100.0	100.0
State	Dead-End	8.6	14.4	66.1	66.4	25.4	19.2	100.0	100.0
in Year 1	Career-Oriented	5.2	8.9	7.0	12.0	87.8	79.1	100.0	100.0
Husband's Earnings in 3rd Quartile									
Occupation	Not Working	80.6	78.1	6.2	4.8	13.2	17.1	100.0	100.0
State	Dead-End	9.7	18.5	63.9	61.5	26.4	20.0	100.0	100.0
in Year 1	Career-Oriented	4.8	31.6	5.5	18.4	89.7	50.0	100.0	100.0
Husband's Earnings in 4th Quartile									
Occupation	Not Working	82.6	87.5	3.5	5.6	13.9	6.9	100.0	100.0
State	Dead-End	11.6	21.1	58.7	50.0	29.6	29.0	100.0	100.0
in Year 1	Career-Oriented	7.2	8.4	4.5	3.5	88.3	88.1	100.0	100.0

3.2 The CPS and Summary Statistics

The CPS is a monthly survey based on the civilian non-institutionalized population of the United States. The CPS sample provides basic information on the demographic status and the labor force situation of the population 16 years of age and older. The Annual Social and Economic Supplement of the CPS or the

March CPS additionally provides data on labor market outcomes and income in addition to the basic CPS sample. We exploit the longitudinal structure of the March CPS. Our sample is a collection of two-year panels with overlapping periods, e.g. 1996-1997, 1997-1998, … , 2001-2002. The balanced part of the panel is called the matched March CPS.[10]

We take a sample of foreign-born and native-born couples of ages 24-60 for 1996 to 2002.[11] In order to examine differences based on ethnic origin, we divide the foreign sample into 4 groups: immigrants from Central and South America, from Europe (including Australia, New Zealand, and Canada), from Asia, and from other countries.[12] The group of the other countries consists of immigrants from Africa, Oceania, and unclassified ones. The last group is of little interest due to its small sample size and heterogeneity. Details on how the data are processed are explained in the Appendix.

Table 2 provides summary statistics of own and spouse demographic and family control variables. Occupations are closely related to education. Women working in career-oriented jobs and their husbands have higher education than others. Immigrant women working in career-oriented jobs and their husbands have higher education than their native counterparts, but the other groups of immigrants have lower education that their native counterparts. Native-born and foreign-born women in career-oriented jobs have 1-2 and 3-4 additional years of education, respectively, than those who choose not to work or those in dead-end jobs. A similar pattern applies to men.

For both native and immigrant women, husband's earnings and family non-labor income are highly correlated with the decision to work. These two factors are highest for women who are not working followed by women in career-oriented jobs and dead-end jobs. Husband annual earnings for women not working are $57,100 and $41,900 for natives and immigrants, which are about $14,000-17,000 higher than those of women working in dead-end jobs. Family non-labor income for women not working are $11,340 and $5,420 for natives and immigrants, which is also much larger than those of women working in dead-end jobs.

[10] A drawback of using the matched March CPS is its large attrition rate. We address this problem by applying an attrition correcting method. The method assigns weights to the individuals in the balanced panel in such a way that the weighted panel becomes a representative sample in each period. For details, see Bhattacharya (2008) or Kim (2009a). To make our analysis robust, we make two separate approaches, one using and the other not using attrition correcting weights. We find that the two sets of empirical findings are similar. This paper reports results that do not use weights.

[11] The foreign sample includes foreign-born individuals who were not U.S. citizens at the time of birth. Following Warren and Peck (1980), our foreign sample consists of persons born outside the United States, the Commonwealth of Puerto Rico, and the outlying areas of the United States. Foreign-born persons may have acquired U.S. citizenship by naturalization or may be in illegal status. The reference group consists of native-born individuals. The native sample includes persons born in the Unites States, but excludes persons born in the Puerto Rico and the outlying areas.

[12] We combine Australia, New Zealand, and Canada with Europe because of sample size considerations and so that immigrants from countries that are predominantly white and are at a similar stage of political and economic development are grouped together. We refer to the group as Europe. The data do not identify mother tongue. The impact of language proficiency has been studied in a large literature. LaLonde and Topel (1997) provide a survey.

Table 2. Summary Statistics

	Wife's Occupation State (Matched sample)							
	Not Working		Dead-End		Career-Oriented		Total	
	Native	Immig.	Native	Immig.	Native	Immig.	Native	Immig.
Age	44.13	41.44	42.56	42.87	42.16	43.62	42.69	42.58
	(10.42)	(10.19)	(9.30)	(8.20)	(9.07)	(8.45)	(9.48)	(9.15)
Husband Age	46.25	44.66	44.74	45.80	44.29	46.56	44.83	45.63
	(10.38)	(10.21)	(9.60)	(8.67)	(9.45)	(8.54)	(9.74)	(9.28)
Years Since Migration (YSM)		12.68		13.51		15.67		13.94
		(9.03)		(7.66)		(8.70)		(8.66)
Husband YSM		15.11		15.10		16.94		15.74
		(9.49)		(8.10)		(8.93)		(8.98)
Education	13.16	10.60	12.65	10.33	14.35	14.33	13.81	11.83
	(2.34)	(4.73)	(1.79)	(4.26)	(2.22)	(3.68)	(2.30)	(4.64)
Husband Education	13.77	11.64	12.90	10.92	14.27	14.88	13.94	12.58
	(3.04)	(5.22)	(2.33)	(4.37)	(2.53)	(4.14)	(2.67)	(4.94)
Wife Earnings	2.11	1.35	15.94	14.81	30.61	34.20	21.60	16.38
($\times$1000 in 2004 dollars)	(9.77)	(13.59)	(13.98)	(11.23)	(29.49)	(38.76)	(26.95)	(28.74)
Husband Earnings	57.10	41.90	39.68	26.99	52.01	57.01	51.30	43.20
($\times$1000 in 2004 dollars)	(69.11)	(56.36)	(38.65)	(25.01)	(50.58)	(68.52)	(54.28)	(56.22)
Family Non-Labor Income	11.34	5.42	5.66	3.49	7.65	6.22	8.21	5.18
($\times$1000 in 2004 dollars)	(22.14)	(14.71)	(13.56)	(9.25)	(18.29)	(17.12)	(18.75)	(14.47)
# of Children below Age 6	0.42	0.52	0.23	0.24	0.27	0.25	0.30	0.35
	(0.76)	(0.75)	(0.54)	(0.54)	(0.58)	(0.54)	(0.63)	(0.65)
# of Children below Age 18	1.17	1.52	1.07	1.34	0.99	1.09	1.05	1.32
	(1.35)	(1.45)	(1.19)	(1.31)	(1.11)	(1.10)	(1.19)	(1.31)
Wife Continent of Origin								
Central and South American		0.49		0.55		0.27		0.43
European		0.12		0.12		0.19		0.15
Asian		0.35		0.28		0.49		0.38
Husband Continent of Origin								
Central and South American		0.48		0.55		0.26		0.42
Husband European		0.12		0.12		0.20		0.15
Husband Asian		0.35		0.27		0.49		0.38
N (sample size)	8255	807	5421	558	21246	730	34922	2095

Among immigrant women, 43% are from Central and South America, 15% are from Europe, and 38% are from Asia.[13] In terms of years since migration, women who are in career-oriented jobs have on average stayed longest in the United States followed those who are in dead-end jobs and those who are not working. For men there is no significant pattern. Among immigrant wives, Central and South American women are most likely to not work (49%) and to be in dead-end jobs (55%). Asian women are most likely to be in career-oriented jobs (49%).

4 A Dynamic Model of Occupation Choices

This section tests the third testable implication discussed in Section 2. It presents the empirical specification to analyze the differences in the occupational status between immigrant and native couples. The dependent variable is occupation state that a particular wife is in - 0 for not working status, 1 for dead-end jobs, and 2 for career-oriented jobs. We find that empirical results support the FIH.

4.1 Empirical Specification

Let S_{it} be the state of an individual i in calendar year t. We consider three states: not working ($S_{it} = 0$), working in a dead-end job ($S_{it} = 1$), and working in a career-oriented job ($S_{it} = 2$). We are interested in a first-order Markov-switching model that defines a transition probability from state s_{t-1} to state s_t by

$$p_{s_t|s_{t-1}} \equiv \Pr\left[S_{it} = s_t | S_{i,t-1} = s_{t-1}\right], \tag{1}$$

for $s_{t-1}, s_t \in \{0, 1, 2\}$. Suppose that the probability (1) is a function of a vector of covariates, X, and is given in a parametric form. Then (1) can be rewritten as

$$p_{s_t|s_{t-1}}\left(X_{i,t-1}; \theta_{s_{t-1}}\right) \equiv \Pr\left[S_{it} = s_t | S_{i,t-1} = s_{t-1}, X_{i,t-1}; \theta_{s_{t-1}}\right], \tag{2}$$

for $s_{t-1}, s_t \in \{0, 1, 2\}$. For any given state, $S_{i,t-1} = s_{t-1}$, let $\theta_{s_{t-1}}$ be the vector of parameters. One may estimate the probabilities by maximum likelihood (ML) estimation. Conditional on $S_{i,t-1} = s_{t-1}$, the ML estimator is given by the maximizer of

$$L\left(\theta_{s_{t-1}}\right) = \sum_{i=1}^{n} \sum_{j=0}^{2} 1\left\{S_{it} = j\right\} \log p_{j|s_{t-1}}\left(X_{i,t-1}; \theta_{s_{t-1}}\right).$$

[13] The numbers do not add to 100% since we exclude the other group of immigrant population.

For each $s_{t-1} = 0, 1, 2$, we apply a separate maximum likelihood estimation procedure and obtain the ML estimator, $\widehat{\theta}_{s_{t-1},ML}$. Then the estimated probabilities are

$$\widehat{p}_{s_t|s_{t-1}}\left(X_{i,t-1}\right) \equiv p_{0|s_{t-1}}\left(X_{i,t-1}; \widehat{\theta}_{s_{t-1},ML}\right), \qquad \text{for } s_{t-1}, s_t \in \{0, 1, 2\}. \tag{3}$$

We specify a multinomial logit model and apply the maximum likelihood estimation procedure to estimate (2). To fix ideas, partition the parameter vector $\theta_{s_{t-1}}$ by $\theta_{s_{t-1}} = \left(\beta'_{0|s_{t-1}}, \beta'_{1|s_{t-1}}, \beta'_{2|s_{t-1}}\right)'$. The conditional probability of $s_t|s_{t-1}$ is given by

$$p_{s_t|s_{t-1}}\left(x; \theta_{s_{t-1}}\right) = \frac{e^{x'\beta_{s_t|s_{t-1}}}}{e^{x'\beta_{0|s_{t-1}}} + e^{x'\beta_{1|s_{t-1}}} + e^{x'\beta_{2|s_{t-1}}}}, \qquad \text{for } s_t = 0, 1, 2. \tag{4}$$

A necessary identification condition is to set $\beta'_{s_t|s_{t-1}} = 0$ for $s_t = s_{t-1}$, which is the case where an individual does not change her occupation status between $t-1$ and t. We need this identification restriction because (3) sum up to one: $1 = \widehat{p}_{0|s_{t-1}}\left(X_{i,t-1}\right) + \widehat{p}_{1|s_{t-1}}\left(X_{i,t-1}\right) + \widehat{p}_{2|s_{t-1}}\left(X_{i,t-1}\right)$, for each $s_{t-1} = 0, 1, 2$.

The vector of covariates, $X_{i,t-1}$, includes a constant, age, age squared, education, the number of children below 6, the number of children below 18, labor income of husbands, non-labor family income, and occupational status of husbands.[14] All these variables are interacted with a dummy for immigrants since the impact of these control variables may be different across native and foreign-born women. In addition, years since migration, years since migration squared, country of birth, and entry year and calendar year dummies are added. The dummy variables of country of birth and entry year control for different skill composition across birth country and entry year cells.

We assume that husbands are primary workers and wives are secondary workers. It means that the wife's occupational status is affected by the labor market outcomes of her husband, but not the other way around. By making this assumption, we alleviate the possibility of endogeneity of the husband's income and family non-labor income variables in the model. This assumption is supported by the observation that more than 90% of males participate in the labor market, which is consistent across natives and immigrants.

[14] See Blundell and MaCurdy (1999) for a survey.

4.2 Empirical Findings

We estimate $\theta_{s_{t-1}} = \left(\beta'_{0|s_{t-1}}, \beta'_{1|s_{t-1}}, \beta'_{2|s_{t-1}}\right)'$ in (2).[15] Table A1 in the Appendix reports the multinomial logit model estimates, $\widehat{\theta}_{s_{t-1}}$. These estimates are not directly interpretable, but give the signs of the impact of corresponding covariates on the probabilities of moving to other occupation states. The first column 'From 0' shows estimates using women who did not work in the first year. The second and third columns 'From 1' and 'From 2' show estimates using the sub-sample of women in dead-end jobs and in career-oriented jobs, respectively, in the first year. For each of the regression results, those who stay in the same occupation are the reference group.

The FIH predicts that immigrant women in dead-end jobs are more responsive to increases in non-labor income than native women in dead-end jobs. In our empirical specification, the coefficient of spouse earnings (or family non-labor income) interacted with an immigrant dummy is expected to be positive significant for $S_{t-1} = 1$. In Table A1, we do find that the coefficient is positive significant and large for $S_{t-1} = 1$ and not statistically different from zero for $S_{t-1} = 2$. This implies that immigrants in dead-end jobs are more likely to quit working with an increase in their spousal labor income than natives in dead-end jobs and that immigrants in career-oriented jobs are not.

To understand the meanings of the coefficient estimates, we turn to the implied function estimates. We analyze the immigrant-native differences in transition probabilities from one state to another, which are given by $p^{imm}_{s_t|s_{t-1}}\left(x; \widehat{\theta}_{s_{t-1}}\right) - p^{nat}_{s_t|s_{t-1}}\left(x; \widehat{\theta}_{s_{t-1}}\right)$. Since the functions are non-linear and multi-dimensional, we evaluate the differences in transition probabilities at some selected points. More specifically, we consider hypothetical immigrant couples from Central and South America, Europe, and Asia entering the United States at age 24 (wife) and 27 (husband) in year 1990. We follow them for the next 18 years until they become 42 and 45 years old, respectively. We compute probabilities at 0, 6, 12, and 18 years since migration. We assume that they have their first child between ages (24,27) and (30,33) and have a second child between ages (30,33) and (36,39). In effect, in each time of evaluation, the distribution of children below 6 years and below 18 years of age is ((0,0), (1,0), (1,2), (0,2)).

We also assume husband's earnings and family non-labor income for this hypothetical couple to be the age-occupation specific income averages over the native population. For example, for couples of ages 24 (wife) and 27 (husband) and men working in career-oriented jobs, husband's earnings and family non-labor income are evaluated at $37,270 and $1,660, respectively. The evaluation values are ($48,670,$2,680),

[15] We estimate the same model using attrition-correcting weights and find qualitatively the same results. The results are not presented, but are available upon request.

($60,180,$3,990), and ($63,860,$5,480) as these couples become (30,33), (36,39), and (42,45) ages old. Both wife and husband are assumed to have 12 years of education. The husband's occupation state enters as a control variable since we assume the wife to be the secondary worker and the husband to be the primary worker.

Table 3A reports the transition probability estimates from state 1 (dead-end jobs) to each of the three occupation states evaluated at the above control variables. For immigrant couples, we let both the wife and the husband be from the same continent. Table 3B presents the foreign-native difference in the reported probabilities in Table 3A. The probabilities of transitioning from state 0 (not working) and from state 2 (career-oriented jobs) are presented in the Appendix. Overall, we do not find much immigrant-native difference in the transition probabilities of those who do not work or work in career-oriented jobs in year 1.

From Table 3A, the estimates in the first three columns (Native) and the first row (Husband in 0) are 0.20, 0.55, and 0.25. The estimates are all significant at the 1% level. These estimates imply that for native women (24 years old, high school graduates, and not working) married to native men (27 years old, high school graduates, not working with national average earnings conditional on age and occupation), 20% are likely to not work, 55% are likely to work in dead-end jobs, and 25% are likely to work in career-oriented jobs in the following year.

The corresponding estimates for Central and South Americans are 0.01, 0.59, and 0.40. They are not very significant, but the point estimates suggest that for Central and South American women (24 years old, 0 years since migration, high school graduates, and not working) married to Central and South American men (27 years old, 0 years since migration, high school graduates, not working with national average earnings conditional on age and occupation), 1% are likely to not work, 59% are likely to work in dead-end jobs, and 40% are likely to work in career-oriented jobs in the following year.

The second row calculates the transition probabilities for women (30 years old, 6 years since migration if immigrant, high school graduates, and not working) and men (33 years old, 6 years since migration if immigrant, high school graduates, not working with national average earnings conditional on age). These transition probabilities are shown graphically in Figures 1a, 1b, and 1c. Figure 1a suggests that, with age or years since migration, immigrant women working in dead-end jobs are more likely to drop out of the labor force than native women. According to Figure 1b, immigrant women working in dead-end jobs are less likely to stay in dead-end jobs than their native counterparts. To see whether the immigrant-native gaps are statistically significant, we turn to Table 3B.

Table 3B reports the immigrant-native difference in the transition probabilities with standard errors. Overall we find, conditional on being in a dead-end job in year 1, with an increase in years since migration, immigrant women decrease their participation in the labor force relative to native women and this difference is statistically significant. The probability of being in dead-end jobs also decreases significantly with an increase in years since migration; this is evidence in favor of the FIH. This result is most prominent for foreign-born women whose husbands have career-oriented jobs since these men have most likely assimilated in the U.S. labor market.

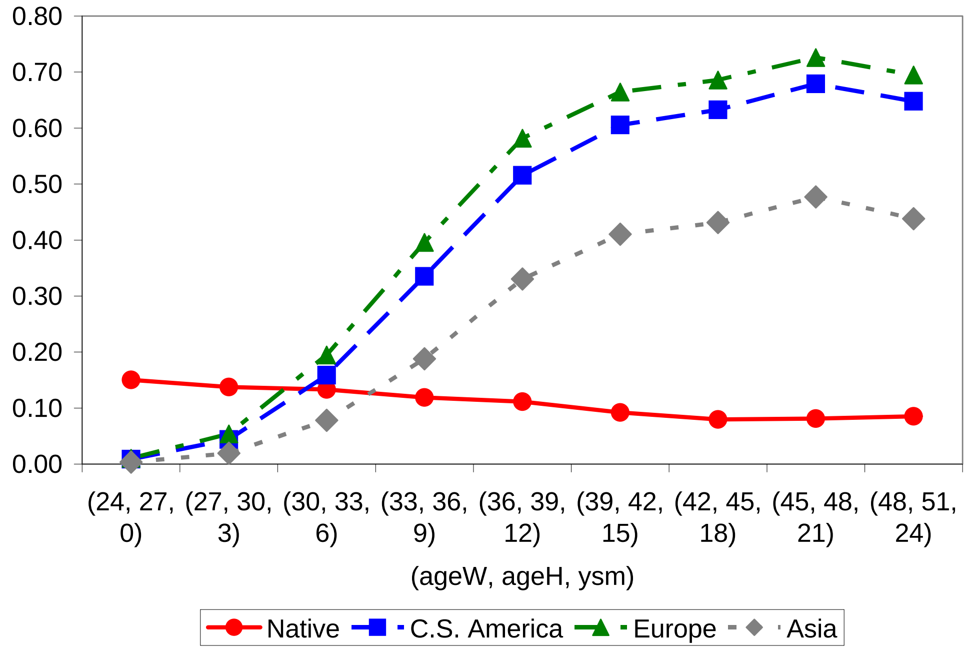

Figure 1a. Transition Probabilities from 1 to 0 by Continent of Origin

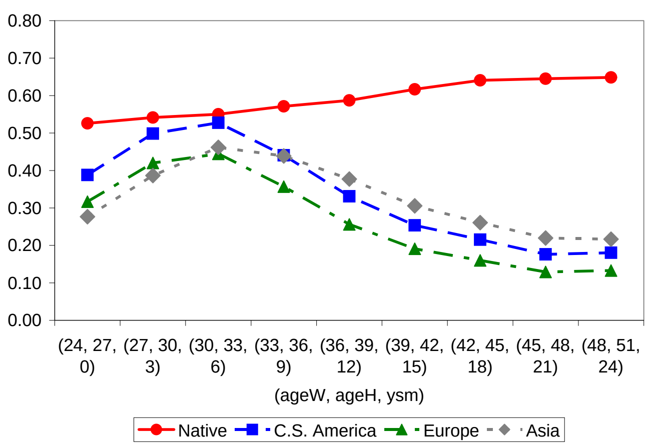

Figure 1b. Transition Probabilities from 1 to 1

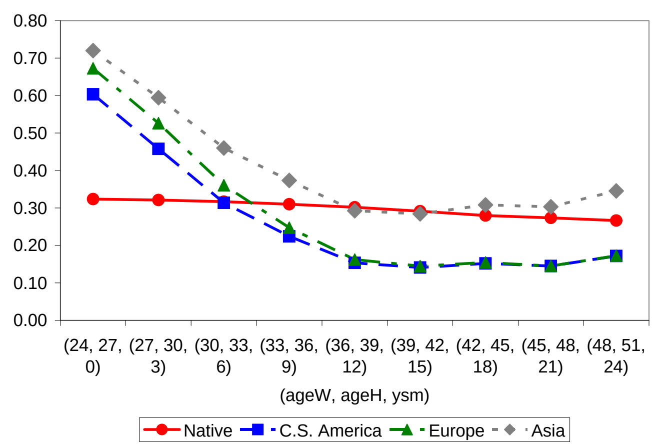

Figure 1c. Transition Probabilities from 1 to 2

Table 3A. Evaluation Results: $p^{nat}_{s_t|s_{t-1}=dead-end}\left(x;\theta_{s_{t-1}}\right)$ and $p^{imm}_{s_t|s_{t-1}=dead-end}\left(x;\theta_{s_{t-1}}\right)$ evaluated at (age^w,age^h,ysm)

	Transition Probabilities from $S_{t-1}=1$ (Dead-End Jobs) to S_t											
	Native			C.S. America			Europe			Asia		
S_t :	0	1	2	0	1	2	0	1	2	0	1	2
Husband in 0												
$(24,27,0)$	0.20^{***}	0.55^{***}	0.25^{***}	0.01	0.59^{*}	0.40	0.02	0.51	0.47	0.01	0.47	0.53
	(0.04)	(0.05)	(0.04)	(0.02)	(0.32)	(0.33)	(0.03)	(0.34)	(0.34)	(0.01)	(0.33)	(0.34)
$(30,33,6)$	0.17^{***}	0.59^{***}	0.24^{***}	0.15	0.69^{***}	0.16^{*}	0.20	0.61^{***}	0.19^{*}	0.08	0.67^{***}	0.25^{*}
	(0.03)	(0.03)	(0.03)	(0.11)	(0.13)	(0.09)	(0.13)	(0.15)	(0.12)	(0.07)	(0.14)	(0.14)
$(36,39,12)$	0.13^{***}	0.63^{***}	0.24^{***}	0.39^{*}	0.53^{***}	0.08	0.47^{**}	0.44^{**}	0.09	0.25	0.60^{***}	0.16
	(0.02)	(0.03)	(0.03)	(0.21)	(0.19)	(0.07)	(0.23)	(0.20)	(0.08)	(0.18)	(0.18)	(0.11)
$(42,45,18)$	0.09^{***}	0.69^{***}	0.22^{***}	0.50^{*}	0.41	0.09	0.58^{**}	0.32	0.10	0.33	0.48^{**}	0.18
	(0.02)	(0.03)	(0.03)	(0.30)	(0.26)	(0.10)	(0.31)	(0.25)	(0.12)	(0.28)	(0.25)	(0.17)
Husband in 1												
$(24,27,0)$	0.16^{***}	0.57^{***}	0.27^{***}	0.01	0.50	0.49	0.01	0.42	0.56^{*}	0.00	0.38	0.62^{**}
	(0.03)	(0.04)	(0.03)	(0.02)	(0.32)	(0.32)	(0.02)	(0.32)	(0.32)	(0.01)	(0.30)	(0.30)
$(30,33,6)$	0.14^{***}	0.60^{***}	0.26^{***}	0.14	0.63^{***}	0.22^{**}	0.18	0.55^{***}	0.27^{**}	0.07	0.58^{***}	0.34^{***}
	(0.02)	(0.03)	(0.02)	(0.09)	(0.11)	(0.10)	(0.12)	(0.14)	(0.13)	(0.05)	(0.13)	(0.13)
$(36,39,12)$	0.11^{***}	0.64^{***}	0.25^{***}	0.43^{**}	0.45^{***}	0.11	0.51^{**}	0.37^{**}	0.12	0.28^{*}	0.51^{***}	0.21^{*}
	(0.01)	(0.02)	(0.02)	(0.19)	(0.16)	(0.07)	(0.21)	(0.17)	(0.09)	(0.17)	(0.16)	(0.12)
$(42,45,18)$	0.08^{***}	0.70^{***}	0.23^{***}	0.54^{**}	0.34	0.12	0.61^{**}	0.26	0.13	0.36	0.40^{*}	0.24
	(0.01)	(0.02)	(0.02)	(0.28)	(0.22)	(0.12)	(0.29)	(0.21)	(0.14)	(0.27)	(0.22)	(0.19)
Husband in 2												
$(24,27,0)$	0.15^{***}	0.53^{***}	0.32^{***}	0.01	0.39	0.60^{**}	0.01	0.32	0.67^{**}	0.00	0.28	0.72^{***}
	(0.03)	(0.04)	(0.04)	(0.01)	(0.31)	(0.31)	(0.02)	(0.28)	(0.29)	(0.01)	(0.26)	(0.26)
$(30,33,6)$	0.13^{***}	0.55^{***}	0.32^{***}	0.16	0.53^{***}	0.31^{**}	0.19	0.44^{***}	0.36^{**}	0.08	0.46^{***}	0.46^{***}
	(0.02)	(0.02)	(0.02)	(0.10)	(0.13)	(0.13)	(0.13)	(0.14)	(0.15)	(0.06)	(0.14)	(0.15)
$(36,39,12)$	0.11^{***}	0.59^{***}	0.30^{***}	0.52^{***}	0.33^{**}	0.15	0.58^{***}	0.26^{*}	0.16	0.33^{*}	0.38^{***}	0.29^{*}
	(0.01)	(0.02)	(0.02)	(0.20)	(0.15)	(0.10)	(0.21)	(0.14)	(0.12)	(0.19)	(0.15)	(0.16)
$(42,45,18)$	0.08^{***}	0.64^{***}	0.28^{***}	0.63^{**}	0.22	0.15	0.69^{***}	0.16	0.15	0.43	0.26	0.31
	(0.01)	(0.02)	(0.02)	(0.27)	(0.17)	(0.15)	(0.27)	(0.14)	(0.17)	(0.31)	(0.17)	(0.25)

Table 3B. $p^{imm}_{s_t|s_{t-1}=dead-end}\left(x;\theta_{s_{t-1}}\right) - p^{nat}_{s_t|s_{t-1}=dead-end}\left(x;\theta_{s_{t-1}}\right)$ evaluated at (age^w,age^h,ysm)

	Difference in Transition Probabilities from $S_{t-1}=1$ (Dead-End Jobs) to S_t								
	C.S. America			Europe			Asia		
S_t :	0	1	2	0	1	2	0	1	2
Husband in 0									
$(24, 27, 0)$	-0.18***	0.04	0.15	-0.18***	-0.04	0.22	-0.19***	-0.09	0.28
	(0.05)	(0.32)	(0.33)	(0.05)	(0.34)	(0.34)	(0.04)	(0.33)	(0.34)
$(30, 33, 6)$	-0.02	0.10	-0.09	0.03	0.03	-0.06	-0.09	0.08	0.01
	(0.11)	(0.13)	(0.10)	(0.13)	(0.15)	(0.12)	(0.07)	(0.14)	(0.14)
$(36, 39, 12)$	0.25	-0.10	-0.15**	0.33	-0.19	-0.14*	0.11	-0.03	-0.08
	(0.21)	(0.20)	(0.07)	(0.23)	(0.21)	(0.08)	(0.18)	(0.18)	(0.12)
$(42, 45, 18)$	0.41	-0.28	-0.13	0.48	-0.37	-0.12	0.24	-0.21	-0.03
	(0.30)	(0.26)	(0.10)	(0.31)	(0.25)	(0.12)	(0.29)	(0.25)	(0.18)
Husband in 1									
$(24, 27, 0)$	-0.15***	-0.07	0.22	-0.15***	-0.15	0.29	-0.15***	-0.19	0.35
	(0.03)	(0.32)	(0.32)	(0.04)	(0.32)	(0.32)	(0.03)	(0.30)	(0.30)
$(30, 33, 6)$	0.01	0.03	-0.04	0.05	-0.05	0.00	-0.06	-0.02	0.08
	(0.09)	(0.11)	(0.10)	(0.12)	(0.14)	(0.13)	(0.05)	(0.13)	(0.13)
$(36, 39, 12)$	0.32*	-0.19	-0.14*	0.40**	-0.27	-0.1252758	0.17	-0.13	-0.04
	(0.19)	(0.16)	(0.08)	(0.21)	(0.17)	(0.09)	(0.17)	(0.16)	(0.12)
$(42, 45, 18)$	0.46*	-0.35	-0.11	0.53*	-0.43**	-0.10	0.28	-0.29	0.01
	(0.28)	(0.22)	(0.12)	(0.29)	(0.21)	(0.14)	(0.28)	(0.22)	(0.19)
Husband in 2									
$(24, 27, 0)$	-0.14***	-0.14	0.28	-0.14***	-0.21	0.35	-0.15***	-0.25	0.40
	(0.03)	(0.31)	(0.31)	(0.03)	(0.28)	(0.29)	(0.03)	(0.26)	(0.26)
$(30, 33, 6)$	0.03	-0.02	0.00	0.06	-0.11	0.04	-0.05	-0.09	0.14
	(0.10)	(0.13)	(0.13)	(0.12)	(0.14)	(0.15)	(0.06)	(0.14)	(0.15)
$(36, 39, 12)$	0.40**	-0.26*	-0.15	0.47**	-0.33**	-0.14	0.22	-0.21	-0.01
	(0.20)	(0.15)	(0.10)	(0.21)	(0.14)	(0.12)	(0.19)	(0.15)	(0.16)
$(42, 45, 18)$	0.55**	-0.43**	-0.13	0.61**	-0.48***	-0.13	0.35	-0.38**	0.03
	(0.27)	(0.17)	(0.16)	(0.27)	(0.15)	(0.17)	(0.31)	(0.18)	(0.25)

When we go back to the coefficient estimates in Table A1, column 'dead-end jobs', we see that this finding is due to the differential impact of husband's earnings on foreign-women relative to native women. For a dollar increase in husband's earnings, foreign-born women are more likely to switch from dead-end jobs to not working status relative to native women. Since earnings are most likely highest for husbands in career-oriented jobs, we find support for the FIH among foreign-born women whose husbands are in career-oriented jobs.

A robustness check for the test is to look at mixed couples, such as immigrant women married to native men or native women married to immigrant men. We predict that immigrant women married to native men will behave like native women in native couples because their families are expected to be less credit-constrained than immigrant couples. Similarly, native women married to immigrant men will behave different from native women in native couples because their families are expected to be more credit-constrained than native couples.

Tables 4A-4B are analogous to Table 3B, but list the differences in transition probabilities between women in mixed couples. Table 4A presents the foreign-native difference in transition probabilities for foreign-born women married to native-born men conditional on these women having dead-end jobs in year 1. We do not find a significant difference in occupation mobility from 1 to 0 between foreign-born women married to native-born men and native-born women married to native-born men. These foreign-born women also decrease their participation in dead-end jobs with increased stay in the United States but they transition to career-oriented jobs instead of not working status. In Table 4B, we find that the transition probabilities for native women married to immigrant men are significantly different from those for native women married to native men, although the signs are different from our prediction.

This robustness check is useful because in BB (1997), mixed couples are used to disentangle immigrant specific unobserved characteristics from the FIH. Drawbacks of this analysis include the fact that selection into marriage is not random. Immigrants or natives in mixed couples may be different from average immigrants and natives. In addition, there is potential for bias since the sample sizes of mixed families are quite small. Nonetheless, our findings are consistent with the FIH.

Table 4A. $p^{w=imm,h=nat}_{s_t|s_{t-1}=dead-end}\left(x;\theta_{s_{t-1}}\right) - p^{nat}_{s_t|s_{t-1}=dead-end}\left(x;\theta_{s_{t-1}}\right)$ evaluated at (age^w,age^h,ysm)

	Difference in Transition Probabilities from $S_{t-1}=1$ (Dead-End Jobs) to S_t								
	C.S. America			Europe			Asia		
S_t :	0	1	2	0	1	2	0	1	2
Husband in 0									
$(24, 27, 0)$	0.44	-0.23	-0.20**	0.03	0.11	-0.14	0.41	-0.23	-0.18
	(0.51)	(0.45)	(0.10)	(0.38)	(0.38)	(0.18)	(0.51)	(0.43)	(0.14)
$(30, 33, 6)$	0.25	-0.09	-0.16**	-0.06	0.16	-0.10	0.22	-0.10	-0.12
	(0.23)	(0.21)	(0.07)	(0.11)	(0.14)	(0.10)	(0.19)	(0.17)	(0.08)
$(36, 39, 12)$	0.10	-0.12	0.02	-0.09	-0.03	0.12	0.06	-0.18	0.12
	(0.18)	(0.19)	(0.17)	(0.06)	(0.21)	(0.21)	(0.15)	(0.17)	(0.18)
$(42, 45, 18)$	-0.02	-0.49**	0.51*	-0.08***	-0.50**	0.58**	-0.04	-0.54***	0.58***
	(0.15)	(0.23)	(0.31)	(0.03)	(0.24)	(0.25)	(0.11)	(0.18)	(0.24)
Husband in 1									
$(24, 27, 0)$	0.44	-0.22	-0.22**	0.04	0.12	-0.16	0.41	-0.21	-0.20
	(0.53)	(0.48)	(0.11)	(0.35)	(0.36)	(0.18)	(0.52)	(0.45)	(0.15)
$(30, 33, 6)$	0.24	-0.07	-0.17**	-0.04	0.16	-0.12	0.21	-0.08	-0.13
	(0.22)	(0.20)	(0.08)	(0.09)	(0.13)	(0.10)	(0.18)	(0.16)	(0.09)
$(36, 39, 12)$	0.11	-0.11	0.00	-0.07	-0.03	0.09	0.07	-0.17	0.09
	(0.17)	(0.19)	(0.17)	(0.05)	(0.20)	(0.21)	(0.14)	(0.17)	(0.18)
$(42, 45, 18)$	0.00	-0.49**	0.49	-0.06**	-0.50**	0.56**	-0.02	-0.54***	0.56**
	(0.14)	(0.24)	(0.31)	(0.03)	(0.25)	(0.27)	(0.10)	(0.19)	(0.24)
Husband in 2									
$(24, 27, 0)$	0.44	-0.18	-0.26**	0.05	0.14	-0.18	0.41	-0.18	-0.23
	(0.53)	(0.46)	(0.13)	(0.35)	(0.36)	(0.22)	(0.52)	(0.43)	(0.18)
$(30, 33, 6)$	0.25	-0.04	-0.21**	-0.04	0.17	-0.13	0.21	-0.06	-0.15
	(0.22)	(0.20)	(0.09)	(0.09)	(0.14)	(0.12)	(0.18)	(0.16)	(0.10)
$(36, 39, 12)$	0.10	-0.11	0.01	-0.07	-0.04	0.11	0.06	-0.17	0.10
	(0.17)	(0.19)	(0.19)	(0.05)	(0.22)	(0.22)	(0.13)	(0.16)	(0.19)
$(42, 45, 18)$	-0.01	-0.47**	0.49*	-0.07***	-0.49**	0.55***	-0.03	-0.52***	0.56***
	(0.13)	(0.20)	(0.27)	(0.03)	(0.21)	(0.22)	(0.09)	(0.15)	(0.20)

Table 4B. $p^{w=nat,h=imm}_{s_t|s_{t-1}=dead-end}\left(x;\theta_{s_{t-1}}\right) - p^{nat}_{s_t|s_{t-1}=dead-end}\left(x;\theta_{s_{t-1}}\right)$ evaluated at (age^w,age^h,ysm)

	Difference in Transition Probabilities from $S_{t-1}=1$ (Dead-End Jobs) to S_t								
	C.S. America			Europe			Asia		
S_t :	0	1	2	0	1	2	0	1	2
Husband in 0									
$(24,27,0)$	-0.19***	0.08	0.12	-0.20***	-0.24	0.43	-0.20***	0.14	0.06
	(0.04)	(0.44)	(0.44)	(0.04)	(0.42)	(0.42)	(0.04)	(0.46)	(0.46)
$(30,33,6)$	-0.11*	0.23*	-0.12	-0.14***	0.03	0.10	-0.17***	0.31**	-0.14
	(0.06)	(0.12)	(0.11)	(0.05)	(0.23)	(0.23)	(0.03)	(0.13)	(0.13)
$(36,39,12)$	0.10	0.11	-0.21***	0.04	0.11	-0.15	-0.13***	0.35***	-0.21***
	(0.24)	(0.24)	(0.04)	(0.22)	(0.22)	(0.10)	(0.02)	(0.05)	(0.04)
$(42,45,18)$	0.19	0.03	-0.21***	0.12	0.08	-0.20***	-0.09***	0.31***	-0.21***
	(0.44)	(0.44)	(0.03)	(0.39)	(0.39)	(0.04)	(0.02)	(0.03)	(0.03)
Husband in 1									
$(24,27,0)$	-0.16***	-0.05	0.20	-0.16***	-0.35	0.50	-0.16***	0.02	0.14
	(0.03)	(0.47)	(0.47)	(0.03)	(0.34)	(0.34)	(0.03)	(0.52)	(0.52)
$(30,33,6)$	-0.09*	0.16	-0.08	-0.11***	-0.09	0.21	-0.14***	0.24	-0.10
	(0.05)	(0.14)	(0.14)	(0.04)	(0.22)	(0.23)	(0.02)	(0.18)	(0.18)
$(36,39,12)$	0.15	0.06	-0.21***	0.07	0.04	-0.11	-0.11***	0.32***	-0.21***
	(0.24)	(0.23)	(0.05)	(0.22)	(0.23)	(0.13)	(0.01)	(0.06)	(0.06)
$(42,45,18)$	0.23	-0.01	-0.22***	0.16	0.04	-0.20***	-0.08***	0.30***	-0.22***
	(0.45)	(0.45)	(0.02)	(0.40)	(0.40)	(0.05)	(0.01)	(0.02)	(0.02)
Husband in 2									
$(24,27,0)$	-0.15***	-0.11	0.26	-0.15***	-0.37	0.52**	-0.15***	-0.05	0.20
	(0.03)	(0.46)	(0.46)	(0.03)	(0.26)	(0.26)	(0.03)	(0.54)	(0.54)
$(30,33,6)$	-0.07	0.11	-0.04	-0.11***	-0.17	0.28	-0.13***	0.21	-0.07
	(0.06)	(0.18)	(0.18)	(0.04)	(0.22)	(0.22)	(0.02)	(0.25)	(0.25)
$(36,39,12)$	0.25	0.00	-0.24***	0.13	-0.03	-0.10	-0.11***	0.34***	-0.23**
	(0.29)	(0.27)	(0.07)	(0.27)	(0.26)	(0.19)	(0.01)	(0.10)	(0.10)
$(42,45,18)$	0.37	-0.10	-0.27***	0.28	-0.04	-0.24***	-0.08***	0.35***	-0.27***
	(0.53)	(0.53)	(0.03)	(0.52)	(0.50)	(0.07)	(0.01)	(0.03)	(0.03)

5 Evidence from a Model of Hours Worked

This section tests the first and second implications from Section 2. We replicate BB (1997) and BKMS (2003) using our sample. They estimate a common model given by

$$H_{it} = x_{it}'\beta + \gamma_{Wc} + \gamma_{Hc} + a_1 ysm_{it}^W + a_2 \left(ysm_{it}^W\right)^2 + b_1 ysm_{it}^H + b_2 \left(ysm_{it}^H\right)^2 + k_t + u_{it},$$

where for individual i in year t, H_{it} is annual hours worked in the previous year, γ_{Wc} and γ_{Hc} are fixed effects for immigrants who entered in period c for wives and husbands, ysm_{it}^W and ysm_{it}^H are years since migration for wives and husbands, k_t is a common year effect, and x_{it} is a vector of control variables. Table 5 reports estimation results. IM7579 and IM7680 are the coefficients for dummies for immigrants who entered in years 1975-1979 and 1976-1980, respectively.

Table 5. Assimilation Profiles of Hours for Married Women

	(1)	(2)	(3)	(4)
Selected Covariates	BB (1997)	BKMS (2003)	CPS Full Sample	CPS Dead End
YSM, wife	28.779	25.207	51.820	41.582
	(10.780)	(2.170)	(23.116)	(58.259)
YSM^2, wife	–0.244	–0.416	–0.440	–0.879
	(0.159)	(0.036)	(0.577)	(1.399)
YSM, husband	–38.874	–2.054	–21.176	–76.895
	(10.982)	(2.233)	(24.752)	(61.714)
YSM^2, husband	0.334	–0.043	0.103	1.807
	(0.158)	(0.036)	(0.594)	(1.498)
...				
IM7579 or IM7680, wife	–338.155	–264.592	76.703	96.586
	(98.301)	(19.893)	(180.697)	(491.092)
IM7579 or IM7680, husband	560.985	51.897	168.710	363.556
	(99.900)	(20.730)	(190.821)	(521.092)
...				
N	34,445	650,266	75,968	6,166

The results from BB and BKMS are reported in the first and second columns of Table 5, respectively. The third column reports the same model estimates using the matched March CPS for 1996-2002.[16] In the fourth column, we restrict our sample to women who work in dead-end jobs in the first year of the panel and replace H_{it} with $H_{i,t+1}$ to make it consistent with the dynamic labor supply model. Using the estimates in Table 5, one can obtain hours profiles for immigrant women relative to native women. The four columns are depicted in four lines in Figure 2.

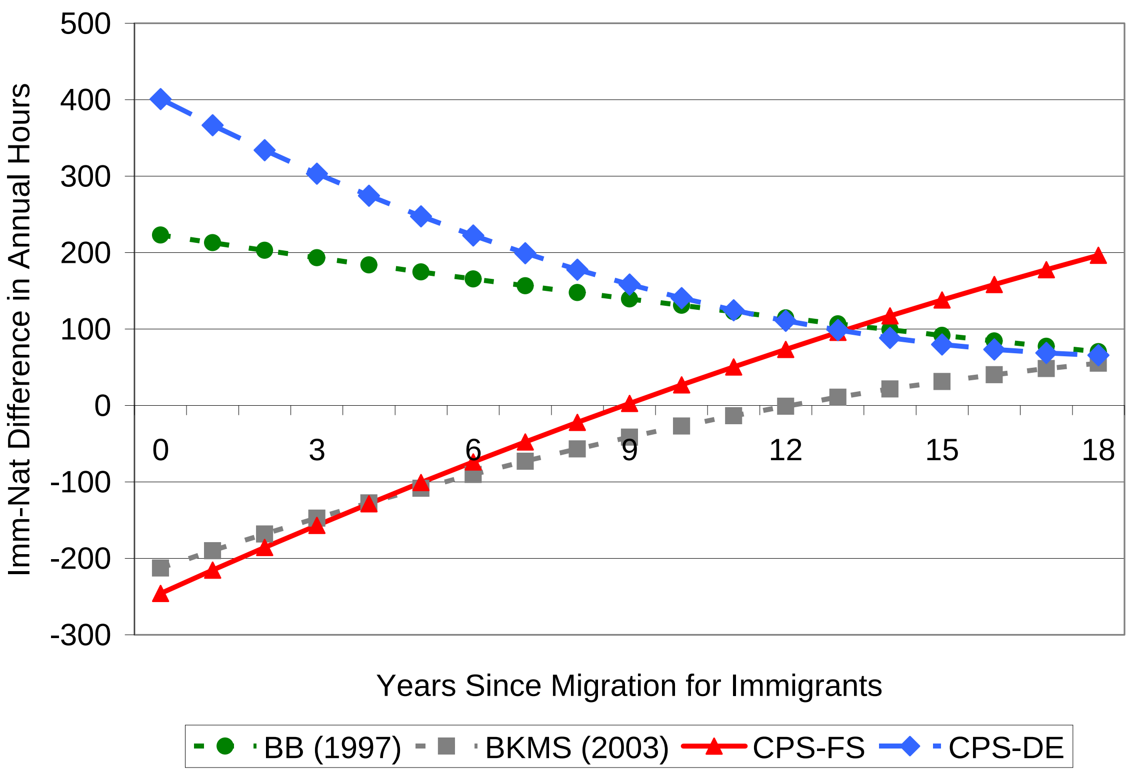

Figure 2. Hours Profiles for Immigrant Women relative to Native Women

First of all, Figure 2 shows the contrasting hours assimilation profiles obtained by BB and BKMS. The former find immigrant women reduce their work hours with continued stay in Canada, while the latter find the opposite for the U.S. case. The two hours assimilation profiles corresponding to BB and BKMS are reproduced from Figure 1 of BKMS. We add two more profiles obtained using our sample. Our full sample (CPS-FS) results produce a profile that is similar to the one obtained by BKMS. This is due to similar estimates of own and spouse years since migration obtained by the Census and the CPS

[16] Instead of English skill indicator, we use continent of origin since this information is not provided in the CPS data. We do not include race indicators, but add continent of origin indicators with immigrants from Central and South America being the omitted category. These are innocuous since dummy variables do not affect the slope estimates.

in columns 2 and 3 of Table 5. They are common in that the negative impact of husband's years since migration is not strong enough to offset the positive impact of wife's years since migration.

A striking finding is that once our sample is restricted to women who work in dead-end jobs (CPS-DE), we find that the negative impact of the husband's years since migration dominates the positive impact of wife's years since migration on work hours, which is similar to BB (see columns 1 and 4). The hours assimilation profile of wives who work in dead-end jobs, as shown in Figure 2, indicate that these women work more than natives on arrival, but decrease their work hours over the years.

This is consistent with the first two testable implications we discussed in Section 2. It is also consistent with the evidence we find for occupational mobility of immigrant women relative to their native counterparts: immigrant women working in dead-end jobs are more likely to transition to not working status relative to natives and immigrant women working in career-oriented jobs do not have this tendency. A caveat is that our replication results for the restricted sample of women in dead-end jobs suffer from small sample size and are not statistically significant. Nevertheless, our replication results suggest that the results of BKMS may change when the sample is confined to women in low-skilled jobs.

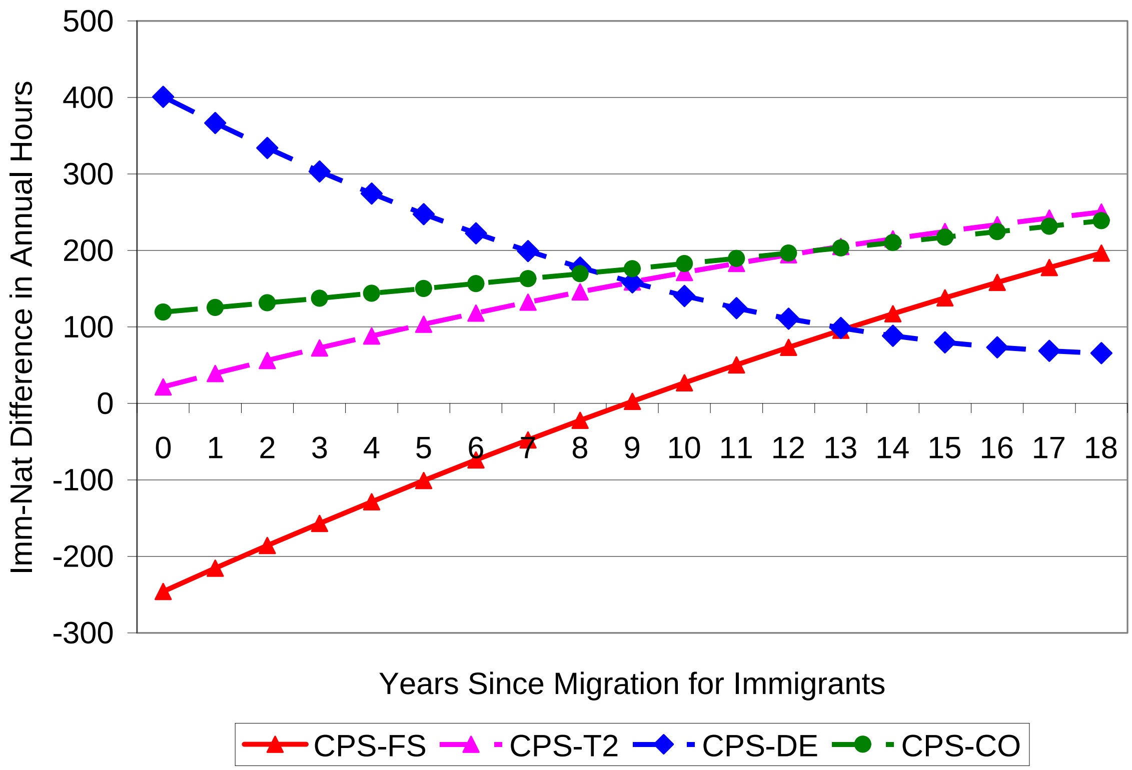

Figure 3. Hours Profiles for Immigrant Women relative to Native Women (CPS)

The results in column 4 cannot be reproduced by using the Census sample because a panel sample is necessary for our analysis. A possible concern is whether our results are driven by the fact that H_{it} is replaced with $H_{i,t+1}$. To verify that it is not the case, Figure 3 presents the $H_{i,t+1}$ results. CPS-T2 uses the same specification and data as CPS-FS except for using $H_{i,t+1}$ rather than H_{it}. Similar to BKMS or CPS-FS, the CPS-T2 line is an increasing function of years since migration. We find the same tendency when the sample is confined to women who work in career-oriented jobs (CPS-CO). Only CPS-DE is downward sloping, which is consistent with the theory.

6 Concluding Remarks

This paper develops a novel test for the FIH. We formally specify a two-period labor supply model of heterogeneous married women. This model provides three testable implications for the work hours and occupation choices for married women. To test the implication for occupation choices, we employ a first-order Markov switching model and analyze the dynamic feature of occupation choices. We find that immigrant women working in dead-end jobs are more likely to drop out of the labor force than their native counterparts, which is consistent with the prediction. We find that husband's earnings play a key role in this dynamics. Evidence from mixed couples provides further support of the FIH.

To test the implications for work hours, we replicate the existing model used in previous papers using our sample. We first show that the U.S. census and the CPS share similar patterns. That is the CPS results are very similar to BKMS when the entire sample is used. Then we show that the conventional results get reversed when the CPS sample is confined to women working in dead-end jobs. This is consistent with the prediction that women in credit-constrained households work longer hours upon arrival and decrease labor supply with time spent in the United States. Our results suggest that the increasing annual hours worked with years since migration found in previous U.S. studies used to reject the FIH are driven by the labor supply of women working in career-oriented jobs.

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8 Appendix

8.1 Variables Used in the Analyses

We collect data for 146,520 married foreign-born and native-born individuals (or 73,260 couples) of ages 24-65 from the matched March CPS sample for 1996-2002. The sample consists of married couples with their spouses present in the same addresses over the two year panel sample period. The sample excludes immigrants who came to the United States before the age of 18 and who entered the U.S. before 1950. Arrival years are given by intervals, so they are defined to be the mid-points of each period.

We drop 853 couples because we require both spouses to be not in the armed forces during the entire sampling period. Another 2,313 couples are dropped because the job zone variable does not include some of their occupation codes. We end up with 70,094 couples (63,857 native-native couples, 4,298 immigrant-immigrant couples, 1,126 immigrant women married to native men couples, and 813 native women married to immigrant men couples).

8.2 Job Zone Definitions as Presented in O*NET Tools

The five Job Zones are:

Job Zone 1 – occupations that need little or no preparation (SVP $<$ 4)

Job Zone 2 – occupations that need some preparation (4 $\leq$ SVP $<$6)

Job Zone 3 – occupations that need medium preparation (6 $\leq$ SVP $<$7)

Job Zone 4 – occupations that need considerable preparation (7 $\leq$ SVP $<$8)

Job Zone 5 – occupations that need extensive preparation (8 $\leq$ SVP)

Job Zone 1: Little or No Preparation Needed

No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a general office clerk even if he/she has never worked in an office before. These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license. Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show a new worker how to do the job. These occupations involve following instructions and helping others. Examples include bus drivers, forest and conservation workers, general office clerks, home health aides, and waiters/waitresses.

Job Zone 2: Some Preparation Needed

Some previous work-related skill, knowledge, or experience may be helpful in these occupations, but usually is not needed. For example, a drywall installer might benefit from experience installing drywall, but an inexperienced person could still learn to be an installer with little difficulty. These occupations usually require a high school diploma and may require some vocational training or job-related course work. In some cases, an associate's or bachelor's degree could be needed. Employees in these occupations need anywhere from a few months to one year of working with experienced employees. These occupations often involve using knowledge and skills to help others. Examples include drywall installers, fire inspectors, flight attendants, pharmacy technicians, retail salespersons, and tellers.

Job Zone 3: Medium Preparation Needed

Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training and often have passed a licensing exam in order to perform the job. Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree. Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers. These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include dental assistants, electricians, fish and game wardens, legal secretaries, personnel recruiters, and recreation workers.

Job Zone 4: Considerable Preparation Needed

A minimum of two to four years of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified. Most of these occupations require a four-year bachelor's degree, but some do not. Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training. Many of these occupations involve coordinating, supervising, managing, or training others. Examples include accountants, chefs and head cooks, computer programmers, historians, and police detectives.

Job Zone 5: Extensive Preparation Needed

Extensive skill, knowledge, and experience are needed for these occupations. Many require more than five years of experience. For example, surgeons must complete four years of college and an additional five to seven years of specialized medical training to be able to do their jobs. A bachelor's degree is the minimum formal education required for these occupations. However, many also require graduate school. For example, they may require a master's degree, and some require a Ph.D., M.D., or J.D. (law degree). Employees may need some on-the-job training, but most of these occupations assume that the person will already have the required skills, knowledge, work-related experience, and/or training. These occupations often involve coordinating, training, supervising, or managing the activities of others to accomplish goals. Very advanced communication and organizational skills are required. Examples include lawyers, instrumental musicians, physicists, counseling psychologists, and surgeons.

Table A1-1. Multinomial Coefficient Estimates

	Wife's Occupation State in Year 1 (1996-2002)					
Dependent Variable:	From $S_{t-1}=0$		From $S_{t-1}=1$		From $S_{t-1}=2$	
Wife's Occupation State in Year 2	To $S_t=1$	To $S_t=2$	To $S_t=0$	To $S_t=2$	To $S_t=0$	To $S_t=1$
Husband in dead-end job	0.246	0.741***	-0.294	0.070	-0.509***	0.098
	(0.187)	(0.173)	(0.182)	(0.145)	(0.140)	(0.131)
Husband in career-oriented job	0.103	0.912***	-0.308*	0.326**	-0.361***	-0.119
	(0.182)	(0.158)	(0.178)	(0.141)	(0.121)	(0.124)
Husband in dead-end*Imm.	-0.479	-0.931	-0.259	0.229	0.023	0.762
	(0.634)	(0.615)	(0.548)	(0.553)	(0.624)	(0.708)
Husband in career-oriented*Imm.	0.272	-0.868	-0.418	0.299	-0.208	0.175
	(0.618)	(0.577)	(0.576)	(0.564)	(0.572)	(0.693)
Age	0.126**	0.072	-0.216***	-0.055	-0.192***	-0.057
	(0.064)	(0.049)	(0.061)	(0.046)	(0.042)	(0.043)
Age squared	-0.002***	-0.001**	0.002***	0.000	0.002***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Husband age	-0.065	-0.085*	-0.071	0.016	-0.050	0.049
	(0.063)	(0.050)	(0.061)	(0.045)	(0.042)	(0.042)
Husband age squared	0.001	0.001*	0.001	-0.000	0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Age * Imm.	0.426**	-0.060	-0.048	-0.062	0.125	0.112
	(0.194)	(0.169)	(0.172)	(0.148)	(0.175)	(0.174)
Age squared * Imm.	-0.005**	0.001	0.000	0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Husband age *Imm.	-0.240	0.043	0.247	-0.130	0.181	-0.009
	(0.179)	(0.168)	(0.175)	(0.147)	(0.175)	(0.194)
Husband age squared*Imm.	0.002	-0.000	-0.003	0.001	-0.003	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Years since migration (YSM)	-0.104	0.239	-0.047	0.127	0.512**	-0.102
	(0.247)	(0.255)	(0.272)	(0.245)	(0.234)	(0.221)
YSM squared	0.002	0.002	0.004	0.005	-0.018***	0.007
	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Husband YSM	-0.069	-0.126	0.533*	-0.144	-0.565**	0.077
	(0.253)	(0.271)	(0.310)	(0.255)	(0.229)	(0.247)
Husband YSM squared	0.001	-0.002	-0.015**	-0.003	0.016***	-0.006
	(0.007)	(0.006)	(0.007)	(0.006)	(0.005)	(0.006)

Table A1-2. Multinomial Coefficient Estimates (continued)

Dependent Variable:	Wife's Occupation State in Year 1 (1996-2002)					
	From $S_{t-1} = 0$		From $S_{t-1} = 1$		From $S_{t-1} = 2$	
Wife's Occupation State in Year 2	To $S_t = 1$	To $S_t = 2$	To $S_t = 0$	To $S_t = 2$	To $S_t = 0$	To $S_t = 1$
Education	-0.066**	0.162***	-0.075**	0.105***	-0.150***	-0.288***
	(0.026)	(0.020)	(0.030)	(0.021)	(0.016)	(0.017)
Husband Education	-0.025	-0.009	0.024	0.009	0.023	-0.038**
	(0.023)	(0.016)	(0.024)	(0.016)	(0.014)	(0.015)
Education*Imm.	0.094*	-0.052	0.036	-0.010	0.005	0.141***
	(0.051)	(0.049)	(0.055)	(0.047)	(0.047)	(0.044)
Husband education*Imm.	-0.026	-0.017	-0.030	-0.039	-0.026	0.048
	(0.048)	(0.045)	(0.052)	(0.046)	(0.042)	(0.043)
Number of children below age 6	-0.418***	-0.325***	0.318***	0.071	0.223***	-0.066
	(0.084)	(0.061)	(0.099)	(0.072)	(0.061)	(0.065)
Number of children below age 18	0.119***	0.048	0.067	-0.006	0.058*	0.057*
	(0.043)	(0.035)	(0.051)	(0.033)	(0.035)	(0.032)
# of children below age 6*Imm.	0.416*	-0.088	-0.086	-0.496	-0.087	0.468*
	(0.224)	(0.251)	(0.306)	(0.302)	(0.293)	(0.269)
# of children below age 18*Imm.	-0.030	0.051	-0.220	-0.042	-0.091	-0.188
	(0.126)	(0.128)	(0.151)	(0.122)	(0.151)	(0.142)
Husband's income	-0.006***	-0.002***	0.004***	0.001	0.003***	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Husband's income*Imm.	-0.001	0.003	0.022***	0.010*	0.002	-0.001
	(0.004)	(0.002)	(0.007)	(0.006)	(0.002)	(0.004)
Family non-labor income	-0.023***	-0.004*	0.004	0.005**	0.004***	0.002
	(0.006)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)
Family non-labor income*Imm.	0.015	-0.007	-0.010	0.010	-0.010	-0.022
	(0.014)	(0.010)	(0.019)	(0.010)	(0.007)	(0.015)
Observation	9331		6166		22487	

Dummy Variables: Calendar Year, Country of Origin, Wife & Husband Entry Year, Family Type

Table A2-1. Evaluation Results: $p^{nat}_{s_t|s_{t-1}=not-working}\left(x;\theta_{s_{t-1}}\right)$ and $p^{imm}_{s_t|s_{t-1}=not-working}\left(x;\theta_{s_{t-1}}\right)$ evaluated at (age^w,age^h,ysm)

	Transition Probabilities from $S_{t-1}=0$ (Not Working) to S_t											
	Native			C.S. America			Europe			Asia		
S_t :	0	1	2	0	1	2	0	1	2	0	1	2
Husband in 0												
$(24, 27, 0)$	0.77***	0.14***	0.09***	0.74***	0.24	0.02	0.81***	0.16	0.03	0.77***	0.20	0.03
	(0.03)	(0.03)	(0.02)	(0.24)	(0.25)	(0.03)	(0.20)	(0.20)	(0.05)	(0.21)	(0.21)	(0.04)
$(30, 33, 6)$	0.83***	0.11***	0.06***	0.81***	0.15*	0.03	0.86***	0.10	0.04	0.84***	0.12	0.04
	(0.02)	(0.02)	(0.01)	(0.09)	(0.09)	(0.03)	(0.08)	(0.08)	(0.04)	(0.08)	(0.08)	(0.03)
$(36, 39, 12)$	0.85***	0.09***	0.06***	0.86***	0.08	0.06	0.87***	0.05	0.08	0.86***	0.06	0.07
	(0.02)	(0.02)	(0.01)	(0.07)	(0.06)	(0.05)	(0.08)	(0.04)	(0.07)	(0.07)	(0.05)	(0.06)
$(42, 45, 18)$	0.84***	0.10***	0.06***	0.81***	0.03	0.16	0.79***	0.02	0.19	0.80***	0.02	0.18
	(0.02)	(0.02)	(0.01)	(0.15)	(0.03)	(0.15)	(0.18)	(0.02)	(0.19)	(0.16)	(0.03)	(0.16)
Husband in 1												
$(24, 27, 0)$	0.67***	0.17***	0.16***	0.78***	0.19	0.02	0.84***	0.13	0.03	0.82***	0.16	0.03
	(0.03)	(0.03)	(0.02)	(0.20)	(0.20)	(0.03)	(0.16)	(0.16)	(0.05)	(0.17)	(0.17)	(0.04)
$(30, 33, 6)$	0.76***	0.12***	0.12***	0.85***	0.12**	0.03	0.89***	0.07	0.04	0.87***	0.09*	0.04
	(0.02)	(0.02)	(0.01)	(0.06)	(0.06)	(0.02)	(0.06)	(0.06)	(0.03)	(0.06)	(0.05)	(0.02)
$(36, 39, 12)$	0.78***	0.12***	0.10***	0.88***	0.06*	0.06	0.89***	0.04	0.08	0.88***	0.05	0.07
	(0.02)	(0.02)	(0.01)	(0.05)	(0.03)	(0.04)	(0.06)	(0.03)	(0.06)	(0.05)	(0.03)	(0.05)
$(42, 45, 18)$	0.75***	0.13***	0.11***	0.82***	0.02	0.15	0.80***	0.01	0.19	0.81***	0.02	0.17
	(0.02)	(0.02)	(0.01)	(0.13)	(0.02)	(0.13)	(0.17)	(0.02)	(0.17)	(0.15)	(0.02)	(0.15)
Husband in 2												
$(24, 27, 0)$	0.68***	0.14***	0.19***	0.69***	0.29	0.03	0.77***	0.19	0.04	0.73***	0.24	0.03
	(0.03)	(0.03)	(0.03)	(0.26)	(0.27)	(0.04)	(0.22)	(0.22)	(0.05)	(0.23)	(0.24)	(0.04)
$(30, 33, 6)$	0.77***	0.10***	0.13***	0.79***	0.17**	0.04	0.84***	0.11	0.05	0.82***	0.14**	0.04
	(0.02)	(0.01)	(0.01)	(0.08)	(0.08)	(0.02)	(0.08)	(0.08)	(0.04)	(0.07)	(0.07)	(0.03)
$(36, 39, 12)$	0.80***	0.09***	0.12***	0.84***	0.09**	0.07*	0.85***	0.05	0.09	0.85***	0.07*	0.08*
	(0.01)	(0.01)	(0.01)	(0.06)	(0.05)	(0.05)	(0.07)	(0.04)	(0.06)	(0.06)	(0.04)	(0.05)
$(42, 45, 18)$	0.78***	0.09***	0.13***	0.78***	0.03	0.18	0.76***	0.02	0.22	0.77***	0.02	0.20
	(0.02)	(0.01)	(0.01)	(0.15)	(0.03)	(0.15)	(0.18)	(0.02)	(0.18)	(0.16)	(0.02)	(0.17)

Table A2-2. $p^{imm}_{s_t|s_{t-1}=not-working}\left(x;\theta_{s_{t-1}}\right) - p^{nat}_{s_t|s_{t-1}=not-working}\left(x;\theta_{s_{t-1}}\right)$ evaluated at (age^w,age^h,ysm)

	Difference in Transition Probabilities from $S_{t-1}=0$ (Not Working) to S_t								
	C.S. America			Europe			Asia		
S_t :	0	1	2	0	1	2	0	1	2
Husband in 0									
$(24, 27, 0)$	-0.03	0.10	-0.06*	0.04	0.02	-0.05	0.00	0.05	-0.06
	(0.24)	(0.25)	(0.04)	(0.20)	(0.20)	(0.05)	(0.21)	(0.21)	(0.04)
$(30, 33, 6)$	-0.02	0.05	-0.03	0.03	-0.01	-0.02	0.01	0.02	-0.02
	(0.09)	(0.09)	(0.03)	(0.09)	(0.08)	(0.04)	(0.08)	(0.08)	(0.03)
$(36, 39, 12)$	0.01	-0.01	0.01	0.02	-0.04	0.03	0.01	-0.03	0.02
	(0.07)	(0.06)	(0.05)	(0.08)	(0.05)	(0.07)	(0.07)	(0.05)	(0.06)
$(42, 45, 18)$	-0.03	-0.07*	0.10	-0.05	-0.08***	0.13	-0.04	-0.08**	0.11
	(0.15)	(0.04)	(0.15)	(0.18)	(0.03)	(0.19)	(0.16)	(0.03)	(0.16)
Husband in 1									
$(24, 27, 0)$	0.11	0.02	-0.14***	0.17	-0.05	-0.13***	0.15	-0.01	-0.13***
	(0.20)	(0.20)	(0.04)	(0.16)	(0.16)	(0.05)	(0.17)	(0.17)	(0.04)
$(30, 33, 6)$	0.09	-0.01	-0.08***	0.13**	-0.05	-0.08**	0.11**	-0.03	-0.08***
	(0.06)	(0.06)	(0.02)	(0.06)	(0.06)	(0.03)	(0.06)	(0.05)	(0.03)
$(36, 39, 12)$	0.10*	-0.06	-0.04	0.11*	-0.08**	-0.03	0.11*	-0.07**	-0.03
	(0.05)	(0.04)	(0.04)	(0.07)	(0.03)	(0.06)	(0.06)	(0.03)	(0.05)
$(42, 45, 18)$	0.07	-0.11***	0.04	0.04	-0.12***	0.07	0.06	-0.11***	0.06
	(0.14)	(0.03)	(0.14)	(0.17)	(0.02)	(0.17)	(0.15)	(0.03)	(0.15)
Husband in 2									
$(24, 27, 0)$	0.01	0.15	-0.16***	0.09	0.06	-0.15***	0.05	0.10	-0.15***
	(0.26)	(0.26)	(0.04)	(0.22)	(0.22)	(0.06)	(0.23)	(0.23)	(0.05)
$(30, 33, 6)$	0.02	0.08	-0.10***	0.07	0.01	-0.08**	0.05	0.04	-0.09***
	(0.08)	(0.08)	(0.03)	(0.08)	(0.08)	(0.04)	(0.07)	(0.07)	(0.03)
$(36, 39, 12)$	0.04	0.00	-0.04	0.06	-0.03	-0.02	0.05	-0.02	-0.03
	(0.06)	(0.05)	(0.05)	(0.07)	(0.04)	(0.06)	(0.06)	(0.04)	(0.05)
$(42, 45, 18)$	0.01	-0.06*	0.05	-0.02	-0.07***	0.09	-0.01	-0.07**	0.08
	(0.15)	(0.03)	(0.15)	(0.18)	(0.02)	(0.19)	(0.16)	(0.03)	(0.17)

Table A3-1. Evaluation Results: $p^{nat}_{s_t|s_{t-1}=career}\left(x;\theta_{s_{t-1}}\right)$ and $p^{imm}_{s_t|s_{t-1}=career}\left(x;\theta_{s_{t-1}}\right)$ evaluated at (age^w,age^h,ysm)

	Transition Probabilities from $S_{t-1}=2$ (Career Jobs) to S_t											
	Native			C.S. America			Europe			Asia		
S_t :	0	1	2	0	1	2	0	1	2	0	1	2
Husband in 0												
$(24,27,0)$	0.11***	0.15***	0.74***	0.11	0.18	0.71***	0.13	0.11	0.76***	0.14	0.10	0.76***
	(0.02)	(0.02)	(0.03)	(0.15)	(0.23)	(0.25)	(0.17)	(0.15)	(0.21)	(0.18)	(0.14)	(0.21)
$(30,33,6)$	0.09***	0.14***	0.77***	0.09	0.26	0.66***	0.11	0.16	0.73***	0.12	0.14	0.74***
	(0.01)	(0.02)	(0.02)	(0.07)	(0.17)	(0.17)	(0.09)	(0.12)	(0.14)	(0.09)	(0.11)	(0.12)
$(36,39,12)$	0.07***	0.15***	0.78***	0.05	0.26	0.69***	0.06	0.16	0.77***	0.07	0.15	0.78***
	(0.01)	(0.02)	(0.02)	(0.05)	(0.17)	(0.16)	(0.06)	(0.13)	(0.13)	(0.06)	(0.11)	(0.12)
$(42,45,18)$	0.06***	0.15***	0.79***	0.02	0.22	0.76***	0.03	0.13	0.84***	0.03	0.12	0.85***
	(0.01)	(0.02)	(0.02)	(0.03)	(0.20)	(0.19)	(0.04)	(0.14)	(0.14)	(0.04)	(0.12)	(0.13)
Husband in 1												
$(24,27,0)$	0.07***	0.16***	0.77***	0.06	0.38	0.56*	0.08	0.25	0.67***	0.09	0.23	0.68***
	(0.01)	(0.02)	(0.02)	(0.09)	(0.33)	(0.31)	(0.11)	(0.26)	(0.26)	(0.12)	(0.24)	(0.24)
$(30,33,6)$	0.06***	0.15***	0.79***	0.04	0.47***	0.49***	0.06	0.33**	0.61***	0.07	0.30***	0.63***
	(0.01)	(0.01)	(0.01)	(0.03)	(0.16)	(0.15)	(0.05)	(0.15)	(0.14)	(0.05)	(0.13)	(0.13)
$(36,39,12)$	0.05***	0.15***	0.80***	0.03	0.48***	0.49***	0.04	0.34***	0.62***	0.04	0.31**	0.64***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.16)	(0.15)	(0.03)	(0.16)	(0.16)	(0.03)	(0.14)	(0.14)
$(42,45,18)$	0.04***	0.16***	0.81***	0.01	0.43*	0.55**	0.02	0.30	0.68***	0.02	0.27	0.70***
	(0.00)	(0.01)	(0.01)	(0.02)	(0.24)	(0.24)	(0.02)	(0.22)	(0.22)	(0.02)	(0.20)	(0.20)
Husband in 2												
$(24,27,0)$	0.09***	0.13***	0.79***	0.08	0.20	0.72***	0.09	0.12	0.78***	0.10	0.11	0.79***
	(0.01)	(0.02)	(0.02)	(0.10)	(0.23)	(0.23)	(0.12)	(0.15)	(0.18)	(0.13)	(0.14)	(0.17)
$(30,33,6)$	0.07***	0.12***	0.81***	0.06	0.27**	0.67***	0.08	0.17*	0.75***	0.08	0.15**	0.76***
	(0.01)	(0.01)	(0.01)	(0.04)	(0.13)	(0.12)	(0.05)	(0.09)	(0.10)	(0.05)	(0.08)	(0.09)
$(36,39,12)$	0.06***	0.12***	0.82***	0.04	0.27**	0.69***	0.05	0.17*	0.78***	0.06	0.15*	0.79***
	(0.01)	(0.01)	(0.01)	(0.03)	(0.12)	(0.12)	(0.04)	(0.10)	(0.10)	(0.04)	(0.08)	(0.09)
$(42,45,18)$	0.05***	0.12***	0.83***	0.02	0.23	0.75***	0.02	0.14	0.84***	0.03	0.13	0.85***
	(0.00)	(0.01)	(0.01)	(0.02)	(0.17)	(0.17)	(0.03)	(0.12)	(0.13)	(0.03)	(0.11)	(0.11)

Table A3-2. $p^{imm}_{s_t|s_{t-1}=career}\left(x;\theta_{s_{t-1}}\right) - p^{nat}_{s_t|s_{t-1}=career}\left(x;\theta_{s_{t-1}}\right)$ evaluated at (age^w,age^h,ysm)

	Difference in Transition Probabilities from $S_{t-1}=2$ (Career Jobs) to S_t								
	C.S. America			Europe			Asia		
S_t :	0	1	2	0	1	2	0	1	2
Husband in 0									
$(24, 27, 0)$	0.00	0.03	-0.04	0.02	-0.04	0.01	0.03	-0.05	0.02
	(0.15)	(0.23)	(0.25)	(0.17)	(0.15)	(0.21)	(0.18)	(0.14)	(0.21)
$(30, 33, 6)$	-0.01	0.12	-0.11	0.02	0.02	-0.04	0.02	0.00	-0.03
	(0.07)	(0.17)	(0.17)	(0.09)	(0.12)	(0.14)	(0.09)	(0.11)	(0.12)
$(36, 39, 12)$	-0.02	0.11	-0.09	-0.01	0.01	0.00	0.00	0.00	0.01
	(0.05)	(0.17)	(0.17)	(0.06)	(0.13)	(0.13)	(0.06)	(0.11)	(0.12)
$(42, 45, 18)$	-0.03	0.07	-0.03	-0.03	-0.02	0.04	-0.02	-0.03	0.05
	(0.03)	(0.20)	(0.20)	(0.04)	(0.14)	(0.14)	(0.04)	(0.13)	(0.13)
Husband in 1									
$(24, 27, 0)$	-0.01	0.22	-0.21	0.01	0.09	-0.10	0.02	0.07	-0.09
	(0.09)	(0.33)	(0.31)	(0.11)	(0.26)	(0.25)	(0.12)	(0.24)	(0.24)
$(30, 33, 6)$	-0.01	0.32**	-0.30**	0.00	0.17	-0.18	0.01	0.15	-0.16
	(0.03)	(0.16)	(0.15)	(0.05)	(0.15)	(0.14)	(0.05)	(0.13)	(0.13)
$(36, 39, 12)$	-0.02	0.33**	-0.31**	-0.01	0.19	-0.18	-0.01	0.16	-0.16
	(0.02)	(0.16)	(0.15)	(0.03)	(0.16)	(0.16)	(0.03)	(0.14)	(0.14)
$(42, 45, 18)$	-0.02	0.27	-0.25	-0.02	0.14	-0.12	-0.02	0.12	-0.10
	(0.02)	(0.24)	(0.24)	(0.02)	(0.22)	(0.22)	(0.02)	(0.20)	(0.20)
Husband in 2									
$(24, 27, 0)$	-0.01	0.07	-0.07	0.01	0.00	0.00	0.01	-0.02	0.00
	(0.10)	(0.23)	(0.23)	(0.12)	(0.15)	(0.18)	(0.13)	(0.14)	(0.17)
$(30, 33, 6)$	-0.01	0.15	-0.14	0.00	0.05	-0.05	0.01	0.03	-0.04
	(0.04)	(0.12)	(0.12)	(0.05)	(0.09)	(0.10)	(0.05)	(0.08)	(0.09)
$(36, 39, 12)$	-0.02	0.15	-0.13	-0.01	0.05	-0.04	-0.01	0.03	-0.03
	(0.03)	(0.12)	(0.12)	(0.04)	(0.10)	(0.10)	(0.04)	(0.08)	(0.09)
$(42, 45, 18)$	-0.03	0.10	-0.07	-0.02	0.02	0.01	-0.02	0.00	0.02
	(0.02)	(0.17)	(0.17)	(0.03)	(0.12)	(0.13)	(0.03)	(0.11)	(0.11)