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Published online: 05 Apr 2019.

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Until work do us part: Labour migration and occupational stratification in non-cohabiting marriage

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While recent decades have seen considerable research on cohabitation without marriage, the study of marriage without cohabitation has not fared as well. Prior work on the latter has emphasized the importance of occupational stratification, but ignored the social context around occupation, particularly regarding labour mobility and economic development. In this paper, we outline the significance of contemporary labour mobility and concomitant occupational stratification for the risk of non-cohabiting marriage, and use data from the IPUMS–International project to provide a cross-national accounting of non-cohabiting marriage. We focus on two issues: first, how does prevalence vary across countries, across time, and with respect to economic development? Second, how do the core dynamics of labour mobility —including migration, occupational status, and economic development—influence the probability of non-cohabiting marriage? Results indicate broad cross-national differences in prevalence, increasing risk over time, and a pattern of accumulating risk associated with multifaceted social disadvantage.

Introduction

While the recognition of emerging and non-traditional relationship forms is not new, cultural and economic transformations across the globe have fuelled speculation that non-traditional forms are increasingly prevalent. One particularly salient vein of research has focused on the rise of non-cohabiting marriage among three types of couples: those in 'commuter relationships' (Gerstel and Engel Gross 1982; Anderson and Spruill 1993; Green et al. 1999; Mulder and Hooimeijer 1999; Van der Klis and Mulder 2008), those who 'live apart together' (Levin 2004; Haskey and Lewis 2006; Ermisch and Siedler 2009; Régnier-Loilier et al. 2009; Strohm et al. 2009; Reimondos et al. 2011), and those who are part of 'transnational families' (Parreñas 2001; Bryceson and Vuorela 2002; Cherlin 2010; Reynolds et al. 2010). Such work is typically associated with the study of the Second Demographic Transition, which emphasizes changes in norms and values that foster the emergence and increased prevalence of relationships that deviate from the 'traditional' form where married partners co-reside (Van de Kaa 1994; Lesthaeghe 2010).

While we have no quarrel with key arguments surrounding a Second Demographic Transition, an alternative account of non-cohabiting marriage focuses on the key features of labour mobility associated with late globalization. At a macro level, migration is intertwined with economic and social development, such that the world becomes differentiated into 'sending' and 'receiving' countries (Sassen 1999; Pritchett 2006). Such differentiation reflects geographic mobility, where individuals seek to maximize opportunities for paid labour by relocating to markets perceived to be more lucrative (Borjas 1989). Thus, labour mobility has three empirical trappings. First, it involves issues of migration and geographic mobility: people change countries in pursuit of better jobs (Olwig and Nyberg Sorensen 2003). Second, such migration is further connected to socio-economic location, with complicated relationships between human capital, occupation in country of origin, and occupation in the destination country (Fielding 1992; Platt 2005). Third, economic development is a key element, given long-standing principles of the economics of migration that stress variation in labour markets as key drivers of geographic mobility

(Borjas 1989). Importantly, these issues have implications for the structure of families and households when we recognize that the 'new economics of labour migration' views families not as a holistic, inseparable collective but as entities that can collectively maximize labour market returns by diversifying activities across a range of markets—markets that are not necessarily geographically contiguous (Stark and Bloom 1985).

Neither the implications of these dynamics for relationships, nor the specific question of cohabitation among marital partners have been fully explored. And, in the absence of such work, research on non-cohabiting marriages has largely focused on 'high development' contexts (particularly North America and Europe), has emphasized people in the middle and at the upper end of the occupational spectrum, and, of late, has highlighted norms and values associated with a Second Demographic Transition as factors that cause married partners to live apart. Ultimately, such scope limitations may undermine a fuller understanding of the social dynamics underlying non-cohabiting marriages, and could present a misleading picture of the relationship between such marriages and broader social changes associated with globalization and modernization.

From this backdrop, our work makes three contributions. First, we describe a multilevel framework organized around the dynamics of labour mobility in the modern world and link it to the risk of non-cohabiting marriage. Second, we use high-quality, harmonized census data from the International Public Use Microdata Series–International (IPUMS–I) project to document the cross-national, economic developmental, and temporal character of non-cohabiting marriage. Our data come from 206 censuses in 70 countries, covering 51 years between 1960 and 2015, and hence provide a broad view of cross-national variation in non-cohabiting marriage. Finally, we estimate multilevel, hierarchical interaction models that allow for the estimation of labour mobility processes, captured as the interactions between migration, occupational status, and economic development. Moreover, given that all these dynamics are highly gendered, we estimate models separately for women and men, and assess the similarities and differences in parameters across sex.

couples not living together. In perhaps the seminal work on the topic, Rindfuss and Stephen (1990) estimated an overall prevalence of about 5 per cent of marriages being without cohabitation for the United States (US) in the 1980s, and highlighted variation by occupation, age, cohort, and race. An emphasis on work and occupation was also seen in earlier research, which highlighted military service, incarceration, and the mass employment of married women as increasing the risk of not living with one's spouse (Gerstel and Engel Gross 1982; Hunter 1982; Ferraro et al. 1983). The spectrum of occupations has also appeared in more recent studies emphasizing 'commuter couples', 'living apart together', and 'transnational families' (Anderson and Spruill 1993; Green et al. 1999; Mulder and Hooimeijer 1999; Van der Klis and Mulder 2008; Ermisch and Siedler 2009; Strohm et al. 2009; Van der Klis and Karsten 2009).

While such work has provided a fruitful launching pad for further inquiry, there are clear limitations of scope. Prior work has almost always focused on a distinct country and time period, and hence been silent on the broader context of occupational stratification and its relationships to labour mobility and socio-economic development, and on how these factors might increase or decrease the risk of partners not cohabiting. This latter perspective broadens thinking about non-cohabiting marriage beyond the idea that it is yet another feature of the Second Demographic Transition (Van de Kaa 1994; Lesthaeghe 2010) and instead emphasizes core features of contemporary economic globalization. We elaborate these themes in the following section by first highlighting the key individual factors, then the country-level dimension, followed by a synthesizing discussion.

Labour mobility, occupation, and economic development, and their implications for non-cohabiting marriage

This section elaborates the different elements of our labour mobility perspective, specifies the links between them, and then elaborates further contingencies by sex.

Risk factors for non-cohabiting marriage

While the majority of people in couples co-reside with their partner, there are important social dynamics that increase the likelihood of married

Migration

The impact of migration on marriage and co-residence is seen in work associated with the 'new economics of labour migration' (Stark and Bloom 1985).

Here, household members act collectively to maximize economic returns to the household in general, and do so by diversifying their economic activities across a range of labour markets. Market limitations in one context are offset by the migration of best-suited family members to more advantageous contexts. Importantly, this perspective accords no special status to co-residence among family members and instead views the family unit as separable into discrete units of labour, as long as there is labour market utility in doing so. From this perspective, marriage has no necessary association with likelihood of migration, and migration may undermine the co-residence of spouses, as partners separate into different labour markets. Consistent with this, various studies have shown that spending some time in a non-cohabiting marriage is the norm among Mexican migrants to the US (Blank 1998; Cerrutti and Massey 2001; Van Hook and Glick 2007; Glick 2010).

Work and occupation

In addition to migration, a second dynamic covers work and occupation, which are intrinsic to labour mobility in that people seek to alter and improve their conditions of work through geographic mobility (Borjas 1987). Here, a variety of disciplines have highlighted how the contemporary world increasingly produces occupational differentiation, both in terms of the types of jobs and in terms of the quality or meaning of work for individuals (Sassen 1999; Parreñas 2001). Derivative of this, there are two primary reasons why work is likely to be important for the risk of non-cohabitation among married couples. First, work is a key determinant of economic resources, which are the fundamental underpinnings of social life. Here, different types of jobs in different sectors of the economy produce different levels of income. Although there are a variety of complex conceptualizations, there is widespread evidence that jobs with higher prestige, status, and authority typically generate higher incomes (Hauser and Warren 1997). At the same time, research in family social science and demography has shown income—both family and individual—to be strongly correlated with household structure and composition (Angel and Tienda 1982; McLanahan 1988).

Second, work is a unique arena of social life and the diversity of work environments reflects the intersection of particular types of jobs, geographic contexts, and residential locations (Sassen 1999). While some types of jobs are strongly rooted in local contexts, others involve significant spatial mobility or segregation of workers from traditional neighbourhoods and familial settings. We conceptualize this as an issue of institutionalization, where more institutionalized work is grounded in a particular geography, imprints the community economically and culturally, and spawns collateral institutions (e.g., schools and businesses). Collectively, this allows for better integration of family life. For example, research on nannies has indicated high levels of non-cohabiting marriage in this group, reflecting the transnational and grey-market qualities of such work (Ehrenreich and Hochschild 2003). In contrast, those who work in fishing, mining, and formal agriculture, even though their occupational status is similarly low, typically have work grounded in particular communities that develop ancillary businesses, industries, and institutions (e.g., schools, social services) that help to integrate work and family life (Acheson 1981; Strangleman 2001). With these orienting principles, we would expect workers in higher-status occupations, and in occupations with higher institutionalization regardless of status, to have lower risks of non-cohabiting marriage. This distinction may be particularly significant in differentiating more institutionalized, low-status blue-collar occupations from less institutionalized, low-status elementary occupations.

Economic development

Our macro-level accounting of the risks of non-cohabiting marriage focuses on economic development. It is widely recognized that economic development occurs alongside a wide array of social and political change. Indeed, 'modernity', as a complex of cultural and institutional change over the last 150 years, is strongly intertwined with dramatic increases in economic activity, wages, and wealth (Therborn 1995). The generalized integration of the different spheres of social life is a key element of such processes, and core institutions increasingly structure the nature of activities within different life domains and coordinate activities across different domains (Esping-Andersen 1999). Given this, we might expect low levels of economic development, captured, for example, by low gross domestic product (GDP) per capita, to be associated with a greater risk of non-cohabiting marriage, as the process of developing policies and institutions that help to integrate work and family would still be ongoing. At the same time, advanced economies possess their own contradictions and conditions that shape family and fertility processes (Esping-Andersen 2009). Given this, we might

expect increased risk with increased economic development. Still, the question of how development influences the risk of couples living apart is ultimately an empirical one that requires comparison of countries across the developmental continuum. To date, such research has been lacking.

Contingencies

There are good reasons to view the influences of migration, work, occupation, and economic development for non-cohabiting marriage as contingent rather than independent. There is a broad literature showing occupational variation in wages based on nativity (Borjas 1987). Such work has typically acknowledged the existence of a dual labour market, with migrants more likely than natives to operate in the 'secondary' rather than 'primary' market (Reich et al. 1973). Given this, people that technically do the same job often experience dramatically different social and economic rewards depending on the broader structure of the labour market, which is typically dependent on the level of economic development.

Extrapolating from such work, the risk of non-cohabiting marriage across occupations could vary by migration status due to variation in wages alone. Differences in the institutionalization of occupations based on sector and enclave would also provide a rationale for different effects. The economics of migration has long held that people move from lower- to higher-wage markets, but empirical work has shown this to be a much subtler process, which is highly dependent on relative, rather than absolute, differences (Stark and Bloom 1985). Migration to a more advanced economy could, for example, produce wages for lower-status occupations that are de facto higher than wages for higher-status occupations in the origin country economy. Hence, the consequences of migration and work for relationships and family would further vary by economic context. Such differences may also reflect state policies around migration. Here, countries with higher levels of economic development typically have migration policies that allow for family unification if certain criteria—often directly related to high human capital, high occupational status, and consequent income—are met (Freeman 1992). Again, such questions are ultimately empirical, and our research seeks to flesh out how level of development, migration, and occupation intersect in shaping the risk of non-cohabiting marriage.

Sex

There are also reasons to think of sex as conditioning the macro- and micro-determinants of non-cohabiting marriage. At a macro level, social systems are strongly gendered, and processes of economic and social development modify rather than erase gendered social structures. As a consequence, social experience at different levels of development remains highly gendered (Mason and Jensen 1995; Scott 1995). In practice, the field of family studies has generally been organized around sex differentiation in roles, statuses, and authority in paid employment, with a key theme of consequent disadvantage for females in the operation of family life (Thompson and Walker 1989).

Consistent with this, there is a large literature on gender differences in paid employment, which documents financial disadvantages and variations in conditions of work for women, even when doing (at least nominally) the same job as men (Blau and Kahn 1992). Equally important, the pervasiveness of occupational sex segregation means that women and men may actually do quite different work, with quite different perceived prestige and quite different benefits, even though the jobs themselves fall under the same labels (e.g., manager, supervisor) (Charles and Grusky 2005). Such differentiation has profound consequences for women's status within families, consequent decision-making, and ultimately the structure of families and households.

The gendered nature of occupations is likely to have further implications for the migration–development nexus. Volumes of research have pointed to the gendered nature of migration, with women and men having quite different life cycle dynamics, different precursors to migration, and ultimately different experiences (Tienda and Booth 1991; Cerrutti and Massey 2001). Specifically, men are typically migration leaders and women are more likely to be subsequent, and often reluctant, migrants (Curran and Rivero-Fuentes 2003). Sex differences in the timing of migrations may interact with the level of economic development, given basic principles of labour migration. If patterns of migration typically involve moves from lower- to higher-income environments, we might anticipate higher levels of development decreasing the likelihood of non-cohabitation with the spouse among women (i.e., those left behind and hence surveyed in the lower-income origin country) yet increasing the likelihood among men (i.e., those migrating first and hence surveyed in the higher-income destination country).

In most contexts, occupation either facilitates entry into a destination country or facilitates spousal reunification. As Raghuram (2004) has noted, this process is highly gendered, and is connected in important ways to family dynamics. Stronger occupational standing may be particularly significant for men in more highly developed destination countries as it would provide a mechanism to bring migrating spouses together. There is also no reason to assume that the process is symmetrical, and it may be less a pattern of advantage and more a pattern of stratification through disadvantage. Women in low-status occupations may be particularly 'stuck' in less developed countries when their partner migrates and hence less likely to be cohabiting with their spouse, who is simultaneously 'stuck' in the higher-income context due to occupational disadvantage.

Research questions

Against this backdrop, we focus on two main research themes. First, what is the extent of country-level variation in non-cohabiting marriage, what are the important temporal trends, and to what degree is the prevalence of non-cohabiting marriage related to economic development? Second, how do the core social dynamics of labour mobility —specifically migration, occupation, and economic development—jointly influence the risk of non-cohabiting marriage? Ultimately, these questions provide a focus on the broad macro–micro context of non-cohabiting marriage and some perspective on the social dynamics behind alternative family forms, such as non-cohabiting marriage, in the contemporary era.

Data, measures, and methods

Data

The data we use come from the IPUMS–I project (Minnesota Population Center 2018). IPUMS–I is a high-quality census microdata set that is harmonized to allow for maximal comparability across countries and over time. For our purposes, we use a subsample of more than 9 million respondents—4,776,841 women and 4,550,334 men—randomly selected from 206 census rounds in 70 countries, covering 51 years. Our analytic sample includes countries representative of every continent, the full range of income groups in the World Bank classification, and all eleven Central Intelligence Agency (CIA)

global regions. To our knowledge, this is the broadest sample possible for a global accounting of non-cohabiting marriage and provides unique leverage in examining the broad socio-economic and developmental contexts driving labour mobility in the current period.

Measures

The IPUMS–I data include information on a range of population characteristics, including fertility, nuptiality, life course transitions, migration, labour force participation, occupational structure, education, ethnicity, and household composition. The information available in each sample varies according to the questions asked in the census year and by differences in post-enumeration processing. The focal dependent variable—being in a non-cohabiting marriage—is a dichotomous variable that flags respondents who report being married and whose household record does not include their spouse. Importantly, this includes people both in legal and custom-based marriages, which increases comparability across countries. We explicitly exclude respondents who reported being divorced or separated from their spouse. We recognize that such a measure of non-cohabiting marriage lacks information about the duration of non-cohabitation, but one-off assessments such as censuses are likely to be biased towards longer durations of separation. We also lack information about the frequency or repetitiveness of separations, and this, too, is a limitation.

As described earlier, our focus is the influence of labour mobility, as indexed by migration, occupational status, and economic development. Migration is measured in terms of country of birth and differentiates those who are foreign born (migrants) from those who are native born. Our categorization of occupation uses a simplification of the International Standard Classification of Occupations (ISCO) General coding (Ganzeboom and Treiman 1996), which differentiates upper white-collar work (i.e., 'legislators, senior officials, and managers'; 'professionals'; 'technicians and associate professionals'), lower white-collar work (i.e., 'clerks'; 'service workers, and shop and market sales'), blue-collar work (i.e., 'skilled agricultural and fishery workers'; 'crafts and related trades workers'; 'plant and machine operators and assemblers'), elementary occupations (including 'other occupations, unspecified or not elsewhere classified'), the armed forces, and those outside the labour force. While this categorization clearly captures variation in occupational

status, the distinction between blue-collar and elementary occupations also differentiates those lower-status occupations with more and less institutionalization, respectively, which may have particular significance for the risk of non-cohabiting marriage. We couple the key micro-level factors with a macro-level indicator of economic development. We index the latter using the log transformation of GDP per capita in current US dollars taken from the World Bank. In the analysis, we focus mainly on three levels of development for illustrative purposes: 'low' ($600 or 6 on the log scale), 'moderate' ($3,000 or 8 on the log scale), and 'high' ($22,000 or 10 on the log scale).

We also control for three other factors. Age is recoded to capture four age groups: 18–34, 35–49, 50–64, and 65+. These roughly capture the key life stages of the transition to adulthood, younger mid-adulthood, older mid-adulthood, and old age. We assume that age also captures important cohort and age effects on the likelihoods of marriage and migration, and on the type of occupation an individual is likely to work in. Educational attainment differentiates those with 'less than primary completed', 'primary completed', 'secondary completed', and 'university completed', coded from '1' to '4'. As with age, we expect significant correlations with migration and occupation, as well as compositional effects related to economic development. We also include a measure of the number of own children living in the household. Parenthood is part of the labour mobility process, given its recognized association with migration, employment, and development. Yet, children may also bind parents to the household. At the same time, we are concerned about causal reciprocity, in that cohabitation among married partners likely determines the number of children in the household and hence would complicate interpretation. Descriptive statistics for all measures are shown in Table 1.

Statistical analysis

With a dichotomous dependent variable, we use a logistic regression strategy. With logistic regression, the probability of observing one category of a dichotomy is modelled as a non-linear function:

$$\ln\left(\frac{P}{1-P}\right) = \alpha + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \ldots + \beta_k X_{kij} + \mu_i$$
$$+ \tau_j + \varepsilon_{ij}$$

where the natural log (ln) of the odds of being in a non-cohabiting marriage ($P/(1-P)$) is modelled as a linear function of a set of predictors (Xs). Given the possibility that country-level characteristics could bias estimates, we include country-level fixed effects, μ, to effectively control for all time-stable attributes of a country (e.g., norms favouring polygamy), as well as year fixed effects, τ, to control for any temporal trends that may exist. The idiosyncratic error term is denoted by ε. To be clear, we examine cross-national and temporal variation in the prevalence of non-cohabiting marriage as a substantive issue in the first stage of our research, but also deem it wise to mitigate at least some omitted-variables bias associated with country and period (Halaby 2004).

Logistic regression is a favourable strategy as it resolves problems of predicted values falling outside the range of possible values (i.e., greater than '1', less than '0') and heteroskedasticity in the distribution of errors (Long and Freese 2006). Although the specific utility for analyses of census data is not entirely clear, we also adjust for the clustering of the data by estimating robust standard errors. This approach is a generalization of the Huber–White sandwich estimator that relaxes the assumption of independence of errors. Finally, we estimate models separately for women and men in order to capture sex variation in estimated coefficients fully. As our work is explicitly interested in the joint effects of our labour mobility dimensions, as well as sex, we estimate a series of *N*-way interaction models: beginning with the main effects model, followed by a model with two-way interactions, and finally a model with the three-way interactions of occupation, migration, and economic development. We determine the optimal or preferred model through comparison of Bayesian Information Criterion (BIC) statistics. Models are estimated in Stata 15.1 using the 'logit' protocol.

Results

Descriptive results

A first approach to understanding the social patterning of non-cohabiting marriage considers variation in country prevalence (see Figure 1) within the largest set of IPUMS–I samples consisting of 84 countries. Against the US benchmark of approximately 5 per cent reported by Rindfuss and Stephen (1990), variation in average prevalence across countries is extreme, ranging from almost zero (in the Netherlands) to almost 40 per cent (in South Sudan). In our sample, there are 22 countries with prevalence

Table 1 Descriptive statistics for IPUMS–I sample (from 206 censuses in 70 countries, covering 51 years between 1960 and 2015)

	Females (*n* = 4,776,841)				Males (*n* = 4,550,334)			
	Mean/ percentage	Standard deviation	Minimum	Maximum	Mean/ percentage	Standard deviation	Minimum	Maximum
Non-cohabiting marriage (percentage)	6.3	–	0	1	5.1	–	0	1
Year	1993.3	14.4	1960	2015	1993.1	14.3	1960	2015
Occupation (percentage)								
Upper white-collar	10.0	–	0	1	16.3	–	0	1
Lower white-collar	12.8	–	0	1	12.8	–	0	1
Blue-collar	13.9	–	0	1	43.7	–	0	1
Elementary occupations	3.4	–	0	1	6.4	–	0	1
Armed forces	0.0	–	0	1	0.8	–	0	1
Not in labour force	59.9	–	0	1	20	–	0	1
Migrant (percentage)	5.9	–	0	1	6.3	–	0	1
Logged GDP per capita	8.269	1.645	4.371	10.903	8.289	1.655	4.371	10.903
Age group (percentage)								
18–34 years	39.1	–	0	1	29.0	–	0	1
35–49 years	33.6	–	0	1	35.5	–	0	1
50–64 years	19.4	–	0	1	23.2	–	0	1
65+ years	7.9	–	0	1	12.3	–	0	1
Educational attainment	2.086	0.978	1	4	2.172	0.999	1	4
Number of children (percentage)								
None	27.6	–	0	1	29.0	–	0	1
One	23.3	–	0	1	22.7	–	0	1
Two	22.3	–	0	1	22.0	–	0	1
Three	12.9	–	0	1	12.6	–	0	1
Four or more	13.9	–	0	1	13.7	–	0	1

Source: Authors' analysis of IPUMS–I data.

below 5 per cent (plus two with a prevalence of zero), 24 countries with prevalence between 5 and 10 per cent, 19 countries with prevalence between 10 and 15 per cent, eight countries with prevalence between 15 and 20 per cent, five countries with prevalence between 20 and 25 per cent, and six countries with prevalence above 25 per cent. Although we reserve interpretation at this point, there is evidence of a developmental gradient. Of the eleven countries with the highest prevalence (>20 per cent), seven are in the World Bank 'low' income group (Guinea, Haiti, Liberia, Senegal, Sierra Leone, South Sudan, and Tanzania) and three are in the 'lower–middle' income group (Ghana, Kenya, and the Sudan).

We develop the issue of a developmental gradient more formally by examining the relationship between prevalence of non-cohabiting marriage and logged GDP per capita. The bivariate relationship and linear trend line are shown in Figure 2. It shows three interesting features. First, there is a strong negative relationship between prevalence of non-cohabiting marriage and economic development. Average prevalence is much higher for countries where GDP per capita is less than $8,000 (9 on the log scale), a level that accounts for the majority of country–periods. Second, there is considerable heterogeneity in prevalence among this group, with prevalence ranging from close to zero to more than 40 per cent. Third, countries with
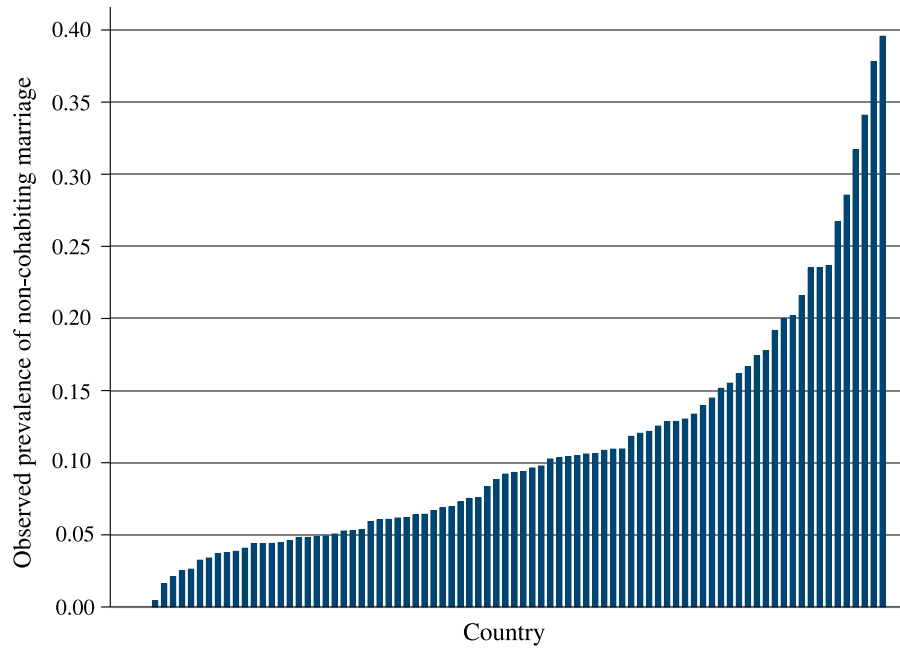
Figure 1   Observed prevalence of non-cohabiting marriage by country
Note: Prevalence refers to the percentage of marriages that are non-cohabiting.
Source: Authors' analysis of IPUMS–I data (*n* = 84 countries, 1960–2015, average value across censuses for each country).
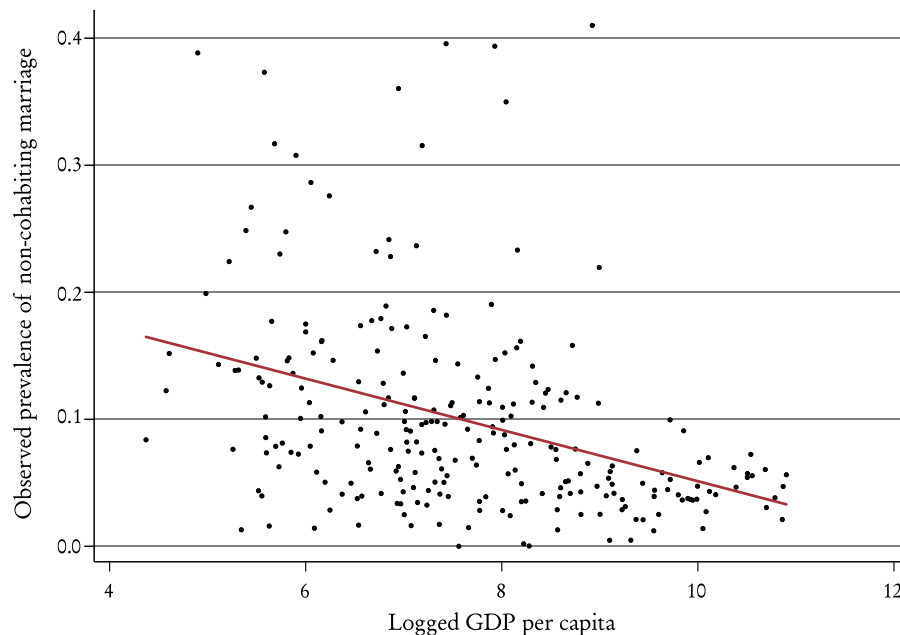

Figure 2   Observed prevalence of non-cohabiting marriage by level of economic development, with trend line
Source: Authors' analysis of IPUMS–I data (*n* = 206 censuses for 70 countries over a period of 51 years).

higher GDP per capita show much less variation, with prevalence typically less than 8 per cent. In other words, prevalence is both low and limited in variance among countries with high GDP per capita.

We further examine trends over time for the subset of countries (*n* = 70) for which there is more than one census and thus we can document change. Much like

the fuller sample, this sample contains countries representative of each continent and each of the CIA global regions. Figure 3 shows the odds ratios with confidence intervals for the regression of non-cohabiting marriage on year for each country, ordered based on magnitude of change. Change in general is not rapid. The average annual rate of
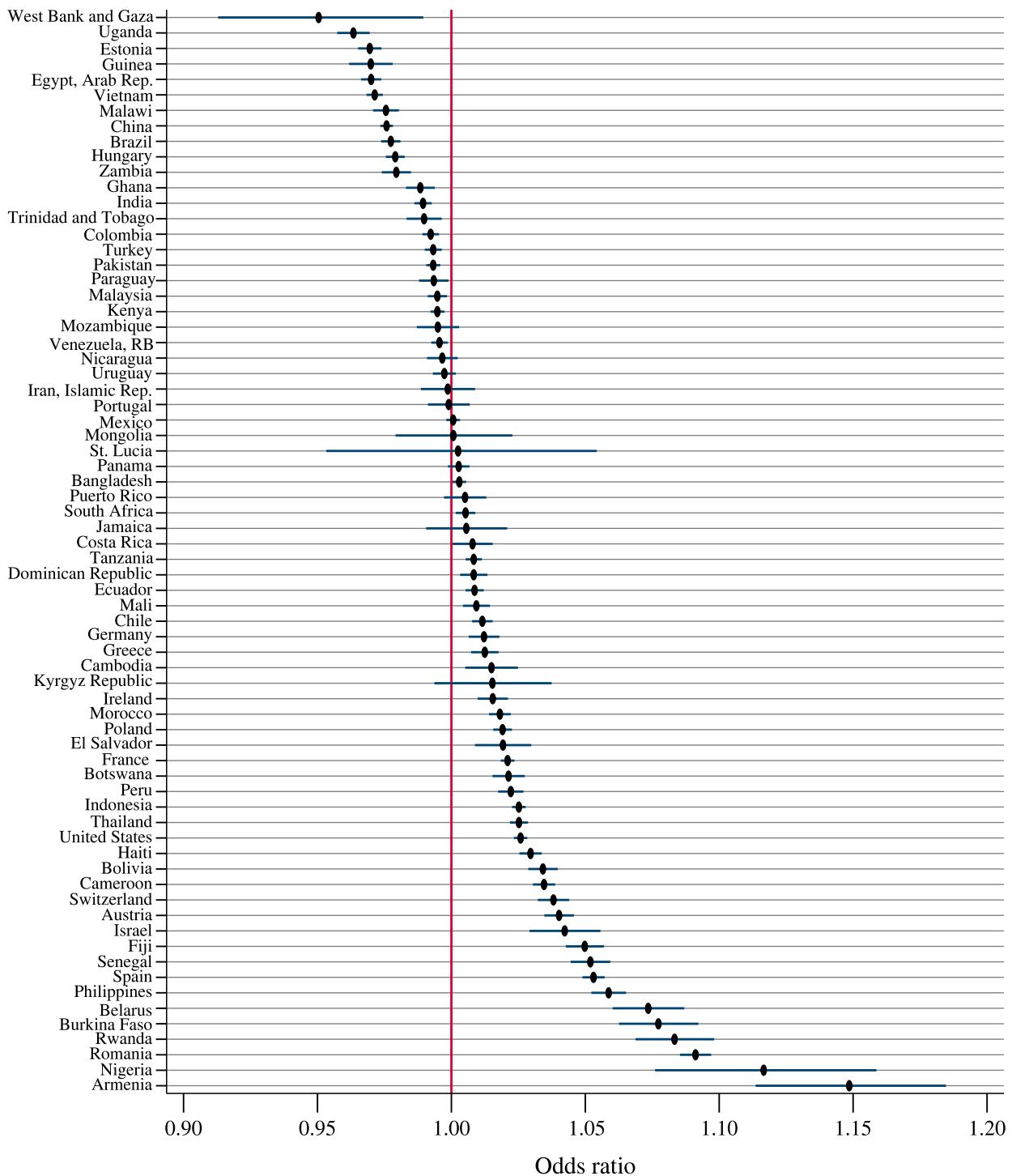
Figure 3 Annual estimated change in non-cohabiting marriage

Note: Horizontal lines denote 95 per cent confidence intervals.

Source: Authors' analysis of IPUMS–I data (*n* = 70 countries with more than one census).

change is approximately 0.0003. This suggests that the overall prevalence of non-cohabiting marriage has increased by just over 2 per cent over the 51 years of observation. There is however considerable diversity in trends over time: 21 countries show a significant negative trend over time, 14 show a null association, and 35 show a significant

positive trend. In results not shown, we further examined whether there was a pattern in the time trends with respect to extent of development, and there is some evidence that time trends become increasingly positive at higher GDPs per capita. Based on the inclusion of a product term between year and logged GDP per capita, the coefficient for year

increases from 0.018 ($z = 6.8$) when GDP per capita is $600, to 0.020 ($z = 37.6$) when GDP per capita is $3,000, and to 0.022 ($z = 74.8$) when GDP per capita is $22,000. To summarize, these results suggest considerable variation in non-cohabitating marriage across countries, coupled with strong evidence of developmental declines in prevalence. There is, however, evidence that recent years have seen a small upturn in prevalence among countries with high GDP per capita.

Multivariate results

Our multivariate analyses begin with examination of a main effects model (see Table 2). This shows that

Table 2 Logit coefficients and marginal effects: main effects of labour mobility variables on probability of non-cohabiting marriage for females and males, with select controls

Variables	Females		Males	
	β	Marginal effects	β	Marginal effects
Occupation (Reference = upper white-collar)	–	0.038	–	0.014
Lower white-collar	0.105***	0.042	0.169***	0.016
	(0.013)		(0.013)	
Blue-collar	0.015	0.038	0.001	0.014
	(0.014)		(0.011)	
Elementary occupations	0.275***	0.049	0.344***	0.020
	(0.017)		(0.015)	
Armed forces	1.096***	0.105	1.229***	0.046
	(0.093)		(0.025)	
Not in labour force	−0.112***	0.034	0.735***	0.029
	(0.012)		(0.011)	
Logged GDP per capita	−0.083***	0.040–0.032	0.063***	0.016–0.019
	(0.015)		(0.019)	
Migration status (Reference = native)	–	0.035	–	0.016
Migrant	0.489***	0.056	1.088***	0.046
	(0.011)		(0.010)	
Age group (Reference = 18–34 years)	–	0.041	–	0.026
35–49 years	−0.116***	0.037	−0.015	0.026
	(0.007)		(0.008)	
50–64 years	−0.453***	0.027	−0.970***	0.010
	(0.008)		(0.010)	
65+ years	−0.163***	0.035	−1.643***	0.005
	(0.010)		(0.013)	
Educational attainment	−0.098***	0.040–0.030	−0.144***	0.020–0.013
	(0.004)		(0.004)	
Number of children (Reference = none)	–	0.087	–	0.113
One	−0.856***	0.039	−2.173***	0.014
	(0.007)		(0.010)	
Two	−1.376***	0.023	−2.986***	0.006
	(0.008)		(0.013)	
Three	−1.489***	0.021	−3.186***	0.005
	(0.010)		(0.018)	
Four or more	−1.636***	0.018	−3.321***	0.005
	(0.009)		(0.016)	
Constant	−0.896***	–	−1.424***	–
	(0.104)		(0.129)	
Country fixed effects	Yes	–	Yes	–
Year fixed effects	Yes	–	Yes	–
BIC	115,307,860.28		82,289,178.11	
Observations	4,776,841		4,550,334	

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$.
Notes: β is the logit coefficient. Robust standard errors in parentheses. GDP per capita comparisons are estimated at values of 6 and 10 on the log scale.
Source: As for Figure 1.

the prevalence of non-cohabiting marriage among migrant women is more than 60 per cent greater than for native women (5.6 per cent vs. 3.5 per cent) and for men prevalence among migrants is almost three times greater (4.6 per cent vs. 1.6 per cent). Differences by occupation are also reasonably pronounced. Estimated prevalence is generically higher among women, although occupational stratification is similar to that of men. Among women, estimated prevalence is lowest among those in upper white-collar and blue-collar occupations (both 3.8 per cent), somewhat higher among lower white-collar workers (4.2 per cent), and even higher among those in elementary occupations (4.9 per cent). Consistent with prior work, the highest prevalence is seen among those in the armed forces (10.5 per cent), but prevalence is comparatively low among those outside the labour force (3.4 per cent). For men, the corresponding estimates are 1.4 per cent for those in upper white-collar or blue-collar jobs, 1.6 per cent for those in lower white-collar jobs, and 2.0 per cent for those in elementary occupations. For men in the military, estimated prevalence is 4.6 per cent, while for those outside the labour force it is 2.9 per cent. Although the differences do not appear substantively large, they do indicate increased prevalence with lower occupational status. Moreover, the comparatively lower prevalence associated with blue-collar occupations, in relation to both lower white-collar and elementary occupations, highlights the significance of the institutionalization of occupations.

Sex differences by economic development are also apparent. For women in a country at a low level of development ($600 or 6 on the log scale), estimated prevalence of non-cohabiting marriage is 4 per cent. This decreases to 3.2 per cent when development is moderate ($3,000 or 8 on the log scale) or 3.4 per cent when economic development is high ($22,000 or 10 on the log scale). The gradient is much flatter and in the opposite direction for men. Here, estimated prevalence is 1.6 per cent where economic development is low and 1.9 per cent where it is high.

It is also valuable to consider the effects of our control variables. To start, there is significant life cycle variation in the risk of non-cohabiting marriage. For women, there is a slight curvilinear age pattern to prevalence. It is highest for those aged 18–34, with an estimated prevalence of 4.1 per cent. This declines marginally to 3.7 per cent for those aged 35–49, and again to 2.7 per cent for those aged 50–64. However, risk increases somewhat for the oldest age group, with an estimated prevalence of 3.5 per cent. The pattern is more linear for men: risk is

again highest for those in the youngest two age groups, with estimated probabilities of 2.6 per cent, but declines sequentially to 1.0 per cent for those aged 50–64 and to 0.5 per cent for those aged 65+. Evidence of educational stratification is weaker, with a 1.0 per cent difference between the lowest and highest categories, regardless of gender. The most striking effects seen involve those related to having children in the household. For women, the change from having no children to having one child reduces the prevalence of not cohabiting with a husband from 8.7 to 3.9 per cent. This falls to 2.3, 2.1, and 1.8 for two, three, and four or more children, respectively. Among men, estimated prevalence of not cohabiting with a spouse declines from 11.3 per cent when men have no children in the household to 1.4 per cent when they have one child, and is close to zero for two or more children. Importantly, this effectively eliminates the possibility of further contingencies by migration status, occupation, or development, although we did test for these.

We next turn to contingencies in the effects of economic development, migration, and occupation. BIC statistics indicate that the three-way models are significantly preferred to either the main effects or two-way models. For women, the BIC value for the main effects model in Table 2 is 115,307,860. This declines by 204,220 with the three-way model (Table 3). In the case of men, the BIC value for the main effects model is 82,289,178 and this declines by 421,630 with the three-way model. In comparison with models containing the full set of two-way interactions (not shown), the corresponding decreases are 7,544 for women and 7,267 for men. As Raftery (1995) has argued that a difference of −10 indicates 'extremely strong' support for the model with the lower value, our observed differences overwhelmingly point to the three-way specification as the preferred model. Parameter estimates for the three-way models are shown in Table 3, but we also calculate marginal effects with corresponding confidence intervals to show estimated prevalence of non-cohabiting marriage for migrants and natives in different occupations in countries at different levels of economic development; the corresponding estimates are shown separately for women and men in Figures 4–7.

Figure 4 shows occupational differentiation in the estimated prevalence of non-cohabiting marriage among natives, by level of economic development. Beginning with women (panel (a)), there are clear and pronounced declines with increasing development. For example, women in upper white-collar

Table 3 Logit coefficients: main and three-way conditional effects of labour mobility variables on probability of non-cohabiting marriage for females and males, with select controls

Variables	Females	Males
Occupation (Reference = upper white-collar)		
Lower white-collar	−0.344***	−0.571***
	(0.082)	(0.080)
Blue-collar	−1.187***	−1.208***
	(0.081)	(0.062)
Elementary occupations	−0.627***	−1.018***
	(0.105)	(0.092)
Armed forces	−1.448**	−0.595***
	(0.601)	(0.174)
Not in labour force	−1.487***	−0.500***
	(0.070)	(0.067)
Migrant	−2.534***	−1.398***
	(0.262)	(0.127)
Logged GDP per capita	−0.200***	−0.053***
	(0.017)	(0.020)
N-way interactions		
Migrant × lower white-collar	−0.258	−0.752***
	(0.348)	(0.200)
Migrant × blue-collar	1.420***	0.466***
	(0.299)	(0.151)
Migrant × elementary occupations	1.228***	−0.162
	(0.393)	(0.222)
Migrant × armed forces	1.560	3.542***
	(3.892)	(0.670)
Migrant × not in labour force	1.242***	−0.188
	(0.271)	(0.177)
Migrant × logged GDP per capita	0.326***	0.235***
	(0.027)	(0.014)
Logged GDP per capita × lower white-collar	0.045***	0.073***
	(0.009)	(0.010)
Logged GDP per capita × blue-collar	0.138***	0.128***
	(0.010)	(0.007)
Logged GDP per capita × elementary occupations	0.096***	0.143***
	(0.013)	(0.011)
Logged GDP per capita × armed forces	0.285***	0.210***
	(0.066)	(0.020)
Logged GDP per capita × not in labour force	0.159***	0.143***
	(0.008)	(0.008)
Migrant × logged GDP per capita × lower white-collar	0.039	0.130***
	(0.036)	(0.022)
Migrant × logged GDP per capita × blue-collar	−0.142***	0.031*
	(0.032)	(0.017)
Migrant × logged GDP per capita × elementary occupations	−0.107**	0.103***
	(0.042)	(0.025)
Migrant × logged GDP per capita × armed forces	−0.181	−0.411***
	(0.403)	(0.074)
Migrant × logged GDP per capita × not in labour force	−0.141***	0.004
	(0.028)	(0.019)
Constant	0.218*	−0.232*
	(0.124)	(0.138)
Control variables	Yes	Yes
Country fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
BIC	115,103,640.02	81,867,547.63
Observations	4,776,841	4,550,334

***p < 0.01; **p < 0.05; *p < 0.10.
Notes: Robust standard errors in parentheses.
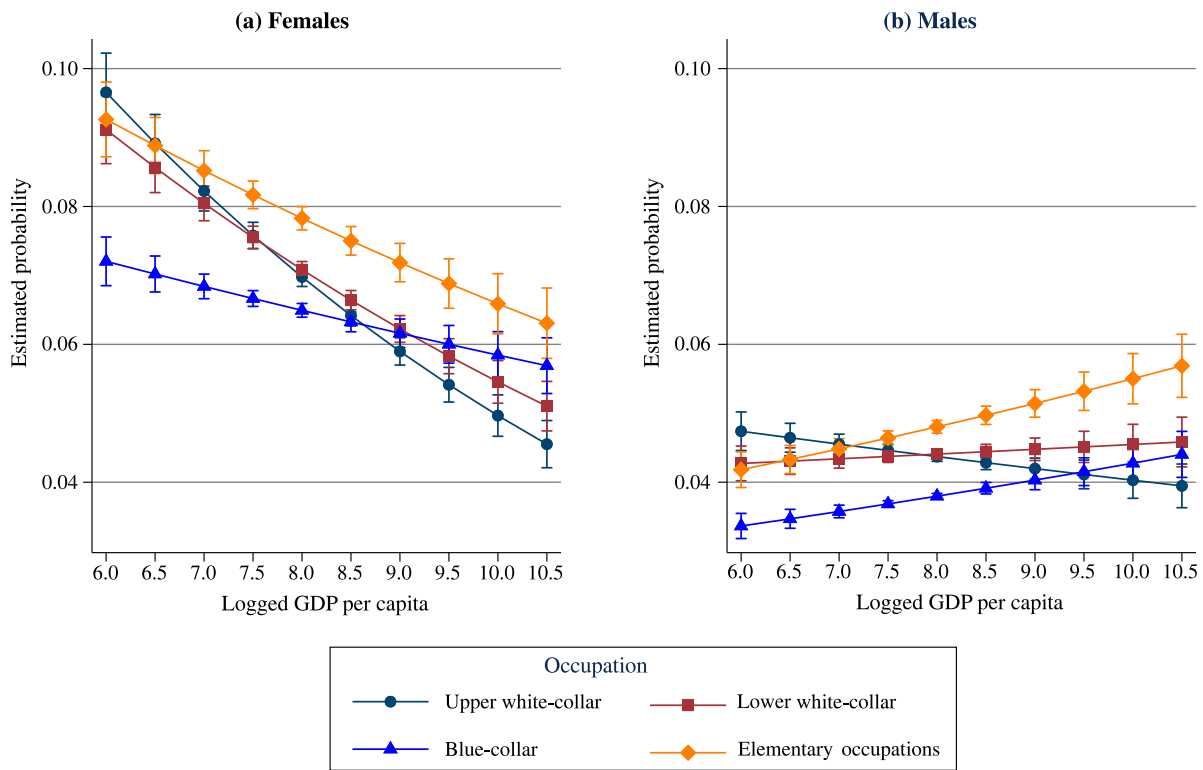*Source*: As for Figure 1.

Figure 4   Estimated probabilities of non-cohabiting marriage by occupational status and level of economic development: native women and men
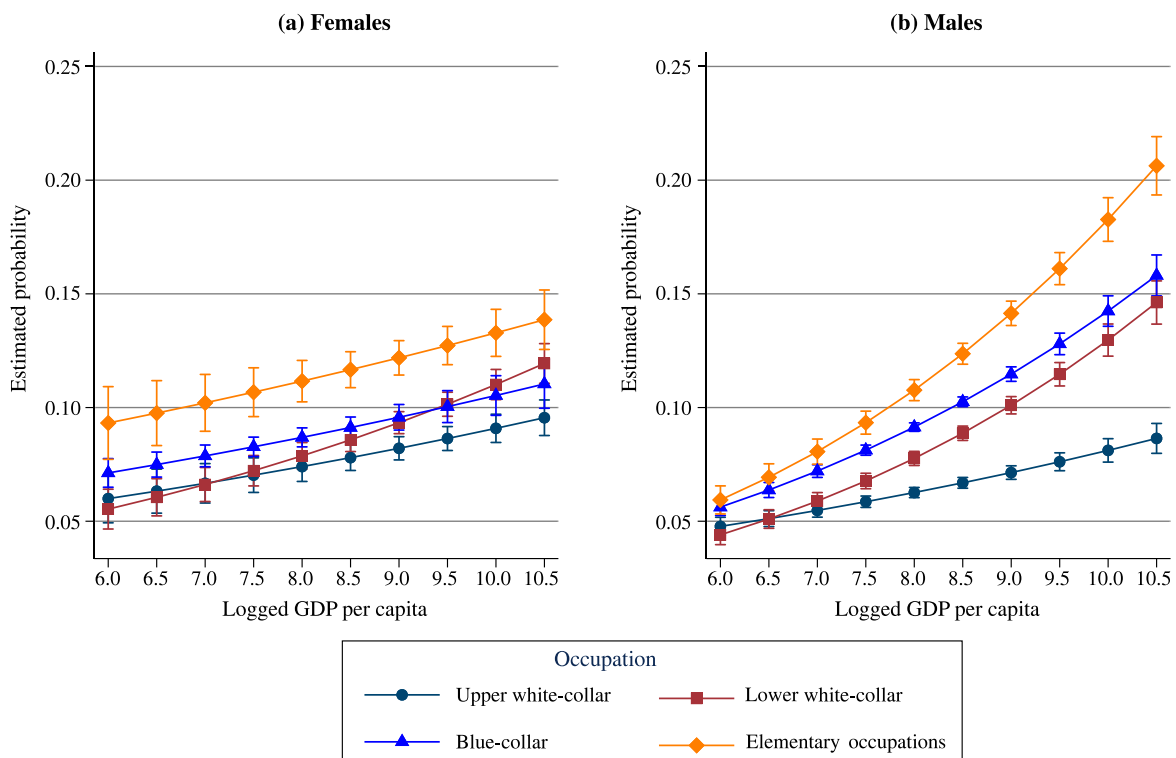*Source*: Authors' analysis of IPUMS–I data (*n* = 206 censuses for 70 countries over a period of 51 years).

Figure 5   Estimated probabilities of non-cohabiting marriage by occupational status and level of economic development: migrant women and men
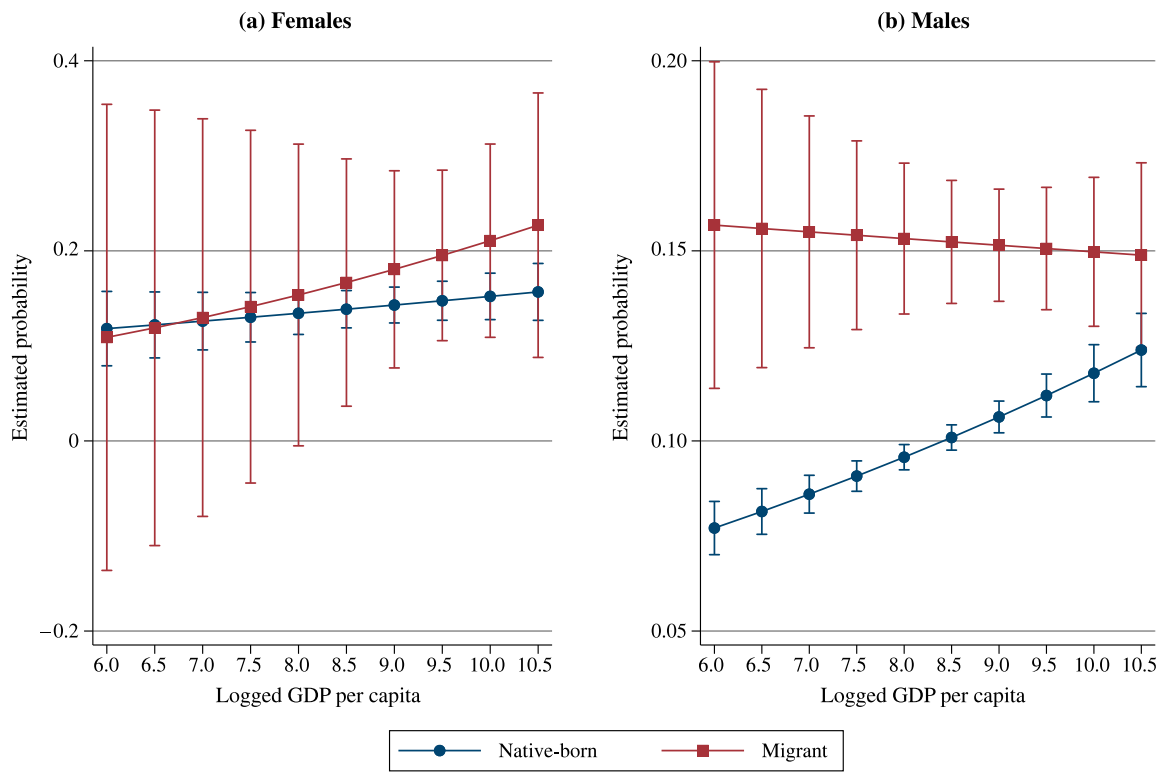*Source*: As for Figure 4.

Figure 6   Estimated probabilities of non-cohabiting marriage by level of economic development and migration status: women and men in the armed forces
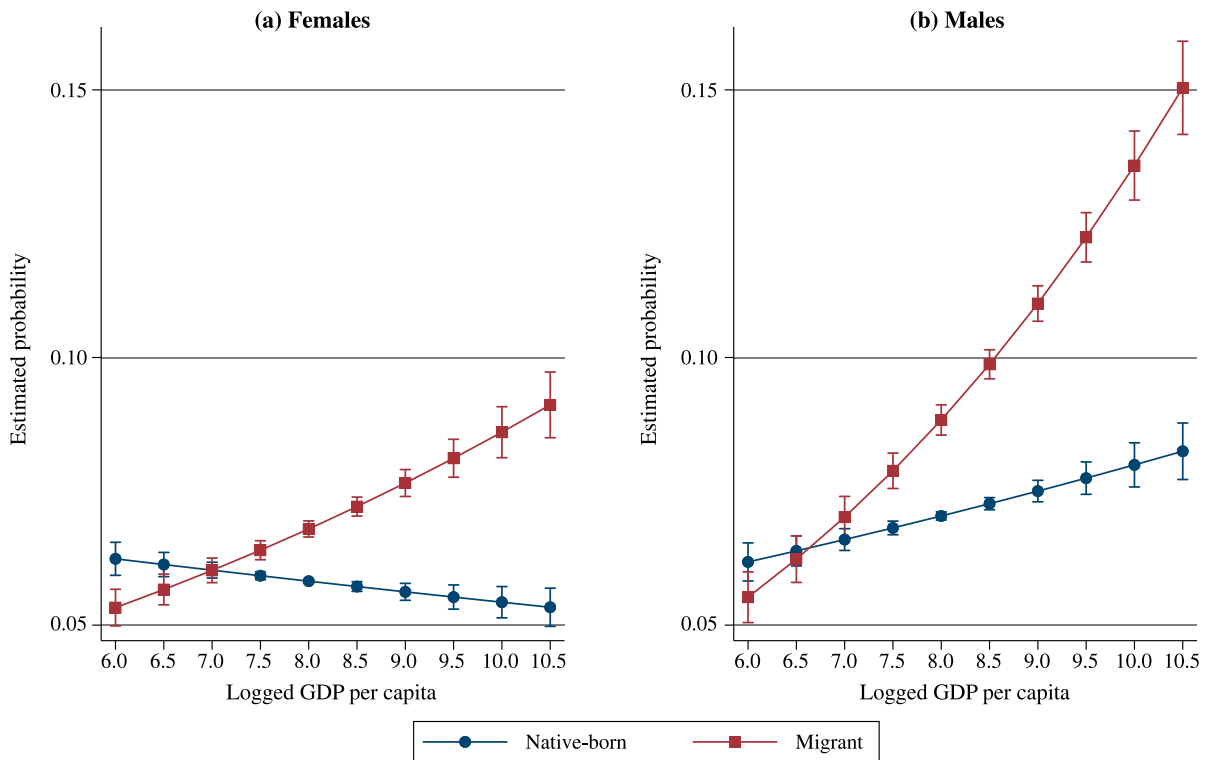*Source*: As for Figure 4.

Figure 7   Estimated probabilities of non-cohabiting marriage by level of economic development and migration status: women and men outside the labour force
Source: As for Figure 4.

occupations have an estimated prevalence of 9.5 per cent when economic development is low ($600 or 6 on the log scale) and this declines to 5.0 per cent when economic development is high ($22,000 or 10 on the log scale). Similarly, estimated prevalence declines from 9.0 to 5.5 per cent for women in lower white-collar jobs in low vs. high development contexts. At the same time, there is heterogeneity in developmental change. The developmental gradient is flattest for women in blue-collar occupations. For this group, estimated prevalence is 7.2 per cent in low development contexts and 5.8 per cent in high development contexts. Given this, the occupational stratification of non-cohabitating marriage appears to change with increasing development. In low development contexts, women in blue-collar occupations have the lowest prevalence (7.2 per cent), with little difference among the other occupational groups where estimated prevalence is around 9 per cent. In contrast, upper white-collar workers are most advantaged (i.e., less likely to live apart) in high development contexts (4.3 per cent), while those in elementary occupations are most disadvantaged (6.2 per cent).

The pattern for native men is quite different (panel (b)). For this group, overall prevalence of non-cohabitating marriage is much lower—typically between 4 and 6 per cent—and occupational differentiation is small to non-existent (i.e., many confidence intervals overlap). The only statistically significant differences are seen with respect to blue-collar workers in low development contexts ($600 or 6 on the log scale) and in high development contexts ($22,000 or 10 on the log scale) where those in elementary occupations have somewhat higher prevalence than other groups (5.8 per cent). The accumulation of disadvantage is seen if we compare risks for the most occupationally advantaged men in high development contexts with the most occupationally disadvantaged women in low development contexts. Here, the prevalence for the latter group is over twice that of the former.

Figure 5 repeats the exercise for migrants, and the development–occupation nexus works very differently for this group. For migrant women (panel (a)), occupational differentiation is fairly stable across the developmental continuum. For example, the difference in prevalence between those in upper white-collar occupations and those in elementary occupations is approximately 4 per cent (5.5 vs. 9.5 per cent when development is low and 14 vs. 10 per cent when development is high). A generic pattern of increasing prevalence with increasing economic development is notable. For all occupations, estimated prevalence is lower in low

development contexts and higher in high development contexts, with most of these differences being statistically significant.

For migrant men (panel (b)), the prevalence of non-cohabiting marriage also increases with greater development, but the magnitudes of the differences are much more pronounced. At low levels of economic development, estimated prevalence is low, at approximately 5 per cent, and there are no substantive differences across occupations. As economic development increases, estimated prevalence increases for all occupation groups, but does so in a highly heterogeneous way. For example, estimated prevalence for those in upper white-collar occupations increases from 5.0 to 8.5 per cent and is distinguishably lower than all other estimates by the middle of the distribution ($3,000 or 8 on the log scale). In contrast, estimated prevalence increases threefold for those in lower white-collar occupations, from 5.0 to 15.0 per cent. This is similar to the change in estimated prevalence for blue-collar occupations. Increases are most striking for migrant men in elementary occupations, where estimated prevalence increases more than four times, from 5.1 to 18.0 per cent, indicating that in high development countries nearly one in five migrant men in elementary occupations is in a non-cohabiting marriage.

As further comment, the comparative advantage of blue-collar occupations over similarly low-status elementary occupations is seen for both female and male migrants. For men, the gap in prevalence is consistently around 3 per cent, with married people in elementary occupations more likely to be non-cohabiting. For women, the prevalence gap increases with increasing economic development: when economic development is low the gap is essentially zero and not statistically significant, but this grows to around 5 per cent (15.5 vs. 20.5 per cent) when development is high. In general, occupational disadvantage in terms of non-cohabitation is exacerbated under higher development contexts, but this dynamic is more acute among men.

We next consider the more unique situations of working in the armed forces and being outside the labour force. Although statistical power is low, we provide relevant estimates for military work in Figure 6, and our analyses partially echo prior work showing elevated risk (e.g., Rindfuss and Stephen 1990). For native women (panel (a)), prevalence of non-cohabiting marriage is approximately 11 per cent and is largely stable across levels of economic development. Statistical power is very low for migrant women, yet estimated prevalence is 11 per cent at a low level of economic development and

increases with increasing economic development, to 21 per cent when economic development is at $22,000. For men, prevalence for the native born is slightly above the sample average: around 8 per cent at the lowest level of development and increasing with economic development. At high levels of development ($22,000), estimated prevalence is 12.5 per cent. For migrants, prevalence is higher and remains stable across the developmental continuum (at approximately 15 per cent).

For women outside the labour force (Figure 7), increasing economic development has contradictory implications for migrants and the native born (panel (a)). For the former, estimated prevalence almost doubles, from 5.1 to 9.0 per cent, when comparing contexts of low and high development. In contrast, prevalence decreases with development among native women, from 6.5 to 5.1 per cent. The pattern of risk is considerably different for men. In general, estimated prevalence increases with economic development, but the extent of this is highly variable. While the increases are small—from 6.0 to 7.6 per cent among natives—there are substantial increases in risk for migrant men, with prevalence increasing nearly threefold, from 5.1 per cent at low levels of development to 13.5 per cent at high levels of development.

Discussion

The intersection of marriage and cohabitation is a key issue in contemporary demographic research. Yet, while cohabitation without marriage has generated a deep, lively, and informative body of research, there has been comparatively less work on marriage without cohabitation. This is problematic on two fronts. First, there is a long legacy of research that has viewed marriage as a social good that yields personal, intergenerational, and collective benefits (Coleman 1988; House et al. 1988; Furstenberg and Hughes 1995). Yet discussion around the value of marriage almost universally assumes that cohabitation is providing the context by which resources can be shared, activities can be coordinated, and emotional exchange can occur. Second and related, there are good reasons why couples might not live together and hence clear value in identifying factors that either mitigate or exacerbate the risk of non-cohabiting marriage. In this vein, recent research, including work on the Second Demographic Transition, has sought to understand factors that increase the risk of non-cohabitation in intimate relationships (Anderson and Spruill 1993; Green et al. 1999;

Mulder and Hooimeijer 1999; Van der Klis and Mulder 2008; Van der Klis and Karsten 2009). Such work, however, has been largely qualitative, focusing on dual-career couples in advanced industrial economies. Missing from contemporary discussions is a broader, global accounting of socio-demographic and developmental risk factors. Our research focuses squarely on this issue through the lens of labour migration and economic development, via systematic analysis of high-quality census data for countries around the globe. There are several important findings.

First, the simple issue of variation in prevalence across countries should not be understated. If we assume that non-cohabiting marriage diminishes some of the positive aspects of marriage and introduces some negative ones, then it is useful to recognize the substantial variation that is apparent. In some countries, non-cohabiting marriage is extremely rare, while in others it is remarkably prevalent. This substantial heterogeneity raises questions about what, if any, modes of adaptation exist. Such questions are clearly worthy of future research.

Second, the issue of trends over time is also significant. While we might expect the global path of economic development to reduce the risk of non-cohabiting marriage, the overall pattern of change in the IPUMS–I data is upward—small, but upward. Moreover, a majority of countries where temporal analyses are possible show increasing risks in recent decades; this includes a number of advanced industrial economies that should see risks mitigated by high GDP per capita. This may indicate a qualitative shift, where the effects of economic development have different implications for the risk of non-cohabiting marriage in the current era, a potentially unacknowledged aspect of the Second Demographic Transition. At the same time, the interactions between micro- and macro-level factors shed some light on this contradiction by showing that individual-level risk factors, such as low occupational status, can be exacerbated with greater economic development. In the end, the complex interplay of occupational differentiation, migration, economic development, and cultural change—factors that are hallmarks of modern globalization—produces complex trends over time.

As a first step in organizing the social dynamics shaping non-cohabiting marriage, this paper focuses on the dynamics of labour migration. These include migration and occupational status at the individual level and economic development at the macro level. These factors have both independent and contingent effects on risk, and provide a focus on a

number of salient issues. In terms of 'main' effects, the increased risk of non-cohabiting marriage tracks social disadvantage in a number of ways. At a basic level, risk is elevated for the young, the less educated, those in lower-status jobs, and migrants. Risk is also higher in less developed countries, but only for women. Moreover, the magnitude of these effects is consistently larger among women. In general, social disadvantage is uniformly associated with elevated risk and the risk is magnified with accumulating disadvantage.

It is important to recognize the implications of the differences that we observe, given the global scope of our data. Consider, for example, the small advantages (0.8 and 2.0 per cent, respectively) that native-born men and women in blue-collar occupations have over their contemporaries in lower white-collar and elementary occupations in low GDP per capita contexts ($600 or 6 on the log scale). According to the United Nations (UN) classification, there are over 1 billion people living in the 'least developed' countries that correspond to the low GDP per capita countries in our data. Based on the distribution of the sample across occupations, and using the prevalence of non-cohabiting marriage among elementary occupations as a counterfactual, this translates into an estimated 3.7 million married couples who cohabit rather than not, due to the small advantage associated with blue-collar occupations. Similarly, the 10 per cent greater prevalence of migrant men in elementary occupations relative to those in upper white-collar jobs in high development contexts ($22,000 or 10 on the log scale) translates into an estimated increase of 2.7 million households where wives and husbands do not cohabit. It is important to recognize that differences that may appear small often have implications for hundreds of thousands, if not millions, of families.

Yet when we further consider the various contingencies that we highlight, the evidence of cumulative disadvantage becomes even more salient. For upper white-collar, native men in high development contexts, the risk of non-cohabiting marriage is low. Here, prevalence is estimated at 4 per cent, indicating that approximately 1 in 25 marriages would not involve cohabitation. At the other end of the spectrum, migrant men in elementary occupations in a high development context have a corresponding prevalence of 20 per cent, so one in five marriages would not involve cohabitation. If we regard these as typical 'advantaged' and 'disadvantaged' life circumstances, risk is five times greater with multifaceted disadvantage. By this metric, the compounding risk of non-cohabitating

marriage associated with cumulative disadvantage is extreme.

Our work also highlights contradictions in economic development and the broader project of modernity that are masked by simple analyses. Our simple scatterplot (Figure 2) shows a fairly strong negative relationship between the prevalence of non-cohabiting marriage and economic development. But most of this is driven by countries' time-stable attributes. In a simple bivariate model (not shown), the effect of logged GDP per capita on the odds of non-cohabiting marriage is -0.311 ($OR = 0.733$, $z = 286.48$). With country and time fixed effects included, the same effect on odds is one-tenth the size, -0.032 ($OR = 0.969$, $z = 3.54$). Moreover, this small negative effect reflects contradictory dynamics that combine a generic negative association for native-born women, a null association for native-born men, and robustly positive associations for migrant women and men (shown in Figures 4 and 5). Contrary to the general trend, in some cases economic development increases the risk of non-cohabiting marriage and exacerbates occupational stratification considerably. We are certainly not the first researchers to introduce the native–migrant distinction in family formation and family structure, but our research links these to work and occupation, and to developmental context—novel dimensions that are worthy of further study.

Still, there are limitations. Our work is notably silent on issues of culture. On the one hand, cultural explanations have been critical to contemporary work within the Second Demographic Transition tradition, and changing norms and values around family and its relationship to paid work have been central to theoretical accounts of new family forms. Yet, existing explanations, particularly those that stress the emergence of higher-order values (e.g., Surkyn and Lesthaeghe 2004), seem limited in explaining the broad cross-national differences we observe. While we can only speculate, cultural norms supportive of polygamy appear to be a salient issue. Of the 15 countries with the highest prevalence of non-cohabiting marriage, twelve are countries where polygamy is legal, illegal but still practised, or allowable under customary law. Investigation of such issues is beyond the scope of this paper and may call into question the global reliability, if not the meaning, of the concept of marriage. Still, we see value in a broader cultural inquiry into norms and values that may influence non-cohabiting marriage.

In the end, the dynamics that we highlight only scratch the surface of what may limit wives and husbands from living together. Our work is deliberately

parsimonious in focusing on labour mobility. There is no reason to view this as the only vector of influence and we hope our work provides a motivation for further inquiry. In this spirit, earlier studies of cohabitation have been extended with important research that sought to understand both attitudinal and cultural underpinnings (e.g., do cohabitees view their relationships differently from those who are married? How acceptable or normative is it to cohabit? Are cohabiting unions seen as lesser relationships?), as well as research that sought to understand its personal consequences (e.g., are risks of mental distress higher in cohabiting relationships? Do cohabitees experience a greater risk of dissolution?) and social consequences (e.g., do children raised in cohabiting households experience poorer developmental outcomes?). We see similar opportunities with respect to non-cohabiting marriage. Indeed, non-cohabiting marriages are unique in that they retain a key link to strong and pervasive marriage norms (Thornton and Young-DeMarco 2001), yet lack mechanisms that allow for direct interpersonal exchange on a daily basis. Hence, both non-marital cohabitation and cohabiting marriage provide useful comparison groups on a number of levels.

As a final observation, work under the rubric of the Second Demographic Transition has at its core the empirical reality that processes of family and fertility are increasingly disjointed. Couples increasingly cohabit rather than marry; those who marry have a high likelihood of divorce; couples 'live apart together'; and couples have fewer children and increasingly have them outside traditional marital unions. We see non-cohabiting marriage as easily falling within such conceptual boundaries. The upward trend over time—a trend seen in advanced economies such as France, Germany, Spain, Switzerland, and the US—is certainly consistent with theoretical expectations. At the same time, the social dynamics that we identify deviate from those that characterize the typical framework of relationships under the Second Demographic Transition. Such a disconnect suggests the need for further research that seeks to disentangle the ideological drivers central to Second Demographic Transition work from those that are more socio-structural and connected to economic globalization. Continued study of the consequences of development, modernization, globalization, and the heterogeneity and (increasing) diversity of modern families is vital for understanding the socio-demographic trends of contemporary society and their important consequences for personal and social well-being.

Note

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