Socioeconomic status and net fertility during the fertility decline: a multilevel-comparative study on historical populations

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Abstract: Recently there has been a renewed interest in the socioeconomic aspects of reproduction during the first demographic transition. While most previous work on historical fertility decline has been macro-oriented, using aggregate data to examine economic correlates of demographic behavior at regional or national levels, much less has been done using micro data, and specifically looking at behavioral differentials among social groups. In this paper we look at the impact of socioeconomic status on net fertility (surviving children) during the fertility transition in five Northern American and European Countries (Canada, Iceland, Norway, Sweden and the USA). Micro-level census data covering the entire population in 1900 will be used. The data contain information on number of children by age, occupation of the mother and father, place of residence and household context. Coding occupations in HISCO and classifying them into a social class scheme (HISCLASS) enables us to study the impact of socioeconomic status on number of children under 5, controlling for spatial variations in social stratification.

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Introduction

For most of the twentieth century, demographers agreed that fertility behavior and change were strongly influenced by socioeconomic status and economic development. The secular decline of fertility, which commenced in Northwestern Europe and North America in the late nineteenth century, was assumed to be causally linked to changes in occupational structure associated with industrialization and urbanization, from predominately agricultural occupations prior to the decline to increasingly professional, industrial, and other non-agricultural occupations during the transition. Fertility and socioeconomic status were positively correlated in the early modern era (e.g., Clark 2007, Clark and Cummins 2009; Boberg-Fazlic et al. 2011; Schneider and Schneider 1996); the correlation reversed shortly before or during the fertility transition, with professional and middle class families on the vanguard of behavioral change and agricultural families lagging (Livi-Bacci 1986; Haines 1992; Skirbekk 2008). Social and economic class differentials in fertility widened in the first few decades of the transition, reflecting rapidly changing differentials in knowledge, access to information, economic aspirations, returns to education, and the cost of raising children. Sub-replacement fertility among college educated and upper class women and high fertility among lower class women alarmed progressive era reformers and social scientists, fueling eugenic rhetoric on both sides of the Atlantic (Kevles 1985; Szreter 1996). Early twentieth-century demographers lobbied to have fertility questions added to national censuses to study the phenomenon, and studies of fertility focused on group differentials (e.g., see the 1913 Registrar General report on class differentials in the 1911 fertility census of England and Wales, Notestein [1931] on class differentials in the United States, and Himes [1936] on the "democratization of birth control" from upper to lower class groups).

Class differentials narrowed near the end of the transition, however, as all groups eventually achieved small family size. Research in the last quarter of the twentieth century has de-emphasized the importance of socioeconomic status and economic development in fertility decline. The findings of the European Fertility Project (EFP), which analyzed aggregate fertility data in more than 700 European provinces, famously found only weak or insignificant correlations between the onset of marital fertility decline and various measures of economic development, including measures of the agricultural labor force, education, industrialization, urbanization, and infant mortality (Knodel and van de Walle 1979; Coale and Watkins 1986). The World Fertility Survey project, which examined correlates of fertility behavior in dozens of developing countries in the 1970s and 1980s, also downplayed the importance of socioeconomic factors (Cleland et al. 1985). Both projects stressed the importance of ideational factors and directed subsequent research toward the study of culture and ideas. Simon Szreter (1996) has argued that the "professional model," employed by early analyst of the 1911 fertility census in Great Britain, seriously distorts our understanding of the fertility transition by putting too much emphasis on social class and too little on spatially-located "communication communities" with unique fertility behaviors and trends.

Recently there has been a renewed interest in the socioeconomic aspects of reproduction. Critics have shown that the aggregate data and measures used by the EFP were inadequate for dating the onset of the transition (Guinnane, Okun and Trussell 1994) and for testing hypotheses (Brown and Guinnane 2007). Using less aggregated data and more sophisticated analyses, studies of the fertility transition in Germany by Galloway, Hammel, and Lee (1994) and Brown and Guinnane (2002) have found a significant role for economic factors downplayed in the EFP. In his study of the Swedish fertility transition, Dribe (2009) emphasizes the importance of traditional supply and demand variables—education, income, mortality, urbanization and relative female wages. Most recently, Barnes and Guinnane (2012) have reexamined Szreter's evidence from the 1911 census of England and Wales using analysis of variance techniques and found that two-thirds of all variation in marital fertility across couples was explained by variation between social classes. They caution, however, that more research is needed, especially research based on individual-level micro data with adequate geographic controls to account for causal forces at the community.

In this paper we rely on preliminary micro data collected by the North Atlantic Population Project (NAPP) to evaluate socioeconomic differentials in fertility among five national populations (Canada, Iceland, Norway, Sweden, and the United States) circa 1895-1900, a period near the early to middle part of their respective fertility transitions. The NAPP data are high-density census micro data samples collected for each nation. Harmonized sample designs, consistently-constructed variables, and uniform variable coding greatly facilitate the analysis and ensure non-biased comparisons. The high density in most samples makes it possible to look at the socioeconomic pattern in considerable detail while controlling for spatial heterogeneity. Among the questions we consider: Was the pattern of social class differentials in fertility similar across national populations? To what extent were fertility differences among socioeconomic groups related to spatial differences in socioeconomic structure in national populations (Garrett et al. 2001, Szreter 1996)? What do class differentials in fertility and comparisons across national populations reveal about fertility decline?

Theoretical background

In a classic article the Swedish sociologist Gösta Carlsson (1966) made the distinction between innovation and adjustment as the main determinants of fertility decline. Even though this framework has later been extended and refined in various ways (e.g. the supply-demand framework by Easterlin and Crimmins (1985) or the Ready-Willing-Able model by Coale (1973, see also Lesthaeghe and Vanderhoeft 2001) the basic distinction between innovation-based and adjustment-based explanations has survived.

By adjustment we mean factors promoting families to change their behavior following new conditions for childbearing and family life. The demand for children can be defined as the number of children a couple would want if there were no costs to limit fertility (Easterlin and Crimmins 1985). It depends on family income and the costs of children in relation to other goods. Children are assumed to be normal goods, implying that a higher income increases fertility while a higher relative price of children lowers it. The demand for children is also dependent on the preferences of consuming other goods, and a higher demand for consumption of other goods lowers the demand for children. In addition, the demand for child quality is often believed to have increased as a result of economic changes following industrialization and urbanization, through which education and other investments in children have become ever more important (Becker 1991). Thus, demand for child quality has increased at the expense of child quantity, which helps to explain why fertility does not increase together with rising incomes in the process of modern economic growth. Instead, the decline in fertility has been seen as a crucial part, and sometimes even a root cause, of modern economic growth (Galor 2005; see also Becker, Cinnirella and Woessmann 2010).

The supply of children is defined as the number of surviving children a couple would get if they made no conscious efforts to limit the size of the family (Easterlin and Crimmins 1985). Thus, it reflects natural fertility as well as child survival. High child mortality constitutes a limit on this potential supply and cultural factors outside the immediate control of the family, such as breastfeeding practices, which influences the level of natural fertility, might also impose such a limit. Declining mortality in the first phase of the demographic transition changed the supply of children, and this was one important factor for the fertility decline (e.g. Galloway, Lee and Hammel 1998; Reher 1999; Reher and Sanz-Gimeno 2007; see also Dyson 2010). However, the magnitude of the mortality decline was much smaller than the decline of fertility, implying that mortality could only have been one of several important determinants of fertility decline (cf. Haines 1998). As stressed by Doepke (2005) also net fertility (number of surviving children) declined in this period and this decline was largely unrelated to mortality. Moreover, there was often a long time lag between the start of the mortality and fertility declines, sometimes 100 years, which makes it even more unlikely that mortality decline was a sufficient cause of fertility decline.

Taken together, the economic, demographic and social changes following the agricultural revolution, industrialization and urbanization of the nineteenth century created new conditions for both working life and family life. These changes included, for instance, the expansion of wage labor outside the home, increasing importance of education, higher proportions of people living and working in cities, less use of children in household production, and better child survival, which in turn led families to adjust their target family size.

At the same time the dominating view in historical demography since the days of the European Fertility Project has been that fertility in pre-transitional Europe was not deliberately controlled but 'natural'. In fact, fertility was not considered to have been within "the calculus of conscious choice" (Coale 1973:65), and the main explanation behind the fertility transition was the innovation of families to adjust fertility within marriage to economic circumstances (e.g. Coale and Watkins 1986). As a consequence, females stopped child-bearing after having reached a certain target family size; in other words, the control was parity-specific. According to this view fertility decline was not so much a response to changing economic and demographic conditions as to the diffusion of new ideas and attitudes about birth control, to a large extent related to broader value changes, secularization, etc. that came about in the period of modernization (e.g. Lesthaeghe 1977; Lesthaeghe and Vanderhoeft 2001; Cleland and Wilson 1985). In the model of Easterlin and Crimmins (1985) these kinds of changes affects the costs of fertility regulation, which can be defined as the direct monetary costs as well as psychic costs of regulating fertility. New, more positive, attitudes towards fertility control among broader segments of the population will act to lower these costs. In a similar way easy access to modern contraceptive methods will affect these costs.

In this way fertility decline can be seen as a result of both adjustment of behavior to new socioeconomic circumstances and innovation in the form of new attitudes and methods lowering the costs of fertility control. We expect different social groups to have been differently affected by both innovation and adjustment. On the one hand we expect middle and upper classes to have been affected first by changes in adjustment because they held more skilled occupations where returns to education should have increased first, and thus the quantity-quality trade off should have kicked in earlier. On the other hand we also believe that cultural change affecting attitudes, secularization, etc. originated in the upper and middle classes and then gradually diffused to lower segments of society (Shorter 1977; Frykman and Löfgren 1987; Van de Putte 2007). Thus both explanations point to similar socioeconomic patterns in the decline, namely that the higher socioeconomic groups should experience an earlier fertility decline regardless of context. However, given that this is the pattern observed it is difficult to discriminate between the two explanations, in other words if the predicted socioeconomic differences are explained by innovation or adjustment. In the empirical analysis below we investigate the gross socioeconomic differentials in the fertility decline in the various contexts studied and add proxies for adjustment and innovation to see how much of the differentials that are captured by these variables, to get some idea of the remaining difference. Even though this does not give us the full explanation it will contribute to a more solid empirical understanding of the socioeconomic patterns of the fertility transition.

Data

We use data from the North Atlantic Population Project (NAPP), which adopts the same format as the Integrated Public Use Microdata Series (IPUMS) [1]. The NAPP and IPUMS International projects have focused their efforts on increasing the comparability of census microdata. Despite the wide variety of countries and censuses, demographic and socioeconomic variables have been harmonized and uniformly coded.

[1] It is possible to find full information, complete documentation and data at the NAPP website: http://www.nappdata.org/napp/index.shtml

The NAPP data have been described in detail elsewhere (Ruggles et al. 2011). Most scholarly attention has been focused on the complete censuses in the collection: the 1881 census of Canada, the 1881 census of England and Wales, the 1703, 1801, 1880, 1901 censuses of Iceland, the 1865 and 1900 censuses of Norway, the 1881 census of Scotland, the 1900 census of Sweden, and the 1880 census of the United States. These databases include individual-level information for every person enumerated by the census, and thus allow analysis of small areas, small groups, and linkages to other censuses. A number of high-density samples are also available, however, such as the 1901 Canadian census (5+% sample density) and the 1900 United States census (5+% sample density). These samples have sufficient cases to control for unobserved heterogeneity in small geographic units such as counties, municipalities and parishes.

We limit our investigation to an analysis of recent net fertility (the number of own children less than five years old living in the household) among currently married women of age 15-54 in the 1901 census of Canada, 1901 census of Iceland, 1900 census of Norway, 1900 census Sweden, and the 1900 census of the United States. These census databases provide a large set of geographical, demographic and socio-economic variables. In some cases, only a sample of the census is included, in other cases all the registered individuals are included (see Table 1). Although the complete count databases for these and other countries are available in the NAPP circa 1880, marital fertility had only recently commenced to decline in one of these countries (the United States) by that date (Hacker 2003), and thus social class differences in marital fertility were likely small relative to class differentials in infant and child mortality. As discussed in more below, most censuses included in the NAPP reported only living children. Fertility analyses must therefore rely on measures of net marital fertility (the number of children born to married women less the number dying prior to the census). In addition to making a theoretical argument that net fertility is in some ways a preferable measure of fertility behavior, we argue that social class differentials in marital fertility were large enough circa 1900 to be robust to probable class differentials in infant and childhood mortality.

The great advantage of census data is the coverage and the possibility of studying fertility differentials by socioeconomic status across space. However, a challenge to comparative analysis is that areas within countries are not consistently measured and vary by geographic size and the number of observations. In Sweden, Norway and Iceland, we were able to rely on a variable identifying parish, whereas in Canada we used district, which was extracted from the dwelling number. In the United States, the smallest geographic unit consistently measured was the county (see Table 1). Using these geographic units we calculate community-level socioeconomic indicators, for example rates of industrialization, education or migration.

Table 1 here

All registered individuals are grouped by household. In this way, each individual record reports the household index number and the person index within the household. The age, marital status and sex of each person are also registered. Migration status indicates if a person was born in the same state, county or province of residence or elsewhere. A person's relationship to the household head is also recorded. In addition, there are family pointer variables indicating the personal number within the household of the mother, father, or spouse, making it possible to link each woman to her own children and husband.

The dataset also offer quite detailed information on occupation, allowing classification into a fairly large number of social groups using the HISCO and HISCLASS scheme (Van Leeuwen and Maas 2011). As a work in progress, however, the NAPP has several limitations. The main disadvantage with the NAPP census data used in this analysis is that a consistent classification scheme for class has yet to be fully implemented for all censuses.

Our intention was to rely on husband's occupation to identify couples' socioeconomic status according to the Historical International Standard Classification of Occupations (HISCO) classification system, and from that, to identify which of 12 different historical classes each couple belonged to using the HISCLASS system, an international classification scheme based on skill level, degree of supervision, whether manual or non-manual, and whether residence was in an urban or rural area (Van Leeuwen, Maas and Miles 2002). The classification system contains the following classes: 1) Higher managers; 2) Higher professionals; 3) Lower managers; 4) Lower professionals, and clerical and sales personnel; 5) Lower clerical and sales personnel; 6) Foremen; 7) Medium skilled workers; 8) Farmers and fishermen; 9) Lower skilled workers; 10) Lower skilled farm workers; 11) Unskilled workers; and 12) Unskilled farm workers.

Construction of a consistent occupation variable was the most difficult task in the development of the NAPP database (Roberts et al. 2002). Individuals' tasks, industry, and class of worker were not consistently recorded across censuses or even within censuses. For the earliest releases of the NAPP datasets, the project staff was forced to rely on a modified version of the HISCO system. Although similar, the "NAPP-HISCO" classification scheme has only about 650 unique codes to HISCO's 1,881 codes. A few new codes were created that are unique to NAPP-HISCO. And while some of the census samples in the NAPP include HISCO and HISCLASS variables, some, such as Canada in 1901, include only the NAPP-HISCO variable. In these cases we relied on existing samples from Sweden that included both the HISCO, NAPP-HISCO, and HISCLASS variables, and a translation table[2] to construct a HISCLASS variable. Although we believe any inconsistencies and errors from this procedure are minor, we prefer a more aggregated classification scheme based on only 6 groups: Elite (HISCLASS 1-6), Skilled workers (HC 7), Farmers (HC 8), Lower skilled workers (HC 9-10), Unskilled workers (HC 11-12). The NAPP data also provide information on labor force participation, that is a derived dichotomous variable identifying whether a person aged 15 and above reports any gainful occupation.

By necessity, our analysis relies on the number of own children currently living in the household as the dependent variable rather than the number of children ever born. It is therefore an analysis of net marital fertility, or reproduction, rather than an analysis of marital fertility. However, as the fertility transition clearly was a decline not only in marital fertility but also in number of children surviving, our focus on net fertility also makes substantive sense. To ensure that we model recent net marital fertility, we rely on own children less than age 5 and limit the sample to currently married women with spouses present.

We suspect that results of an analysis of marital fertility, if available, would be very similar to our analysis of net marital fertility. A preliminary comparison of net fertility (child-woman ratios) and marital fertility by Dribe and Scalone (2011) for Malmöhus county in Sweden 1896-1900 indicates very similar results by social class. Although unadjusted child-woman ratios were underestimated for high mortality groups in relation to low mortality groups, the relative positions of the different socioeconomic groups were the same for the adjusted and unadjusted child-woman ratios. The NAPP sample for the 1900 United States census, which included questions for children ever born, children surviving, and children living in the household, provides an additional opportunity to compare marital fertility and net marital fertility. Figure 1 compares marital fertility and net marital fertility estimates of four major socioeconomic groups—unskilled workers, lower skilled workers, skilled workers and elite (professionals, managers, and proprietors)—relative to that of farmers, the group with the highest marital fertility rates, and lowest infant and child mortality rates, and, consequently, highest net marital fertility

[2] A conversion tool for between NAPP-HISCO and HISCO can be found at: https://dames.cs.stir.ac.uk/

rates. Because all groups suffered higher rates of infant and child mortality rates than farmers, differentials in net fertility between farmers and non-farmers are larger than differentials in marital fertility. The difference is especially noticeable for the group with the highest infant and child mortality rates, unskilled workers. Unskilled workers had marital fertility rates 95 percent of that of farmers, but net fertility rates only 85 percent as large. Overall, however, the rank order of groups was unchanged, with the elite group having both the lowest marital fertility and net marital fertility rates and farmers the highest.

Figure 1 here

Even assuming some modest bias from group differentials and infant and child mortality, we contend that there are theoretical reasons to prefer analysis of net fertility to marital fertility. A large literature finds a significant relationship between infant and childhood mortality, marital fertility, and fertility decline. In most nations, a higher supply of children caused by mortality decline was likely an important factor in triggering marital fertility decline (Easterlin and Crimmins 1985, Mason 1997), although the United States may have been an exception to this generalization (Haines 2000). Parents practicing significant marital fertility control make decisions to continue, accelerate, postpone, or cease childbearing based on the size and composition of their surviving children, not the size and composition of their children ever born. An infant death among couples not practicing marital fertility control, on the other hand, will interrupt breastfeeding, shortening the postpartum infecundability period, accelerating the next birth, and magnifying group differentials. Thus, behavioral models likely benefit from estimation of net fertility, not gross fertility.

Methods

We estimate the same set of models for all countries Ordinary least squares regression (OLS) models for all countries have been estimated to assess the association between socioeconomic status and the number of children under 5 for each married woman aged 15-54. We also estimate fixed effects regressions (FE) to control for unobserved heterogeneity at the lowest available geographical level.

The OLS model is formulated as:

(1) $$Y_{ij} = a + \sum_{k=1}^{K} \beta_k SES_{k,ij} + \sum_{l=1}^{L} \beta_l X_{l,ij} + \sum_{m=1}^{M} \beta_m Z_{m,j} + \varepsilon_{ij}$$

where the dependent variable Y_{ij} is the number of own children under 5 of a married women i that lives in community j. SES represents a categorical variable for socio-economic status, X is a sets of dummy covariates for each individual characteristics (age, age differences between spouses, migrant status and female work). Z is a set of categorical community level indicators (education, female labor force participation, migrants and proportion of agricultural workers) related to the geographical unit j. The Z categorical covariates include three categories: "low" for values equal or less than the first quartile, "middle" for values between the first and the third quartiles, "high" for levels higher than the third one.

The FE model can be written as:

(2) $$Y_{ij} = a + \sum_{k=1}^{K} \beta_k SES_{k,ij} + \sum_{l=1}^{L} \beta_l X_{l,ij} + \upsilon_j + \varepsilon_{ij}$$

where υ_j is the community-specific residual and ε_{ij} is the individual woman's residual.

The fixed-effects specification implies that the group-specific heterogeneity is assumed to be constant, and thus controls for invariant differences between groups (at the lowest available geographical level) that are not captured in the previous OLS model.

We start with a basic model (M1) containing only socioeconomic status and age of the woman. This provides a picture of the crude differences in net marital fertility across socioeconomic groups. Next (M2) we extend the model by including age difference between spouses, presence of children over 4, and household status. In M3 we include a set of variables capturing adjustment factors: wife's employment status, community level female labor force participation, teachers/school children and proportion employed in agriculture. They serve as reasonable proxies at the community level for the importance of education, women's labor market attachment and degree of industrialization. In M4 we instead look at innovation factors: individual migrant status, community level proportion of migrants and child-woman ratio. Migration variables serves to measure the degree of connection to the surrounding society and thus potential for the spread of information and new ideas. The community level child-woman ratio is intended as a measure of the fertility culture in the community, but it is of course difficult to isolate this effect from an effect of previous changes in the adjustment variables. M5 is the full model including both innovation and adjustment variables. Admittedly, the variables included do not cover all aspects of innovation and adjustment, or of the supply and demand for children, as discussed above. Finally we estimate a fixed effects model (M6), which is the most powerful in terms of controlling of community level unobserved heterogeneity. Comparing the basic model (M1) and the fixed effects models (M6) provides an idea of how much of the gross differences between socioeconomic groups that can be accounted for by geographical differences not related to individual socioeconomic status per se.

Table 2 presents the means and distributions of all variables in the analysis. It reveals considerable differences across countries in social structure. The share of the elite group ranges from about 11 percent in Iceland to almost 20 percent in the United States, while the share of unskilled goes from around 10 percent in Iceland and Norway to over 20 percent in Sweden.

Table 2 here

As already mentioned, the employment status of married women is not straightforward to measure because of the problem of farming. To include all wives in the farming sector as employed would give much higher estimates than the ones presented here, where we have only included occupations noted in the sources (i.e. not wife). For example in the case of Sweden only 0.6 percent of all married women in the age group 15-54 were gainfully employed outside the farm. According to the census of 1920 the corresponding figure was 4 percent (Silenstam 1970:56). Excluding farm women also from the denominator naturally increases the figures.

The distributions in Table 1 shows big differences in proportion of married women employed in the different countries from 0.5 percent in Sweden to 12 percent in Iceland. It is difficult to assess the extent to which these differences reflect real differences in labor force participation among married women or the accuracy in reporting occupations.

Age difference between spouses also shows some interesting differences between populations. Wife-older heterogamy was more common in the Nordic countries (about 25 percent) than in North America (12-14 percent), while husband older heterogamy was more common in North America. The importance of migration also seems to differ quite a bit but it is important to remember that the geographical units on which this variable is based vary considerably in size. Mean number of children below 5, which is our measure of net marital fertility, vary between 0.7 in the United States and 0.9 in Iceland and Norway, with Sweden and Canada in between (0.8). Also in terms of community level characteristics there is quite a bit of variation between the countries.

Results

We begin by discussing the socioeconomic differences. The basic model (M1, Table 3) shows quite large fertility differentials across socioeconomic groups. Except in Iceland the elite group stands out with low net fertility. In the United States and Canada farmers have the highest net fertility while this is somewhat less marked in the Nordic countries. Looking at the magnitudes of the coefficients, farmers in Sweden have about 0.2 more children under 5 than the elite, which should be related to the average number of children under 5 which is 0.8. This indicates that socioeconomic differences are of a considerable magnitude in this basic model. This is also evident from Figure 2a, which shows predicted child-woman ratios in Sweden from the OLS estimates. In peak childbearing ages (20-29) net fertility for farmers is about 15 percent higher than for the elite. Norway and Iceland show similar magnitude for farmers, and in the United States and Canada coefficients are even larger, 0.36 and 0.29. Figure 5 shows that in Canada net fertility in ages 20-29 is about 40 percent higher for farmers than for the elite, and in the United States the corresponding figure is even higher, around 50 percent (see figure 6a).

Table 3 and Figures 2-6 here

If we instead look at the workers, unskilled workers have between 0.13 and 0.20 more children under 5 in Sweden, the United States and Canada, while they have lower net fertility than the elite group in Iceland and about the same as the elite group in Norway. Semi-skilled workers have 0.12-0.17 higher child-woman ratio than the elite group, except in Iceland. In other words the socioeconomic patterns differ somewhat between the countries although the elite group appears as a group with low net fertility and farmers a group with high net fertility.

The estimates in M1 reflect the gross differences at the national level only controlling for the age of the woman. Adding the control variables generally reduce the socioeconomic differentials. Comparing the basic model with the fixed effects full model (M6) shows that a considerable part of the gross differences can be explained by geographical heterogeneity and individual characteristics not immediately connected to socioeconomic status. This is particularly clear for Sweden and Norway as is evident when comparing a and b in figures 2-6. Nonetheless the basic pattern remains more or less unchanged with low fertility in the elite group in all populations, with the possible exception of Iceland, and the highest levels among farmers in the United States and Canada. Except in Iceland workers have 0.05-0.10 higher child-woman ratio than the elite, while farmers in United States and Canada have around 0.2 more children than the elite group. Thus compared to the average child-woman ratios of between 0.7-0.9 these differences are considerable given the powerful control for spatial heterogeneity as well as individual characteristics such as age, age difference between spouses, household status and migration history. The predicted child-woman ratios in Figures 2b-6b shows that maximum socioeconomic differences ranges from about 10 percent to 50 percent in the different populations. This shows that socioeconomic status was an important determinant of net fertility in the early phases of the fertility transition, and that this effect was not a simple by-product of spatial heterogeneity.

Turning to the adjustment variables in M3, female employment is clearly related to lower fertility, but the magnitude of the effects differ quite a bit across the populations. In Iceland the coefficient is small and not statistically significant while in the other four populations they are of a similar magnitude. Here marital net fertility is about 0.12-0.19 lower when the woman is in the labor force, which is larger or similar to the biggest socioeconomic differences. In Sweden and Canada there is also an additional negative effect of the female labor force participation rate in the community, but this effect is quite small. Our measure of education (teachers/100 school children) has the expected negative sign in all cases, but is not statistically significant in Iceland and Canada. Hence, high educational orientation in the community is associated with lower net marital fertility and low educational orientation is associated with high fertility. However, also in this case the magnitude of the effect is quite limited. Low proportions employed in agriculture is also connected to low net fertility over and above the individual level association between socioeconomic status and fertility, which adds further support to the adjustment hypothesis, but also here the effects are small. Taken together, while the individual level measure of female labor force participation yields quite strong effects, at least in some of the countries, the community level effects are typically quite small on individual net marital fertility.

Looking instead at innovation in M4, migration status is only weakly connected to fertility and the direction of the association differs across countries. Thus individual migration status seems unimportant for net marital fertility. At the community level both proportion migrants and child-woman ratios have the expected signs. Living in a community with more migrants reduces fertility while living in a community with a high child-woman ratio is associated with higher net fertility. While the effects of the proportion migrants are rather small the magnitudes of the coefficients for community level child-woman ratio are sizeable. Living in a community with a high child-woman ratio is associated with about 0.2-0.5 children lower net fertility than living in a community with low child-woman ratio.

Finally, in the full model (M5) all variables are included. Most effects are similar to the partial models (M3, M4) but in the case of teachers/100 school children they are quite different. Apparently the association between community level educational orientation and individual net fertility is much weaker when we add the innovation variables, implying that we should be cautious before reading too much interpretation into this association.

By and large, the results are consistent in showing clear socioeconomic differences in net fertility in early stages of the fertility transition. The elite group stands out with low fertility while farmers in several cases have the highest. When looking at the traditional explanatory variables, however, the results are quite weak both in terms of innovation and adjustment.

Conclusions

In this paper the aim has been to study socioeconomic differences in fertility during the initial stages of the fertility transition using large scale micro data for five different populations in the north Atlantic region. Micro censuses have the great advantage of offering individual level data spanning entire countries and with sample sizes big enough to enable a careful control of contextual variables and unmeasured spatial heterogeneity. On the other hand we lack a longitudinal perspective, at least until several censuses can be linked to form a panel. Moreover, the number of variables available at the individual level is often quite limited in this kind of data.

Our approach was to look at socioeconomic differences measured by a reduced version of the HISCLASS scheme adding a number of variables at both the individual/family and the community level. Using community level fixed effects we also controlled for unobserved spatial heterogeneity. The results showed large socioeconomic differentials in the early stages of the fertility transition. Overall, the elite group of professionals, managers, clerical and sales personnel (comprising between 10 and 20 percent of the populations studied) showed considerably lower net fertility (child-woman ratios) than other groups, while in most populations farmers had the highest net fertility. Both findings are clearly in line with expectations. While the elite groups often had higher fertility than other groups in pre-transitional contexts, this changed during the transition when these groups acted as forerunners in the decline. In the previous literature this has been explained by changing costs and benefits of children, the emergence of a quantity-quality trade off and diffusion of new attitudes to both control and family limitation following secularization or modernization more generally.

We tried to discriminate between these different explanations by adding contextual controls capturing the processes just mentioned. Admittedly the measures were quite weak as they referred to the community level rather than to individual families, which naturally reduced their explanatory power. The results also showed very limited effects of the variables on marital net fertility at the individual level. Even though the variables usually showed the expected sign, the magnitudes were small both in absolute terms and in relation to other individual-level measures. This makes it difficult to draw firm conclusions about the explanations for the observed socioeconomic differentials, i.e. whether due to adjustment or innovation, or perhaps a combination of the two.

What remained clear from the analysis was that socioeconomic status was a very important factor in the fertility transition. Moreover, even though spatial heterogeneity clearly explained some of these differences half or more remained also after controlling for it. In the full model, including all control variables, marital net fertility was typically about 0.1 lower among workers (unskilled or lower skilled) than among the elite, which should be compared to average child woman ratios of about 0.7-0.8.

Our results also pointed to considerable similarities between the different populations, with the possible exception of Iceland which showed a different socioeconomic pattern. They were all at similar phases of the fertility transition and clearly the socioeconomic pattern was similar in all populations.

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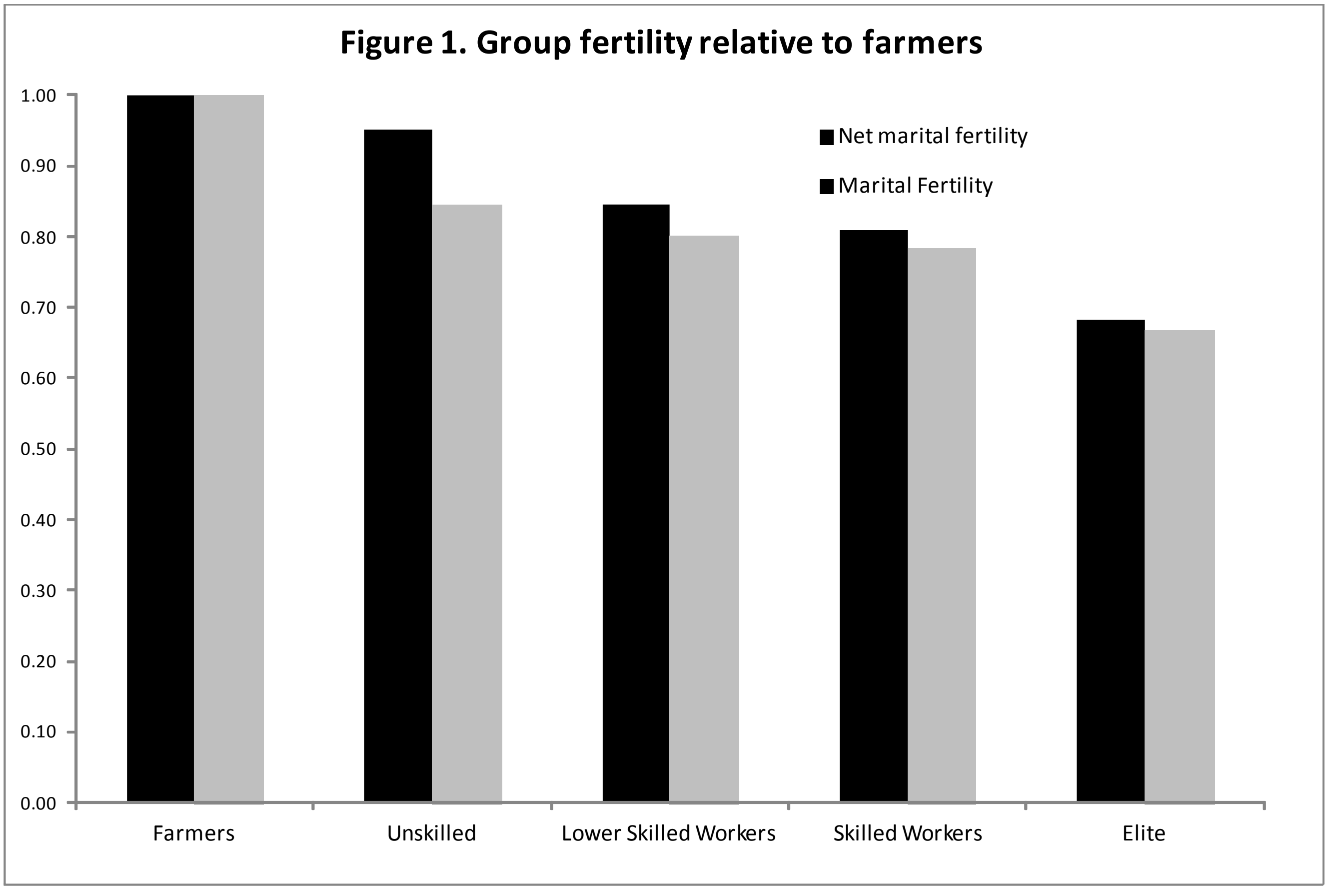
Figure 1. Group fertility relative to farmers
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Net marital fertility
Marital Fertility
Farmers
Unskilled
Lower Skilled Workers
Skilled Workers
Elite

Table 1. Census characteristics

	Year	Sample Fraction %	Geo-Unit	Persons	Married Women 15-54
Canada	1901	5	District	264,686	35,642
Iceland	1901	100	Parish	83,139	6,981
Norway	1900	100	Municipality	2,294,599	260,085
Sweden	1900	100	Parish	5,200,111	619,096
United States	1900	5	County	3,852,852	589,526

Table 2. Descriptive statistics

	SWEDEN	ICELAND	NORWAY	USA	CANADA
SES					
Elite	14.0	11.4	16.7	19.6	17.2
Skilled Workers	13.0	6.6	13.7	11.9	13.2
Farmers	32.4	33.2	33.1	33.8	38.9
Lower Skilled Workers	13.7	22.5	25.0	15.6	11.8
Unskilled Workers	21.7	9.3	9.9	16.8	14.8
NA	5.1	16.9	1.6	2.3	4.3
Woman in labor force					
Not in labor force	99.4	1.9	93.5	1.4	98.5
In labor force	0.6	12.3	6.5	4.6	1.5
NA	0.0	85.9	0.0	94.0	0.0
Age					
15-19	0.4	0.3	0.6	3.3	1.7
20-24	6.5	6.3	7.5	14.1	10.7
25-29	13.6	13.8	14.8	18.2	17.0
30-34	15.9	16.7	16.8	17.2	17.2
35-39	18.2	20.7	17.4	15.7	17.1
40-44	17.4	16.4	15.9	13.0	14.8
45-49	15.0	14.6	14.7	10.3	11.7
50-54	13.0	11.2	12.3	8.2	9.9
Age difference btw spouses					
Wife Older	26.0	28.8	24.8	12.0	13.8
Husband 0-2 older	22.7	20.5	23.4	25.6	25.9
Husband 3-6 older	26.3	22.0	25.0	31.5	29.9
Husband >6 years older	24.9	28.7	26.9	31.0	30.4
Household status					
Lodger	3.1	6.9	2.4	4.5	3.9
Head family	96.9	93.1	97.6	95.5	96.1
Migrant status					
Both migrants	13.9	-	32.0	35.1	18.2
Wife mig. & husband non-mig.	9.8	-	17.0	8.2	5.1
Wife non-mig. & husband mig.	10.9	-	13.8	13.3	8.5
Both non-migrants	65.3	-	37.2	43.4	68.2
Children>4 years in hh					
No	29.6	32.7	32.0	36.7	32.9
Yes	70.4	67.3	68.1	63.3	67.1
Female Labour Force Participation					
Low < 1° quartile	22.0	23.9	20.8	11.4	29.4
Medium 1°-3° quartile	45.4	58.1	63.3	39.5	42.7
High ≥ 3° quartile	32.6	18.1	15.9	49.1	28.0
Teachers/100 children 7-14					
Low < 1° quartile	23.8	44.8	21.1	11.2	29.2
Medium 1°-3° quartile	56.3	30.9	42.4	63.9	47.3
High ≥ 3° quartile	20.0	24.3	36.5	24.9	23.5
Proportion employed in agriculture					
Low < 1° quartile	51.4	29.1	46.9	53.7	25.1
Medium 1°-3° quartile	35.8	51.6	36.8	33.8	41.5

High ≥ 3° quartile	12.8	19.3	16.3	12.5	33.4
CWR					
Low < 1° quartile	22.9	15.0	15.3	35.1	24.8
Medium 1°-3° quartile	50.6	63.9	58.7	51.9	46.1
High ≥ 3° quartile	26.5	21.0	25.9	13.1	29.1
Migrants proportion					
Low < 1° quartile	17.3	-	18.7	17.6	24.0
Medium 1°-3° quartile	40.2	-	37.3	60.7	51.6
High ≥ 3° quartile	42.5	-	44.0	21.7	24.3
Total	100	100	100	100	100
N	619 096	6 981	260 085	589 526	35 642
Geo-groups	2 531	294	595	2 818	208

Table 3. Regression estimates of number of children.

MODEL 1, BASIC OLS MODEL

	SWEDEN		ICELAND		NORWAY		USA		CANADA	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
SES										
Elite	ref.		ref.		ref.		ref.		ref.	
Skilled workers	0.117	0.000	-0.059	0.246	0.072	0.000	0.113	0.000	0.118	0.000
Farmers	0.197	0.000	0.185	0.000	0.190	0.000	0.344	0.000	0.302	0.000
Lower skilled workers	0.171	0.000	-0.044	0.247	0.132	0.000	0.134	0.000	0.127	0.000
Unskilled workers	0.140	0.000	-0.100	0.030	0.020	0.002	0.203	0.000	0.212	0.000
NA	0.050	0.000	0.132	0.001	-0.132	0.000	0.081	0.000	0.072	0.004
Age										
15-19	-0.673	0.000	-0.687	0.000	-0.769	0.000	-0.492	0.000	-0.828	0.000
20-24	-0.268	0.000	-0.313	0.000	-0.365	0.000	-0.017	0.000	-0.249	0.000
25-29	0.033	0.000	-0.004	0.920	-0.030	0.000	0.131	0.000	0.066	0.000
30-34	ref.		ref.		ref.		ref.		ref.	
35-39	-0.171	0.000	-0.063	0.066	-0.147	0.000	-0.203	0.000	-0.243	0.000
40-44	-0.506	0.000	-0.462	0.000	-0.490	0.000	-0.488	0.000	-0.579	0.000
45-49	-1.027	0.000	-1.035	0.000	-1.036	0.000	-0.813	0.000	-1.013	0.000
50-54	-1.285	0.000	-1.242	0.000	-1.348	0.000	-0.950	0.000	-1.206	0.000
Constant	1.175	0.000	1.256	0.000	1.296	0.000	0.784	0.000	1.055	0.000

MODEL 2, INDIVIDUAL DEMOGRAPHICS

	SWEDEN		ICELAND		NORWAY		USA		CANADA	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
SES										
Elite	ref.		ref.		ref.		ref.		ref.	
Skilled workers	0.097	0.000	-0.064	0.199	0.065	0.000	0.092	0.000	0.101	0.000
Farmers	0.179	0.000	0.143	0.000	0.167	0.000	0.289	0.000	0.278	0.000
Lower skilled workers	0.140	0.000	0.014	0.699	0.123	0.000	0.113	0.000	0.108	0.000
Unskilled workers	0.118	0.000	0.016	0.721	0.049	0.000	0.182	0.000	0.182	0.000
NA	0.081	0.000	0.140	0.000	-0.013	0.320	0.099	0.000	0.088	0.000
Age										
15-19	-0.457	0.000	-0.521	0.005	-0.479	0.000	-0.224	0.000	-0.494	0.000
20-24	-0.086	0.000	-0.130	0.010	-0.112	0.000	0.181	0.000	0.018	0.367
25-29	0.130	0.000	0.081	0.033	0.108	0.000	0.213	0.000	0.190	0.000
30-34	ref.		ref.		ref.		ref.		ref.	
35-39	-0.222	0.000	-0.106	0.002	-0.215	0.000	-0.238	0.000	-0.296	0.000
40-44	-0.577	0.000	-0.524	0.000	-0.579	0.000	-0.530	0.000	-0.654	0.000
45-49	-1.100	0.000	-1.082	0.000	-1.128	0.000	-0.851	0.000	-1.091	0.000
50-54	-1.351	0.000	-1.282	0.000	-1.425	0.000	-0.973	0.000	-1.270	0.000
Age difference btw spouses										
Wife older	0.043	0.000	0.033	0.266	0.012	0.010	0.020	0.000	0.028	0.066
Husband 0-2 older	ref.		ref.		ref.		ref.		ref.	
Husband 3-6 older	-0.018	0.000	0.008	0.790	-0.019	0.000	-0.007	0.011	-0.018	0.141
Husband>6 older	-0.078	0.000	-0.045	0.129	-0.091	0.000	-0.050	0.000	-0.070	0.000
Children>4 years in hh										
No	0.267	0.000	0.210	0.000	0.373	0.000	0.297	0.000	0.387	0.000
Yes	ref.		ref.		ref.		ref.		ref.	
Household status										
Head Family	ref.		ref.		ref.		ref.		ref.	
Lodger	-0.135	0.000	-0.705	0.000	-0.527	0.000	-0.349	0.000	-0.332	0.000

Constant	1.035	0.000	1.160	0.000	1.095	0.000	0.619	0.000	0.829	0.000

MODEL 3, ADJUSTMENT

	SWEDEN		ICELAND		NORWAY		USA		CANADA	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
SES										
Elite	ref.		ref.		ref.		ref.		ref.	
Skilled workers	0.098	0.000	-0.053	0.288	0.061	0.000	0.099	0.000	0.096	0.000
Farmers	0.117	0.000	0.097	0.008	0.090	0.000	0.242	0.000	0.221	0.000
Lower skilled workers	0.122	0.000	0.003	0.944	0.087	0.000	0.122	0.000	0.101	0.000
Unskilled workers	0.099	0.000	-0.004	0.925	0.034	0.000	0.178	0.000	0.158	0.000
NA	0.054	0.000	0.120	0.002	-0.030	0.024	0.092	0.000	0.061	0.015
Age										
15-19	-0.469	0.000	-0.515	0.005	-0.482	0.000	-0.258	0.000	-0.513	0.000
20-24	-0.094	0.000	-0.128	0.010	-0.114	0.000	0.162	0.000	0.009	0.654
25-29	0.125	0.000	0.081	0.032	0.106	0.000	0.206	0.000	0.186	0.000
30-34	ref.		ref.		ref.		ref.		ref.	
35-39	-0.222	0.000	-0.103	0.002	-0.214	0.000	-0.234	0.000	-0.295	0.000
40-44	-0.576	0.000	-0.522	0.000	-0.579	0.000	-0.525	0.000	-0.654	0.000
45-49	-1.101	0.000	-1.081	0.000	-1.129	0.000	-0.846	0.000	-1.089	0.000
50-54	-1.353	0.000	-1.278	0.000	-1.427	0.000	-0.967	0.000	-1.268	0.000
Age difference btw spouses										
Wife older	0.044	0.000	0.034	0.249	0.012	0.009	0.017	0.000	0.027	0.079
Husband 0-2 older	ref.		ref.		ref.		ref.		ref.	
Husband 3-6 older	-0.019	0.000	0.009	0.772	-0.022	0.000	-0.007	0.016	-0.020	0.107
Husband>6 older	-0.080	0.000	-0.044	0.139	-0.096	0.000	-0.051	0.000	-0.073	0.000
Children>4 years in hh										
No	0.258	0.000	0.208	0.000	0.368	0.000	0.285	0.000	0.382	0.000
Yes	ref.		ref.		ref.		ref.		ref.	
Household status										
Head Family	ref.		ref.		ref.		ref.		ref.	

Lodger	-0.163	0.000	-0.715	0.000	-0.549	0.000	-0.330	0.000	-0.324	0.000
Woman employed										
No	ref.		ref.		ref.		ref.		ref.	
Yes	-0.136	0.000	-0.025	0.442	-0.131	0.000	-0.188	0.000	-0.120	0.002
FLFP unmarried										
Low	0.033	0.000	-0.018	0.497	0.001	0.855	0.016	0.000	0.019	0.103
Medium	ref.		ref.		ref.		ref.		ref.	
High	-0.097	0.000	-0.001	0.986	0.021	0.000	0.001	0.618	-0.064	0.000
Teachers/100 Children 7-14										
Low	0.029	0.000	0.037	0.147	0.013	0.002	0.035	0.000	0.032	0.004
Medium	ref.		ref.		ref.		ref.		ref.	
High	-0.038	0.000	-0.050	0.077	-0.068	0.000	-0.063	0.000	-0.018	0.120
Prop. Employed in agriculture										
Low	-0.036	0.000	-0.018	0.478	-0.057	0.000	-0.049	0.000	-0.035	0.043
Medium	ref.		ref.		ref.		ref.		ref.	
High	-0.019	0.000	0.065	0.023	-0.011	0.022	0.075	0.000	0.026	0.021
Constant	1.119	0.000	1.177	0.000	1.194	0.000	0.678	0.000	0.872	0.000

MODEL 4, INNOVATION

	SWEDEN		ICELAND		NORWAY		USA		CANADA	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
SES										
Elite	ref.		ref.		ref.		ref.		ref.	
Skilled workers	0.092	0.000	-0.058	0.237	0.059	0.000	0.095	0.000	0.083	0.000
Farmers	0.107	0.000	0.091	0.009	0.101	0.000	0.230	0.000	0.183	0.000
Lower skilled workers	0.108	0.000	-0.001	0.974	0.080	0.000	0.111	0.000	0.085	0.000
Unskilled workers	0.090	0.000	-0.022	0.618	0.035	0.000	0.160	0.000	0.123	0.000
NA	0.040	0.000	0.105	0.007	-0.029	0.027	0.081	0.000	0.033	0.173
Age										
15-19	-0.482	0.000	-0.520	0.004	-0.482	0.000	-0.261	0.000	-0.562	0.000
20-24	-0.104	0.000	-0.120	0.015	-0.116	0.000	0.160	0.000	-0.029	0.136
25-29	0.119	0.000	0.078	0.037	0.104	0.000	0.206	0.000	0.165	0.000
30-34	ref.		ref.		ref.		ref.		ref.	
35-39	-0.219	0.000	-0.104	0.002	-0.214	0.000	-0.236	0.000	-0.287	0.000
40-44	-0.571	0.000	-0.505	0.000	-0.577	0.000	-0.527	0.000	-0.647	0.000
45-49	-1.092	0.000	-1.053	0.000	-1.126	0.000	-0.850	0.000	-1.085	0.000
50-54	-1.343	0.000	-1.246	0.000	-1.422	0.000	-0.973	0.000	-1.265	0.000
Age difference btw spouses										
Wife older	0.041	0.000	0.041	0.163	0.011	0.018	0.014	0.000	0.013	0.377
Husband 0-2 older	ref.		ref.		ref.		ref.		ref.	
Husband 3-6 older	-0.018	0.000	0.009	0.763	-0.021	0.000	-0.007	0.011	-0.018	0.144
Husband>6 older	-0.079	0.000	-0.034	0.245	-0.094	0.000	-0.056	0.000	-0.068	0.000
Children>4 years in hh										
No	0.253	0.000	0.198	0.000	0.367	0.000	0.278	0.000	0.358	0.000
Yes	ref.		ref.		ref.		ref.		ref.	
Household status										
Head Family	ref.		ref.		ref.		ref.		ref.	

Lodger	-0.150	0.000	-0.695	0.000	-0.560	0.000	-0.329	0.000	-0.332	0.000
Migrant Status										
Both migrants	-0.015	0.000	-	-	-0.001	0.816	0.087	0.000	0.030	0.040
Wife mig. & husband non-mig.	0.009	0.009	-	-	0.016	0.001	-0.001	0.732	-0.021	0.316
Wife non-mig. & husband mig.	0.006	0.058	-	-	0.004	0.455	0.016	0.000	0.020	0.247
Both non-migrants	ref.				ref.		ref.		ref.	
Migrants proportion										
Low	0.031	0.000	-	-	0.018	0.000	0.024	0.000	0.075	0.000
Medium	ref.				ref.		ref.		ref.	
High	-0.059	0.000	-	-	-0.070	0.000	-0.052	0.000	-0.028	0.000
CWR										
Low	-0.142	0.000	-0.217	0.000	-0.062	0.000	-0.128	0.000	-0.186	0.000
Medium	ref.		ref.		ref.		ref.		ref.	
High	0.121	0.000	0.277	0.000	0.104	0.000	0.198	0.000	0.231	0.000
Constant	1.103	0.000	1.154	0.000	1.143	0.000	0.655	0.000	0.870	0.000

MODEL 5, FULL MODEL

	SWEDEN		ICELAND		NORWAY		USA		CANADA	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
SES										
Elite	ref.		ref.		ref.		ref.		ref.	
Skilled workers	0.093	0.000	-0.051	0.295	0.060	0.000	0.095	0.000	0.084	0.000
Farmers	0.092	0.000	0.062	0.086	0.079	0.000	0.236	0.000	0.198	0.000
Lower skilled workers	0.104	0.000	-0.006	0.880	0.073	0.000	0.114	0.000	0.087	0.000
Unskilled workers	0.086	0.000	-0.035	0.437	0.031	0.000	0.170	0.000	0.131	0.000
NA	0.036	0.000	0.092	0.018	-0.029	0.029	0.088	0.000	0.039	0.110
Age										
15-19	-0.484	0.000	-0.512	0.005	-0.487	0.000	-0.263	0.000	-0.561	0.000
20-24	-0.106	0.000	-0.120	0.015	-0.119	0.000	0.159	0.000	-0.030	0.121
25-29	0.118	0.000	0.079	0.035	0.102	0.000	0.205	0.000	0.165	0.000
30-34	ref.		ref.		ref.		ref.		ref.	
35-39	-0.219	0.000	-0.102	0.002	-0.213	0.000	-0.234	0.000	-0.286	0.000
40-44	-0.570	0.000	-0.505	0.000	-0.576	0.000	-0.526	0.000	-0.646	0.000
45-49	-1.093	0.000	-1.053	0.000	-1.126	0.000	-0.849	0.000	-1.086	0.000
50-54	-1.343	0.000	-1.246	0.000	-1.422	0.000	-0.973	0.000	-1.265	0.000
Age difference btw spouses										
Wife older	0.041	0.000	0.041	0.158	0.011	0.014	0.015	0.000	0.013	0.373
Husband 0-2 older	ref.		ref.		ref.		ref.		ref.	
Husband 3-6 older	-0.018	0.000	0.009	0.778	-0.022	0.000	-0.006	0.020	-0.017	0.162
Husband>6 older	-0.079	0.000	-0.034	0.245	-0.095	0.000	-0.054	0.000	-0.066	0.000
Children>4 years in hh										
No	0.250	0.000	0.198	0.000	0.364	0.000	0.275	0.000	0.357	0.000
Yes	ref.		ref.		ref.		ref.		ref.	
Household status										
Head Family	ref.		ref.		ref.		ref.		ref.	

Lodger	-0.157	0.000	-0.701	0.000	-0.550	0.000	-0.315	0.000	-0.326	0.000
Woman employed										
No	ref.		ref.		ref.		ref.		ref.	
Yes	-0.145	0.000	-0.019	0.550	-0.135	0.000	-0.178	0.000	-0.130	0.001
FLFP unmarried										
Low	0.014	0.000	-0.046	0.076	0.010	0.016	-0.001	0.869	0.017	0.140
Medium	ref.		ref.		ref.		ref.		ref.	
High	-0.039	0.000	-0.027	0.331	0.017	0.000	0.008	0.002	0.004	0.798
Teachers/100 Children 7-14										
Low	0.005	0.050	0.043	0.090	0.002	0.722	0.007	0.041	0.010	0.356
Medium	ref.		ref.		ref.		ref.		ref.	
High	-0.002	0.364	-0.027	0.340	-0.032	0.000	-0.010	0.000	0.013	0.261
Prop. Employed in agriculture										
Low	-0.024	0.000	-0.009	0.723	-0.030	0.000	0.008	0.007	0.047	0.011
Medium	ref.		ref.		ref.		ref.		ref.	
High	-0.009	0.006	0.032	0.265	-0.019	0.000	0.003	0.397	-0.010	0.360
Migrant Status										
Both migrants	-0.012	0.000	-	-	0.001	0.754	0.086	0.000	0.037	0.014
Wife mig. & husband non-mig.	0.010	0.005	-	-	0.016	0.001	-0.002	0.545	-0.019	0.360
Wife non-mig. & husband mig.	0.007	0.044	-	-	0.006	0.282	0.016	0.000	0.023	0.178
Both non-migrants	ref.				ref.		ref.		ref.	
Migrants proportion										
Low	0.022	0.000	-	-	0.014	0.002	0.032	0.000	0.073	0.000
Medium	ref.				ref.		ref.		ref.	
High	-0.039	0.000	-	-	-0.046	0.000	-0.054	0.000	-0.045	0.000
CWR										
Low	-0.132	0.000	-0.224	0.000	-0.064	0.000	-0.127	0.000	-0.187	0.000
Medium	ref.		ref.		ref.		ref.		ref.	
High	0.118	0.000	0.266	0.000	0.097	0.000	0.198	0.000	0.244	0.000
Constant	1.126	0.000	1.173	0.000	1.179	0.000	0.651	0.000	0.844	0.000

MODEL 6a, FIXED EFFECTS

	SWEDEN		ICELAND		NORWAY		USA		CANADA	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
SES										
Elite	ref.		ref.		ref.		ref.		ref.	
Skilled workers	0.095	0.000	-0.051	0.307	0.062	0.000	0.093	0.000	0.083	0.000
Farmers	0.083	0.000	0.044	0.264	0.085	0.000	0.239	0.000	0.195	0.000
Lower skilled workers	0.111	0.000	-0.009	0.817	0.074	0.000	0.104	0.000	0.087	0.000
Unskilled workers	0.088	0.000	-0.031	0.507	0.027	0.000	0.162	0.000	0.132	0.000
NA	0.031	0.000	0.087	0.037	-0.031	0.022	0.080	0.000	0.045	0.078
Age										
15-19	-0.482	0.000	-0.511	0.006	-0.479	0.000	-0.259	0.000	-0.563	0.000
20-24	-0.104	0.000	-0.141	0.005	-0.113	0.000	0.163	0.000	-0.030	0.118
25-29	0.118	0.000	0.079	0.039	0.106	0.000	0.207	0.000	0.166	0.000
30-34	ref.		ref.		ref.		ref.		ref.	
35-39	-0.221	0.000	-0.101	0.003	-0.215	0.000	-0.237	0.000	-0.287	0.000
40-44	-0.575	0.000	-0.517	0.000	-0.580	0.000	-0.530	0.000	-0.646	0.000
45-49	-1.099	0.000	-1.078	0.000	-1.132	0.000	-0.852	0.000	-1.088	0.000
50-54	-1.352	0.000	-1.277	0.000	-1.429	0.000	-0.976	0.000	-1.271	0.000
Age difference btw spouses										
Wife older	0.040	0.000	0.044	0.142	0.011	0.016	0.013	0.000	0.011	0.480
Husband 0-2 older	ref.		ref.		ref.		ref.		ref.	
Husband 3-6 older	-0.019	0.000	0.013	0.685	-0.022	0.000	-0.006	0.025	-0.018	0.133
Husband>6 older	-0.083	0.000	-0.040	0.188	-0.097	0.000	-0.055	0.000	-0.068	0.000
Children>4 years in hh										
No	0.251	0.000	0.191	0.000	0.365	0.000	0.277	0.000	0.355	0.000
Yes	ref.		ref.		ref.		ref.		ref.	
Household status										
Head Family	ref.		ref.		ref.		ref.		ref.	

Lodger	-0.157	0.000	-0.768	0.000	-0.573	0.000	-0.331	0.000	-0.334	0.000
Migrant Status										
Both migrants	0.002	0.541	-	-	0.008	0.087	0.090	0.000	0.048	0.004
Wife mig. & husband non-mig.	0.012	0.001	-	-	0.014	0.003	0.003	0.469	-0.017	0.406
Wife non-mig. & husband mig.	0.011	0.002	-	-	0.006	0.275	0.023	0.000	0.029	0.089
Both non-migrants	ref.		ref.		ref.		ref.		ref.	
Constant	1.094	0.000	1.220	0.000	1.142	0.000	0.625	0.000	0.895	0.000
sigma_u	0.131		0.261		0.090		0.177		0.210	
sigma_e	0.784		0.842		0.803		0.789		0.846	
rho	0.027		0.088		0.012		0.048		0.058	

MODEL 6b, FIXED EFFECTS (NO MIGRANT STATUS)

	SWEDEN		ICELAND		NORWAY		USA		CANADA	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
SES										
Elite	ref.		ref.		ref.		ref.		ref.	
Skilled workers	0.094	0.000	-0.051	0.307	0.062	0.000	0.098	0.000	0.083	0.000
Farmers	0.081	0.000	0.044	0.264	0.083	0.000	0.236	0.000	0.193	0.000
Lower skilled workers	0.111	0.000	-0.009	0.817	0.074	0.000	0.110	0.000	0.086	0.000
Unskilled workers	0.088	0.000	-0.031	0.507	0.027	0.000	0.169	0.000	0.132	0.000
NA	0.030	0.000	0.087	0.037	-0.031	0.020	0.081	0.000	0.040	0.119
Age										
15-19	-0.482	0.000	-0.511	0.006	-0.480	0.000	-0.269	0.000	-0.566	0.000
20-24	-0.104	0.000	-0.141	0.005	-0.113	0.000	0.155	0.000	-0.031	0.107
25-29	0.118	0.000	0.079	0.039	0.106	0.000	0.203	0.000	0.166	0.000
30-34	ref.		ref.		ref.		ref.		ref.	
35-39	-0.221	0.000	-0.101	0.003	-0.215	0.000	-0.233	0.000	-0.286	0.000
40-44	-0.575	0.000	-0.517	0.000	-0.580	0.000	-0.524	0.000	-0.644	0.000
45-49	-1.099	0.000	-1.078	0.000	-1.132	0.000	-0.842	0.000	-1.084	0.000
50-54	-1.352	0.000	-1.277	0.000	-1.429	0.000	-0.962	0.000	-1.266	0.000
Age difference btw spouses										
Wife older	0.040	0.000	0.044	0.142	0.011	0.013	0.013	0.000	0.010	0.491
Husband 0-2 older	ref.		ref.		ref.		ref.		ref.	
Husband 3-6 older	-0.019	0.000	0.013	0.685	-0.022	0.000	-0.005	0.054	-0.018	0.134
Husband>6 older	-0.083	0.000	-0.040	0.188	-0.097	0.000	-0.050	0.000	-0.067	0.000
Children>4 years in hh										
No	0.250	0.000	0.191	0.000	0.365	0.000	0.278	0.000	0.355	0.000
Yes	ref.		ref.		ref.		ref.		ref.	
Household status										
Head Family	ref.		ref.		ref.		ref.		ref.	

Lodger	-0.157	0.000	-0.768	0.000	-0.573	0.000	-0.334	0.000	-0.334	0.000
Constant	1.097	0.000	1.220	0.000	1.148	0.000	0.654	0.000	0.905	0.000
sigma_u	0.131		0.261		0.090		0.174		0.208	
sigma_e	0.784		0.842		0.803		0.790		0.846	
rho	0.027		0.088		0.012		0.046		0.057	

Note: Models 6a-6b include fixed effects at lowest geographical level.
N and number of geographical units are available in Table 1.

Figure 2a. Sweden: Predicted CWR ratio based on Model 2 (OLS)

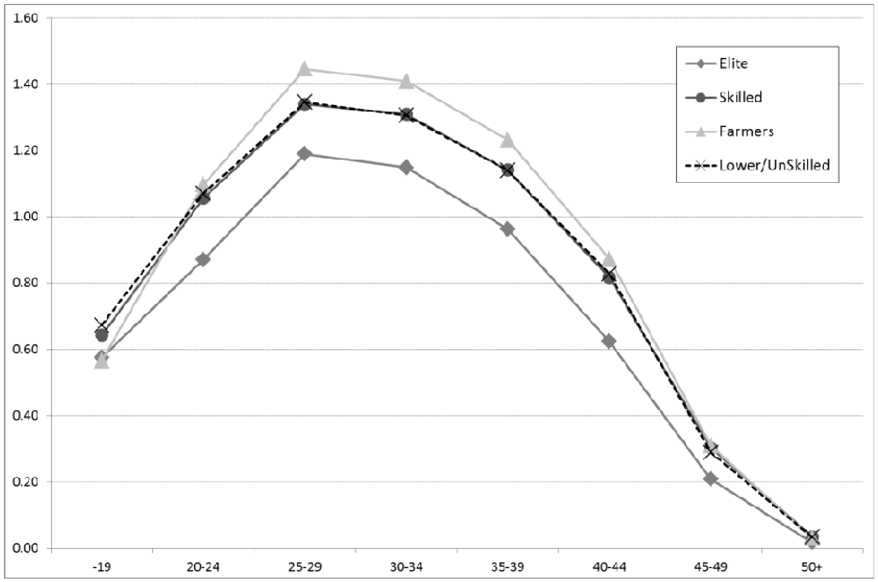

Figure 2b. Sweden: Predicted CWR ratio based on Model 6b (FE)

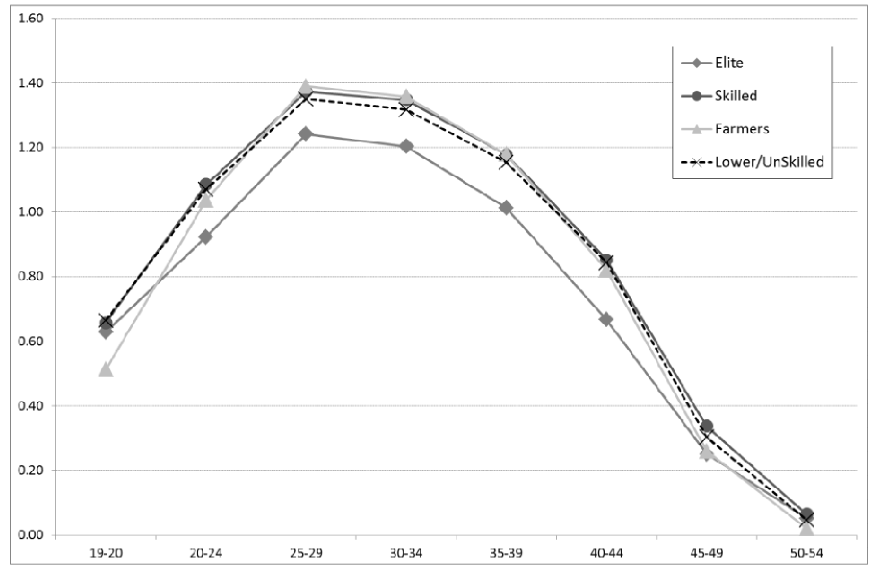

Figure 3a. Iceland: Predicted CWR ratio based on Model 2 (OLS)

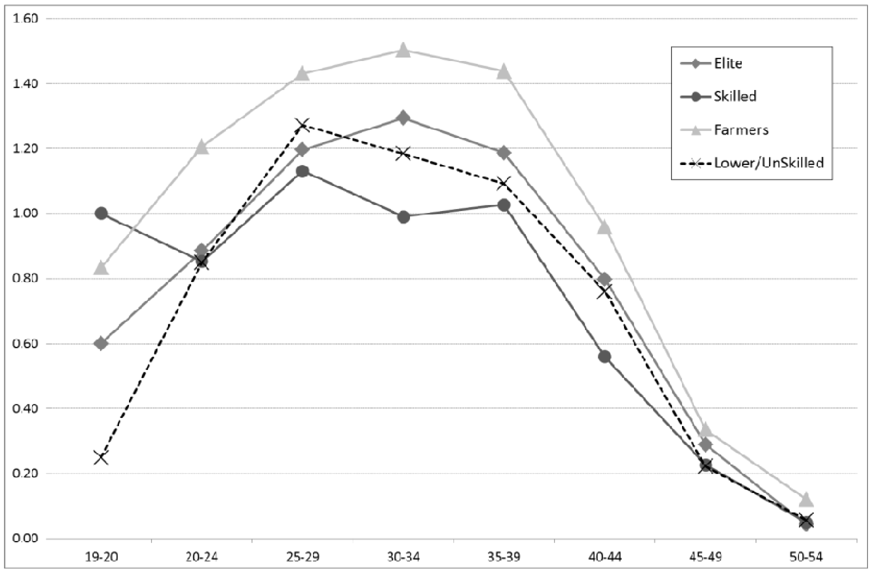

Figure 3b. Iceland: Predicted CWR ratio based on Model 6b (FE)

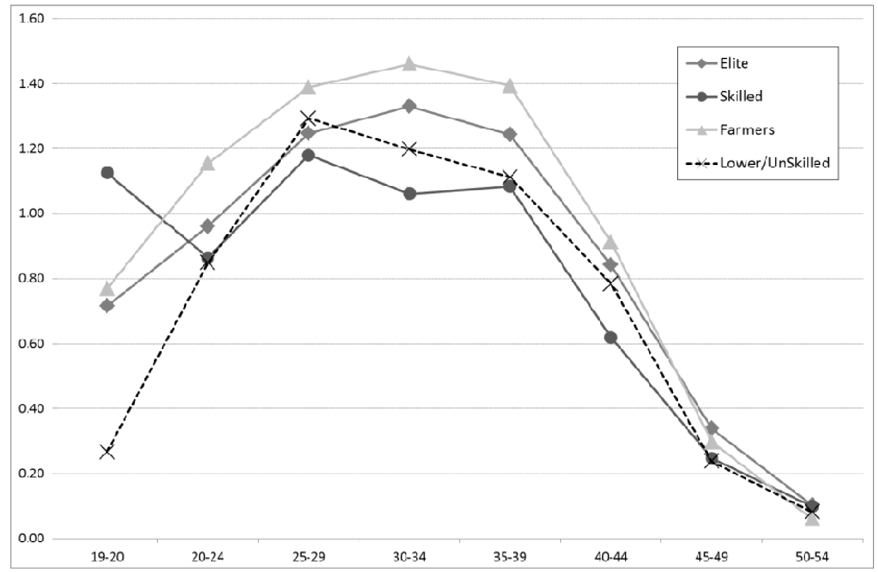

Figure 4a. Norway: Predicted CWR ratio based on Model 2 (OLS)

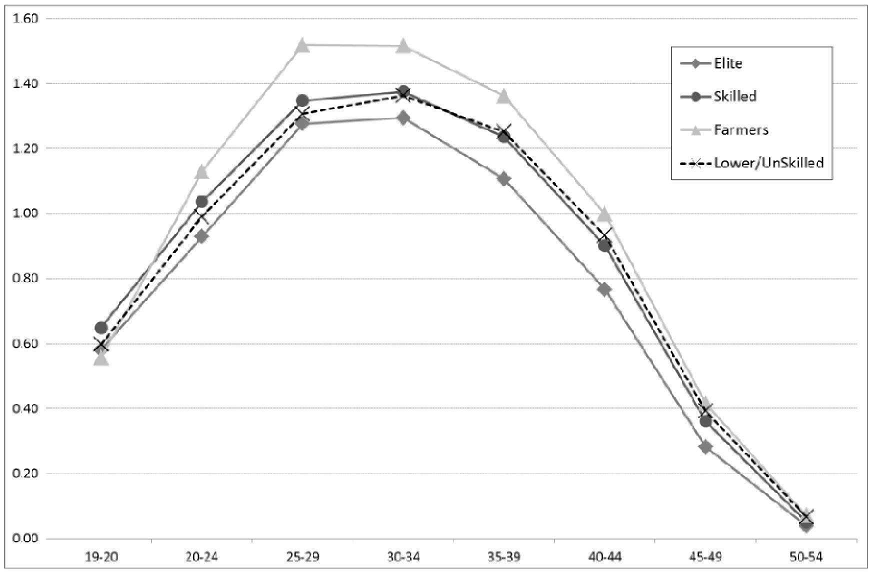

Figure 4b. Norway: Predicted CWR ratio based on Model 6b (FE)

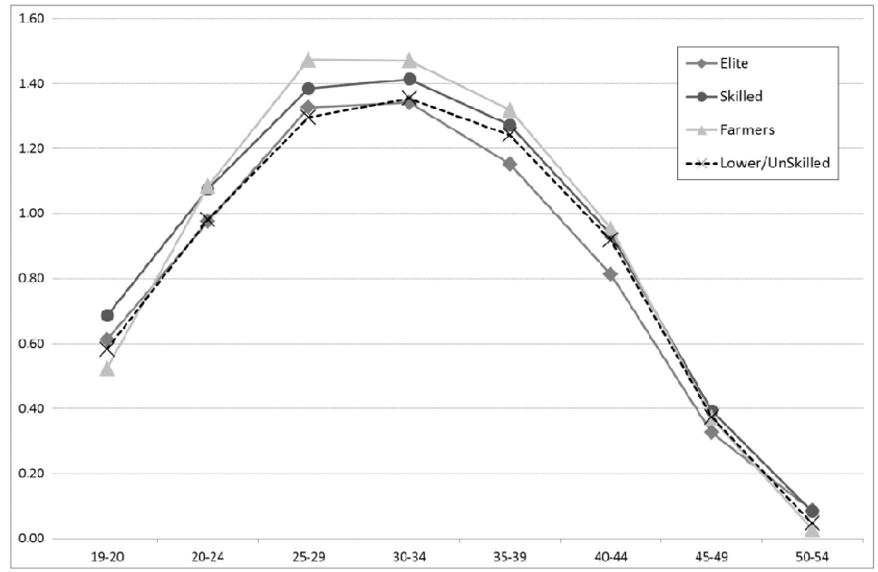

Figure 5a. Canada: Predicted CWR ratio based on Model 2 (OLS)

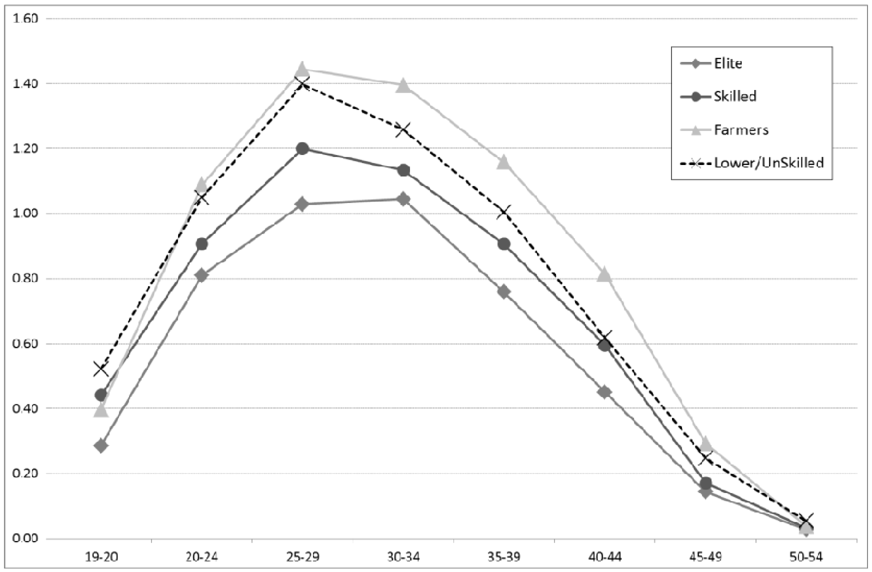

Figure 5b. Canada: Predicted CWR ratio based on Model 6b (FE)

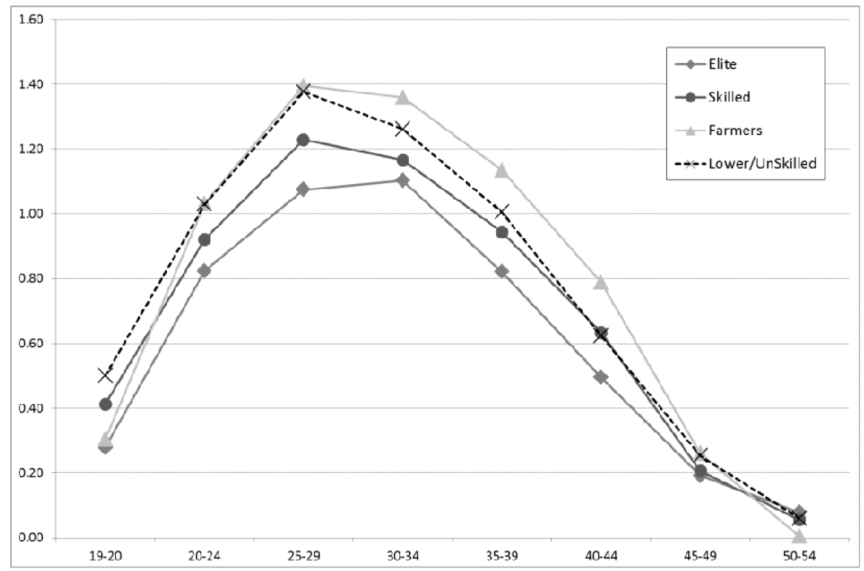

Figure 6a. USA: Predicted CWR ratio based on Model 2 (OLS)

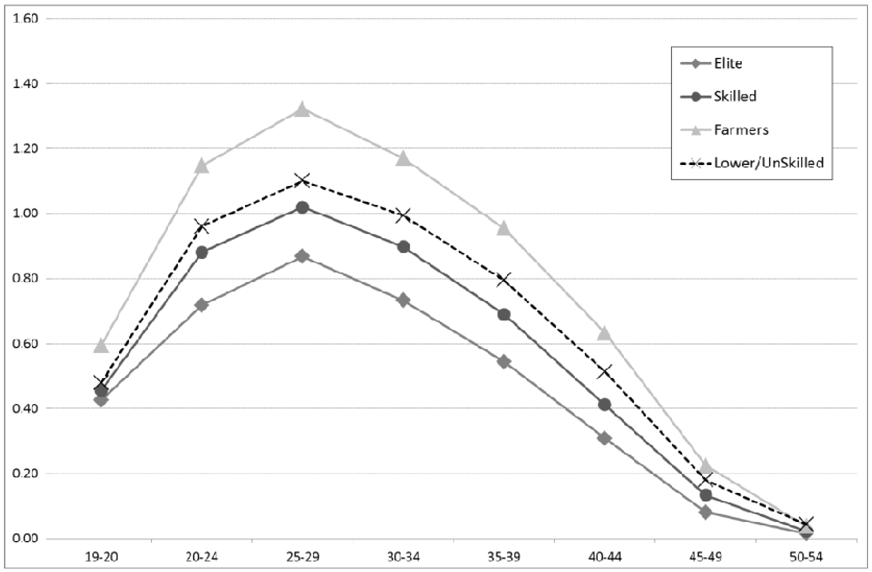

Figure 6b. USA: Predicted CWR ratio based on Model 6b (FE)