Cities and the Rise of Working Women*

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Abstract

This paper analyzes how urban migration shaped women's economic and marital outcomes in the early twentieth century. We use linked census data to show that female migrants to large cities in Sweden and the United States experienced substantial increases in formal employment and reductions in marriage and fertility. Focusing on migrants to Sweden's largest city—Stockholm—we find increases in formal employment of about 50 percentage points and similarly large decreases in marriage rates that largely persist over the life cycle. Employment increases were primarily driven by a transition into service jobs, reflecting the early structural shift toward services in major American and European cities.

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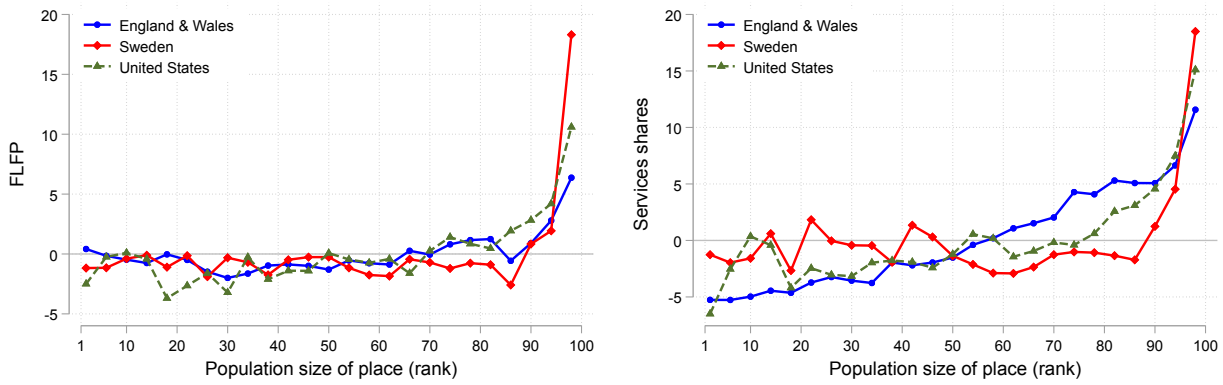
1 Introduction

Women's entry into the formal labor market was one of the central societal changes of the twentieth century and represents the rising part of the U-shaped relationship between women's economic activity and development (Goldin, 1995; Costa, 2000; Mammen and Paxson, 2000; Olivetti, 2014; Stanfors and Goldscheider, 2017; Ngai *et al.*, 2024; Feng *et al.*, 2025). At early stages of development, women's work was often informal and took place on family farms and in household enterprises. The shift from farm to factory led to declining economic activity rates, as prevailing social norms constrained women's formal employment. In particular, the decision to enter or exit formal employment was closely tied to family formation, as most women left the formal labor market upon marriage (Goldin, 1980, 2006; Kleven *et al.*, 2025). As the economy shifted towards less stigmatized service jobs, women were drawn into formal employment in large numbers (Olivetti and Petrongolo, 2016; Ngai and Petrongolo, 2017; Rendall, 2018). The aggregate rise in services and women's formal employment occurred primarily after World War II, but national trends may mask spatial variation in the timing of structural change and employment opportunities for women (Fogli and Veldkamp, 2011).

Figure 1 documents substantial variation in women's formal employment across counties and parishes in early twentieth-century Britain, Sweden, and the United States. The left panel shows that the share of women in gainful work rises sharply in the most populated areas in all three countries, suggesting that large cities may have offered unique formal labor-market opportunities for women. The right panel shows that these places had already shifted toward services, indicating that large cities may have reached the rising part of the U-shape several decades before less populous areas.

This paper studies how migration to large cities shaped women's formal employment and family formation outcomes in the early twentieth century. During American and European industrialization, millions of men and women left rural hinterlands in search of opportunity in the city. Yet analyzing the returns to migration for women is complicated because they are notoriously difficult to link across historical censuses, due to name changes at marriage. We therefore use Swedish census data from 1880–1910, which consistently record women's maiden names and allow us to construct a large, representative linked sample, which we complement with recent links of women across U.S. censuses by Buckles *et al.* (2025).

Our main focus is on women's entry into the formal labor market—henceforth referred to as female labor force participation (FLFP) for brevity—and jointly determined marriage decisions. The focus on formal employment does not imply that women's informal and unpaid work was economically unimportant, but rather that our main objective is to study women's



(A) FLFP (B) Service jobs

FIGURE 1: THE GEOGRAPHY OF FLFP AND SERVICE JOBS IN THE EARLY TWENTIETH CENTURY.

Notes: This figure shows the average FLFP rate (Panel A) and share of service jobs (Panel B) in counties (United States) and parishes (England & Wales or Sweden) where counties and parishes are grouped into 25 equal-sized bins within each country based on their population. For each bin, we calculate the percentage-point differences between the FLFP rate and service-employment share in these places and the corresponding averages observed across all places in each country. The data are based on the 1911 census for England & Wales and the 1910 census for Sweden and the United States. See Online Appendix D.1 for details on data construction.

entry into independent formal employment outside the home—a historically consequential transition that can be measured in census data and was associated with changing forms of autonomy and social identity (Goldin, 1990, 2021; Costa, 2000; Burnette, 2024).[1] In addition, our focus on formal employment is also motivated by its close link to women's family formation in this period (Goldin, 1980; Kleven *et al.*, 2025).

We first descriptively analyze differences in FLFP among women who grew up in rural areas and later moved across Sweden's 2,400 rural and urban parishes by the early twentieth century. Female migrants to the most populous locations saw substantial increases in FLFP compared to stayers, which closely mirrors the non-linear pattern in Figure 1. In contrast, male migrants experience similarly high returns to migration regardless of their destination. The patterns for marriage and fertility are the opposite of FLFP: female migrants to the most populous destinations were considerably less likely to marry and have children.

Motivated by the sharp non-linearity in the returns to migration for women, we zoom in

[1]Women entering formal employment and their changing social identity and independence became the object of intense public debate. A telling example is the 1888 U.S. Annual Report of the Commissioner of Labor, titled *Working Women in Large Cities* (United States Bureau of Labor, 1889). The report was followed by a stream of special investigations, commissions, and official reports on women's entry into the formal labor market in the United States, with similar inquiries appearing in Britain and Sweden during the same period.

on migration to Sweden's largest city: Stockholm.[2] Between the mid-nineteenth and early twentieth centuries, the city tripled in size due to substantial inward migration. Women greatly outnumbered men in Stockholm and were also overrepresented among migrants, who made up more than half of the city's residents. Notably, more than half of the prime-aged women in Stockholm were in the labor force, nearly three times the rate in rural areas.

To analyze how moving to Stockholm shaped FLFP, we compare the outcomes of migrants to the capital with migrants to other destinations. A barebones specification without controls shows that women who move to Stockholm are about 54 percentage points more likely to enter the formal labor market than migrants to rural areas. Migrants to Stockholm also saw sizable reductions in the probability of being married or having a child: about 51 and 48 percentage points compared to rural migrants. These gaps in FLFP, marriage, and fertility remain substantial throughout the life cycle.

A key concern is that women who move to Stockholm may differ systematically from those moving to other rural and urban locations, which we address using three empirical strategies. First, we control for a rich set of individual, family, and origin characteristics that account for sorting on observables. Second, we include family fixed effects and compare sisters migrating to different destinations, which absorbs all shared individual and family traits. Third, we add family-by-destination fixed effects and compare sisters to their brothers who move to the *same* destination, which limits the potential role of within-family sorting to the extent that it does not vary by sex. Together, these strategies and a battery of additional robustness checks suggest that neither between- nor within-family sorting across destinations materially affects our results.

To further strengthen a causal interpretation of our results, we use an instrumental variables (IV) strategy that instruments for migration to Stockholm using two sources of variation: (i) that women are more likely to migrate if they have an older sister; and (ii) that proximity of the childhood parish to Stockholm increases the likelihood of migrating there in adulthood. The instrument is defined as the *interaction* of these variables, while controlling for their separate components directly, as well as fixed effects for individual birth order, birth year, number of siblings, and childhood parish. Reassuringly, IV estimates are in line with our baseline estimates.

Why did moving to a large city increase women's formal employment? In the early twentieth century, the U.S. Census Report noted that women were drawn to urban areas because of their distinct labor markets: "[i]n the urban communities there are many opportunities

[2]Stockholm is broadly representative of other major American and European urban areas in this period in terms of size. Its population of 342,000 inhabitants in the early twentieth century made it slightly larger than rapidly growing American cities such as Minneapolis, Los Angeles, or Washington, D.C., and moderately smaller than Detroit or San Francisco.

for the employment of women, in the rural comparatively few" (United States. Bureau of the Census, 1913, p. 260). In line with a large literature documenting the role of the service sector in providing "respectable" jobs for women (Goldin, 1995; Olivetti, 2014; Mammen and Paxson, 2000; Olivetti and Petrongolo, 2016; Rendall, 2018; Ngai *et al.*, 2024), we show that the probability of being employed in a service job increases by about 40 percentage points among migrants to Stockholm, which accounts for the vast majority of the increase in FLFP. Migrants primarily entered low-skilled service work but were more likely to move into higher-skilled occupations with age, consistent with learning and greater returns to experience in large cities (Glaeser and Maré, 2001; De la Roca and Puga, 2017; Eckert *et al.*, 2022). Moreover, migrants to Stockholm exhibit greater incomes and rates of intergenerational income mobility, while these economic gains came without the steep mortality penalty experienced by male migrants.

Was the increase in formal employment among migrants to Stockholm accompanied by increases in economic activity, or did it solely reflect a shift from informal to formal work? Using a proxy for women's total work that includes the extensive margin of informal work, we show that migrants to Stockholm experienced a 23 percentage point increase, which suggests that they experienced an increase in economic activity. We also find a spatial analogue to the aggregate U-shape when examining total work: it increases among migrants to rural areas (where women work informally in agriculture), declines for those moving to smaller cities that were often dominated by industry, and rises again among those moving to large cities such as Stockholm (where women work in the formal service sector). While we cannot directly measure the intensive margin of hours worked, these patterns align with aggregate evidence that the downward portion of the U-shape reflected the decline of informal agricultural work as women moved to industrializing cities, whereas the upward-sloping portion reflected women's entry into formal service jobs (Goldin, 1990; Olivetti, 2014; Ngai *et al.*, 2024).

Lastly, we use the linked U.S. census data between 1880 and 1910 from Buckles *et al.* (2025) to show that all our main results are similar when analyzing female migrants to large U.S. cities. While effects are larger among Swedish migrants, we find relatively greater effects among U.S. Black and immigrant women consistent with social norms limiting native-born White women's entry into low-skill service jobs (Stigler, 1946; Ward, 2026; Withrow, 2026).

Our paper provides systematic evidence on how urban migration shaped women's labor-market and marriage outcomes in the early twentieth century. We document distinct patterns of returns for female migrants, which contrasts a vast literature that studies the returns to migration for men (for example, Abramitzky *et al.*, 2012; Andersson and Molinder, 2025; Berger *et al.*, 2023; Collins and Wanamaker, 2014; Long, 2005; Long and Ferrie, 2013; Ward, 2022; Zimran, 2024). Whereas male migrants experienced higher LFP across urban desti-

nations, gains for women were concentrated in the largest cities, without the well-known urban mortality penalty observed among men. Moreover, women's LFP increases were also mirrored in sharp reductions in marriage and fertility, which relates to a literature showing that changing female earnings opportunities and urbanization contributed to the fertility transition that often began in large cities (Schultz, 1985; Galor and Weil, 1996; Dribe, 2009; Jensen, 2012; Klüsener *et al.*, 2019). More broadly, by using standard methods that have been used to link men (Abramitzky *et al.*, 2020), we move beyond most prior studies that rely on marriage records, genealogical data, or pseudo-links to track women (Olivetti and Paserman, 2015; Olivetti *et al.*, 2024; Eriksson *et al.*, 2026; Withrow, 2026), contributing to recent research studying women's economic and marriage outcomes using systematically linked data (Ager *et al.*, 2026; Althoff *et al.*, 2025; Dribe *et al.*, 2019; Feigenbaum and Gross, 2024; Jácome *et al.*, 2025; Rashid, 2025).

A large literature descriptively examines women's labor market outcomes in cities during industrialization (for example, Fuchs and Moch, 1990; Hill, 1994; Engel, 1994; Deutsch, 2000; Pooley and Turnbull, 2005; You, 2020), and the role of urban manufacturing in shaping FLFP (Tilly and Scott, 1978; Goldin, 1980; Goldin and Sokoloff, 1982; Karlsson, 1996; Kim, 2005). We instead provide systematic evidence showing that the early rise of services accounts for most of the estimated increase in FLFP among migrants, which contributes to work documenting the key role of the service sector in shaping aggregate FLFP over the past century (Goldin, 1990, 1995; Lee and Wolpin, 2006; Akbulut, 2011; Ngai and Petrongolo, 2017; Bridgman *et al.*, 2018; Buera *et al.*, 2019; Cerina *et al.*, 2021; Ngai *et al.*, 2024). Thus, while services drove the rising part of the U-shape in the latter half of the twentieth century (Goldin, 1995; Costa, 2000; Mammen and Paxson, 2000; Olivetti, 2014; Stanfors and Goldscheider, 2017; Ngai *et al.*, 2024; Feng *et al.*, 2025), large cities may have been on the upward part of the U-shape several decades before. Lastly, we document heterogeneity in the effects on service employment among migrants that appear to vary with social norms shaping women's access to service jobs complementing research on the cultural and social determinants of FLFP (Fernández *et al.*, 2004; Fernández, 2007; Fogli and Veldkamp, 2011; Fernández, 2013; Alesina *et al.*, 2013; Olivetti *et al.*, 2020).

2 Historical Context

Sweden underwent a rapid economic transformation during the latter half of the nineteenth century with the urban population share more than tripling to about 23% (Bairoch, 1988). A key driver of urbanization was migrants being drawn by the pull of expanding urban labor markets, paralleling patterns in Britain and the United States (Long, 2005; Ward, 2022;

Zimran, 2024). Migrants moved from low-income areas toward cities and regions offering higher wages and better employment opportunities (Enflo *et al.*, 2014b; Lundh *et al.*, 2005; Eriksson and Stanfors, 2022; Berger *et al.*, 2023; Andersson and Molinder, 2025). Similarly, evidence from relative prices suggests a key role for pull factors in Sweden, as structural change before World War I was driven primarily by rising demand for nonagricultural labor similar to the United States and much of Europe (Alvarez-Cuadrado and Poschke, 2011). The substantial urban wage premium for unskilled workers is also consistent with urban labor markets exerting pull (Lundh, 2012; Lundh and Prado, 2015). At the same time, migration was associated with a wide range of both pull and push factors including the local decline of agriculture and the distance to the emerging railroad network (Online Appendix Section A.3).[3]

An early shift toward services in large cities further drove urban labor demand, consistent with models in which higher incomes or larger markets sustain an urban service sector (Glaeser *et al.*, 2001; Duranton and Puga, 2004; Buera and Kaboski, 2012). Stockholm illustrates this shift, as services displaced industry as the engine of urban growth by the early twentieth century (Karlsson, 1996; Johansson and Persson, 2004). Figure 2, Panel A, shows that services accounted for approximately 40% of employment in Stockholm County in 1900. Notably, other regions did not reach this level until the 1960s. Panel B documents a similar pattern in other European countries, which shows that the concentration of services in the most densely populated areas was a general feature in industrializing countries (Michaels *et al.*, 2012).

The service sector in large cities was potentially important for women's formal employment, given that social norms limited their opportunities in industrial jobs (Goldin, 1990; Olivetti, 2014; Ngai *et al.*, 2024). Indeed, Panel A of Figure 3 shows that FLFP was systematically higher in places with larger service sectors, though this does not capture informal work. In Stockholm, more than 50% of women aged 20–55 were recorded in the labor force, compared with 37% in other urban areas and 18% in rural areas (Online Appendix Table A.2). While urban women often were employed in domestic services, they also worked as seamstresses, proprietors, retail salespersons, and clerks (Online Appendix Table A.3). The high levels of FLFP were also mirrored in low marriage rates: fewer than 40% of women living in Stockholm were married or had at least one child in 1910, compared with 50–60% of women in rural areas and smaller cities (Online Appendix Table A.2).

Many young women and men responded to the growing labor-market opportunities in

[3]Migration over longer distances was facilitated by reduced travel costs due to the railroads, which also attracted rural migrants to cities along the network (Berger and Enflo, 2017). Online Appendix Table A.1 and Online Appendix Figure A.2 show that the median distances from the birth parish are 178 and 166 km, respectively, for rural-born female and male migrants to Stockholm in the 1910 census.

large cities, which is evident in the relatively high migration rates in Sweden compared to Britain and the United States (Long and Ferrie, 2013; Berger *et al.*, 2023). Migration was facilitated by the widespread tradition of life-cycle service (Dribe, 2000; Sundvall *et al.*, 2023). It involved children leaving the parental home in their early 20s (Online Appendix Figure A.3), in order to work and accumulate savings before forming a family. Marriage typically occurred later and was seldom the main motive for leaving the parental home (Vikström, 2003; Sundvall *et al.*, 2023). Figure 3, Panel B, provides suggestive evidence of a response to the rise of service jobs by showing that a greater share of the population consisted of (in)migrants in places that had shifted toward services in the early twentieth century.

The pull of urban labor markets was reinforced by the limited opportunities available to women in rural labor markets. In the past, they had left the parental home for work as farm hands or maids, typically facing harsh working conditions and low pay.[4] Many urban migrants also worked in low-skill service jobs, but conditions and pay were often better than in the countryside both in low- and high-skill jobs (Vikström, 2003; Burnette and Stanfors, 2020). Additionally, qualitative evidence suggests that women both in Sweden and the U.S. were drawn to cities because they offered greater autonomy and independence (Vikström, 2003; Withrow, 2026), which potentially further attracted rural women to large cities.

3 Data

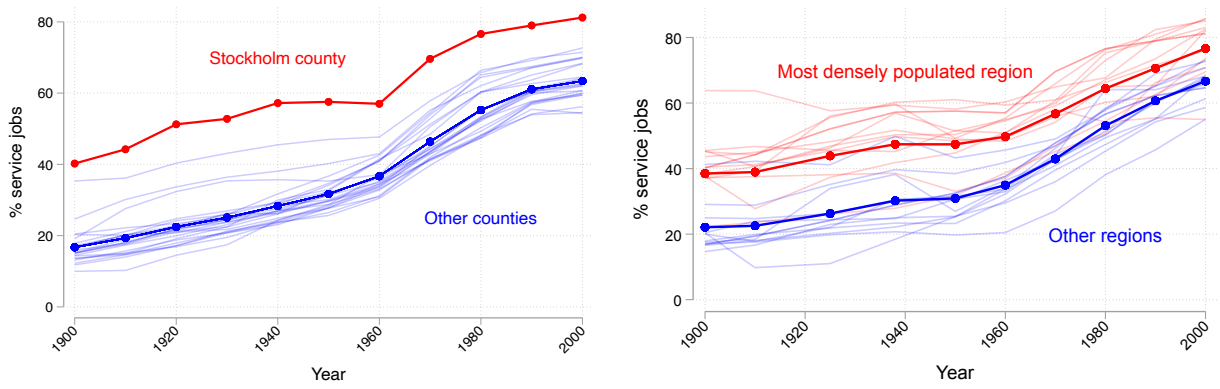
Our main data come from the full-count Swedish decennial censuses between 1880 and 1910 obtained from IPUMS International (Ruggles *et al.*, 2025a), which we use to create a linked sample of women whom we can follow from childhood into adulthood.[5]

Linking Procedure. We use probabilistic linking methods to link children observed in their childhood households in 1880 to the 1910 census when they are adults. We briefly describe the linkage procedure here and describe it in more detail in Online Appendix D.3.

Two features of the Swedish censuses are important for record linkage. First, the censuses were based on registers maintained by local priests, who annually recorded all inhabitants of Sweden's roughly 2,400 parishes and demographic information such as dates of birth, death,

[4] In her influential investigative work, journalist Ester Blenda Nordström documented the grueling conditions faced by female agricultural workers, including 16-hour workdays and limited leisure time, amounting to a few hours one day each week (Nordström, 1914). Marriage brought little relief: between household responsibilities and agricultural labor, rural wives faced some of the most strenuous conditions of any social group at the time (Carlsson, 1966).

[5] We acknowledge the Swedish National Archives, Umeå University, and the Minnesota Population Center for producing the underlying census data. We also complement our main linked sample with links generated by Wisselgren *et al.* (2014), which are distributed by IPUMS International (Ruggles *et al.*, 2025a).



(A) Swedish Regions (B) European Regions

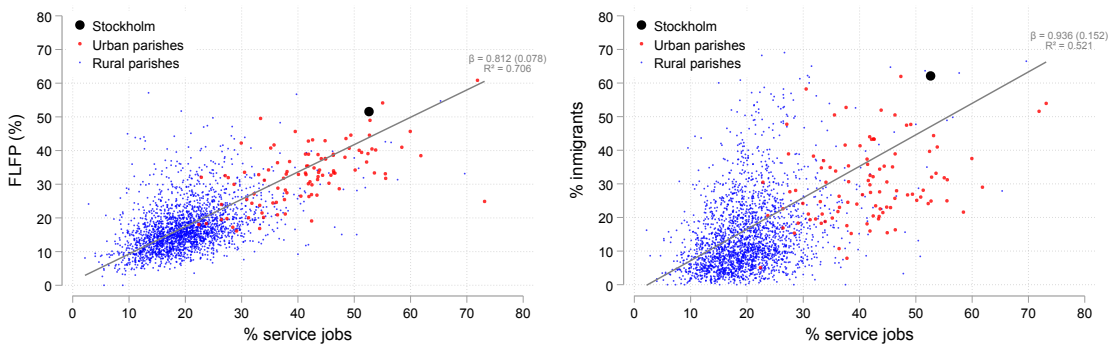
Figure 2: Service Sector Size in European Regions, 1900–2000.

Notes: This figure displays the evolution of the employment share of services in European regions 1900–2000. Panel A displays the employment share of services across Swedish counties. Stockholm county, including the capital, is highlighted in bold red. The average for all other counties is highlighted in bold blue. Data on the employment shares for Swedish (NUTS-3) regions are drawn from Enflo *et al.* (2014a). Panel B separately shows the outcome for the most densely populated NUTS-2 region within each country in red and the average share in other regions in blue. Countries included are Austria, Belgium, Denmark, Finland, France, Germany, Italy, Norway, Portugal, Spain, Sweden, and the UK. The cross-country averages for the densest and less dense regions are highlighted in bold lines. Data on the employment share of services are drawn from Rosés and Wolf (2018).

and marriage. These church books form the basis of the world's oldest continuous population records and are known for the accuracy of their name spellings and birth years, which improves record-linkage accuracy. Moreover, because Swedish parishes covered relatively small geographic areas compared with British parishes or U.S. counties, the registers allow us to construct a relatively narrow set of candidate matches. Second, priests typically recorded women's maiden names either instead of or alongside their married names, allowing married women to be identified across censuses.

To link individuals across censuses, we focus on individuals who are aged 0–16 in 1880 and thus likely to reside in their parental household. We identify candidate matches in the 1910 census that have identical reported sex, birth year, and parish of birth, and then compare the name similarity of both first and last names. Using this approach, we link 66% of individuals born between 1864 and 1880 in the 1910 census back to the 1880 census. The retrospective match rate over a period of 30 years (1880–1910) compares favorably to the existing literature using linked historical census data.[6] Crucially, our linkage rates are

[6]For comparable time periods, Long and Ferrie (2013) links 20.3–21.9% in Britain and the U.S., Ward (2022) links 9.1% of linkable sons in a triple-linked sample from U.S. censuses 1910–1940, and Modalsli (2017) links 37% in Norway. Similarly, the recent Census Tree project (see Buckles *et al.*, 2025), which



(A) FLFP (B) Migration

Figure 3: Service Jobs, FLFP, and Migration Across Swedish Parishes, 1910

Notes: This figure displays FLFP among prime-aged (20–55) women, the share of prime-aged women that are living in a different county than their county of birth, and the share of prime-aged men and women that are employed in services (HISCO major groups 0–5) across 2,400 Swedish parishes in the 1910 census. For presentational purposes, we exclude a small number of military and congregational/religious parishes and aggregate the parishes that constitute the city of Stockholm. We separately report data for urban and rural parishes using the official definitions of urban status in the census. The figure also displays a best-fit line and its estimated slope and robust standard error based on a parish-level regression weighted by parish populations.

similar for men and women (65% and 67%, respectively).

While we are able to achieve relatively high match rates, it is possible that matched individuals differ systematically from those that are unmatched, possibly yielding unrepresentative estimates. For example, it is easier to link individuals with uncommon names, and name commonality has been linked to traits such as individualism and socio-economic status. With this in mind, Online Appendix Table D.1 compares matched individuals to the full population in the same age cohorts on observable characteristics measured in 1880. The table shows overall small differences between the two samples, suggesting that our sample is representative of the population. Moreover, we show that our results are very similar when we use probabilistic weights to account for selection into linkage (see Online Appendix Table A.5).

Main Outcomes. Our main outcomes are primarily constructed from the census data. First, we follow the IPUMS definition of labor force participation to measure FLFP: a woman is defined as in the labor force if she has a reported occupation (excluding students and titles capturing noble ranks), her occupational title is not related to another household member

combines genealogical and more traditional linking methods, achieves rates between adjacent censuses of about 69–86% for men, and 58–79% for women.

(for example, "worker's widow"), and she is above 15 years old. Reported occupations are classified according to the HISCO system (van Leeuwen *et al.*, 2002) and then mapped to HISCLASS (van Leeuwen and Maas, 2011), which categorizes occupations into 12 broad groups based on their skill requirements, allowing us to distinguish between high- and low-skill jobs.[7]

Second, we measure family-formation outcomes using individuals' marital status as recorded in each census. We also use information on relationships among household members and on children residing in the household to construct measures of women's fertility.[8]

Third, we use each individual's reported parish of residence in each census to capture migration between rural and urban locations between census years. We classify parishes as urban or rural according to official 1880 classifications and aggregate urban parishes that belong to the same city. While the city underwent rapid growth, Stockholm had consistent borders throughout our sample period, consisting of the inner city areas of Gamla Stan, Södermalm, Norrmalm, Östermalm, and Kungsholmen (Ström, 2005).

Lastly, we rely on two additional data sources to measure income and mortality outcomes. First, following established approaches, we construct real income scores using the 1930 census—the first Swedish census to collect income data—to capture the average income associated with a given occupation and location (see Online Appendix Section D.2 for details). Second, we obtain information on age at death by linking individuals from the 1910 census to the Swedish Death Index (*Dödboken*), which contains dates of death for individuals who died in Sweden. Using the linkage procedure described above, we achieve a forward match rate of 82% for both men and women born between 1864 and 1880 and observed in the 1910 census.

Sample Definitions. Our sample is restricted to linked individuals (1880 to 1910) aged 0–16 in 1880 who reside with their father and mother in rural parishes at least five kilometers from a city.[9] We denote this full sample of 274,711 women as the "full sample from rural origins". In our main analysis, where we compare siblings moving to different destinations,

[7]The 12 HISCLASS groups are: 1) Higher managers; 2) Higher professionals; 3) Lower managers; 4) Lower professionals, 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.

[8]Similarly, we use information on household relationships to identify siblings and to collect data on fathers' occupations, mothers' labor force participation, as well as a number of characteristics at the household level: number of generations in the family, the number of siblings, presence of extended family, and presence of non-relatives.

[9]Imposing a distance cutoff ensures that we study individuals with truly rural origins and avoids including rural parishes that may later be incorporated by a nearby city. However, the choice of a specific distance cutoff is not important for our results: Online Appendix Figure A.4 shows that our results are very similar when applying distance cutoffs between zero and 10 kilometers.

we restrict attention to individuals who have an identified sister living in the same family in 1880 and that have left their rural origin parish by 1910. These restrictions leave us with 70,512 women from 31,137 families. We denote this sample as the "migrant sisters sample". Summary statistics for different samples are presented in Online Appendix Table A.4.

4 Empirical Strategy

We first estimate outcomes of migrants to destinations of different population size, using the full sample from rural origins, whether or not they migrate. Destinations are sorted into one hundred bins of equal width in terms of log population in 1910. As described above, a *destination* is either a parish (in rural areas) or a set of parishes that make up an urban area based on the official designations of urban areas in 1910. The estimating equation is:

$$Y_{if} = \sum_{p=1}^{100} \beta^p Migrant_{if}^p + \gamma \mathbf{X}_{if} + \delta \mathbf{W}_f + \varepsilon_{if} \tag{1}$$

where Y_{if} is the outcome of interest for individual i from family f. $Migrant_{if}^p$ is a binary variable taking the value 1 if the individual has moved to a destination in population bin p by 1910, and the value 0 if the individual remains in the origin parish. Thus, β^p is a set of coefficients estimated for each population bin, capturing how migrants to these destinations of varying size differ from individuals staying at their origin parish. $\mathbf{X}_{if}$ is a matrix of individual-level controls: fixed effects for birth year, birth order, being the eldest sister, and having a disability. $\mathbf{W}_f$ is a matrix of household-level controls measured in 1880: a full set of origin parish fixed effects, father's percentile income score rank, family size, an indicator for mother's LFP, fixed effects for father's 1-digit HISCO occupation, indicators of whether the household consists of an extended family (relatives only) or a composite household (family and non-relatives), as well as whether the household is multigenerational.

To isolate the role of migrating to the largest urban areas, we then focus on a sample of migrants—defined as having left the childhood parish in 1910—and estimate the returns to migration to Stockholm relative to other destinations. To do so, we estimate:

$$Y_{if} = \beta_1 Sthlm\ Migrant_{if} + \beta_2 Other\ Urban\ Migrant_{if} + \gamma \mathbf{X}_{if} + \delta \mathbf{W}_f + \varepsilon_{if} \tag{2}$$

where $Sthlm\ Migrant_{if}$ is an indicator taking the value 1 if the individual lives in Stockholm in 1910, and 0 otherwise. To differentiate between rural migrants and migrants to other urban areas, we also introduce an indicator for migration to an urban area other than Stockholm. Thus, β_1 captures the difference in outcomes between migrants to Stockholm and migrants

to rural parishes.

While the above models control for a number of individual- and family-level pre-migration variables that might influence both the decision to migrate and labor-market outcomes, there may still be many unobserved factors that can lead to bias. Therefore, we limit the analysis to comparing outcomes between sisters who live in the same family in 1880. By restricting attention to within-family variation, we hold constant all common parental influences on children, whether environmental or inherited, that may otherwise have a direct effect on both migration and our outcomes of interest. The empirical models become:

$$Y_{if} = \sum_{p=1}^{100} \beta^p Migrant_{if}^p + \gamma \mathbf{X}_{if} + \phi_f + \varepsilon_{if} \tag{3}$$

and

$$Y_{if} = \beta_1 Sthlm\ Migrant_{if} + \beta_2 Other\ Urban\ Migrant_{if} + \gamma \mathbf{X}_{if} + \phi_f + \varepsilon_{if} \tag{4}$$

where ϕ_f is a fixed effect common to siblings from family f, which we refer to as a family fixed effect. Since the family fixed effect absorbs any variation that does not vary within the family, the family-level controls are subsumed in these specifications. All standard errors are cluster-robust at the childhood family level.

The within-family model absorbs any selection in terms of family characteristics and controls for observable individual characteristics such as age, birth order, and being the eldest sister. However, migrants to Stockholm may also be inherently different from their siblings migrating to other destinations, for example in terms of ability and preferences for wage work or marriage. We further examine the role of such sorting in Section 5.5 showing that it seemingly does not explain our main results.

5 Results

5.1 Employment and Family Formation

This section documents a marked nonlinearity in the effects of migration on FLFP: women moving to the largest cities in Sweden experience substantial increases in FLFP, which coincide with similarly large declines in marriage and fertility.

Employment. Figure 4 displays estimates of Equations (1) and (3), where we examine differences in labor force participation among migrants from rural origins moving to about 2,400 different destinations compared to stayers. Female migrants moving to the most popu-

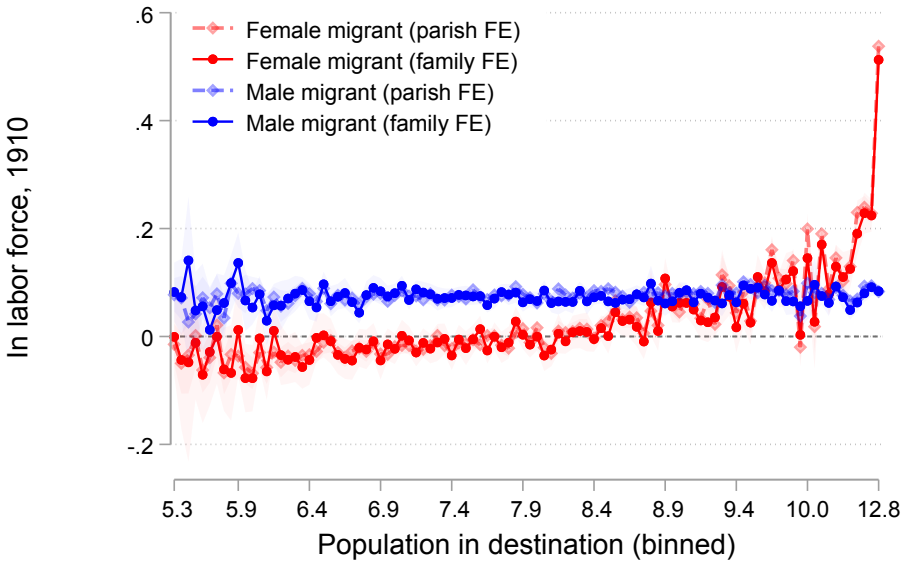
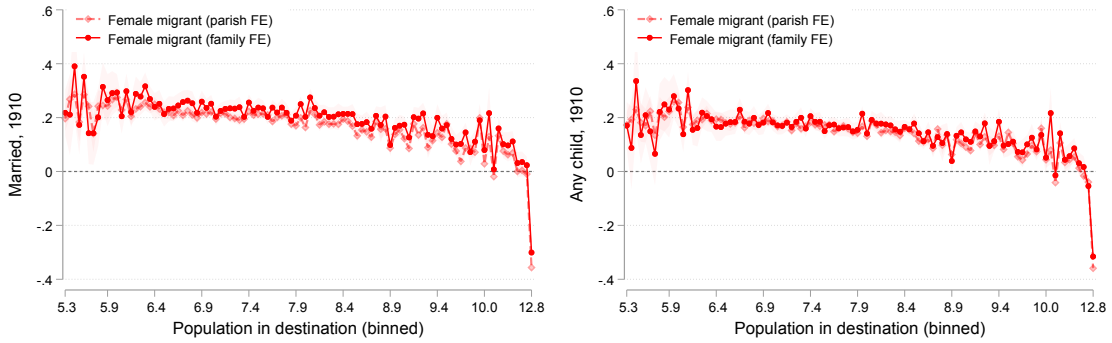


FIGURE 4: LFP BY POPULATION IN MIGRANT DESTINATION

Notes: This figure displays OLS estimates of Equations (1) and (3) using the full sample consisting of individuals born in rural parishes who have either migrated by 1910 or remained in the parish of origin (the omitted category). The outcome is an indicator taking the value one if an individual is in the labor force in 1910. Destinations are sorted into one hundred bins of equal width in terms of log population in 1910. The figure plots point estimates and 95% confidence intervals associated with moving to a given bin, relative to staying. The x-axis indicates the median destination size in each bin. Dashed shaded lines denote a specification using origin parish fixed effects and family- and individual-level controls, while solid lines denote estimates that include family fixed effects with individual-level controls. See Section 4 for the full list of control variables. Standard errors are clustered at the family level.

lous parishes are considerably more likely to be in the formal labor force compared to stayers or migrants moving to more sparsely populated areas. FLFP is similar among stayers and migrants to destinations up to the 90^{th} population percentile (8.4 log points). However, there is a marked non-linearity at the top with FLFP among migrants to the most populous destinations being considerably higher. In particular, the top bin—containing only Stockholm—displays increases in FLFP of approximately 50 percentage points. The figure also indicates that the inclusion of family fixed effects has a minor impact on estimates, indicating limited sorting based on family background.

Motivated by the non-linear relationship between FLFP and population size, we turn to Equation (2) and focus on the effect of moving to Stockholm. Restricting attention to female migrants, column 1 of Table 1, Panel A, shows that Stockholm migrants are 53.6 percentage points more likely to be in the formal labor force compared to rural migrants. The increase is substantial considering that the FLFP rate in the sample is 21%. In line with the evidence in Figure 4, migrants to other urban areas experience smaller but still



(A) Marriage (B) Any child

Figure 5: Family Formation by Population in Migrant Destination

Notes: This figure displays OLS estimates of Equations (1) and (3) using the full sample from rural origins, consisting of females born in rural parishes who have either migrated by 1910 or remained in the parish of origin (the omitted category). The outcome is an indicator taking the value one if an individual is married (Panel A) or has any child (Panel B) in 1910. Destinations are sorted into one hundred bins of equal width in terms of log population in 1910. The figure plots point estimates and 95% confidence intervals associated with moving to a given bin, relative to staying. The x-axis indicates the median destination size in each bin. Dashed shaded lines denote a specification using origin parish fixed effects and family- and individual-level controls, while solid lines denote estimates that include family fixed effects with individual-level controls. See Section 4 for the full list of control variables. Standard errors are clustered at the family level.

substantial increases: 16.4 percentage points compared to migrants moving to rural areas.[10] To account for potential individual and family characteristics that may be correlated with both migration and FLFP, column 2 adds a rich set of individual- and family-level controls, as described in Section 4. These additions yield very similar estimates, indicating modest sorting across destinations based on observable individual- and family-level characteristics.

We next use our sibling design and compare the FLFP of sisters who were observed in the same family in 1880 but had moved to different destinations by 1910. Table 1, column 3 first reproduces the results from column 2 using the migrant sisters sample, displaying nearly identical coefficients. Column 4 adds the full set of individual- and family-level controls. Again, adding these controls has a minor effect on the estimated increase in FLFP among migrants to Stockholm and other urban areas. Column 5 then introduces family fixed effects as in Equation (4). Absorbing all shared individual- and family-level characteristics that may influence both migration status and FLFP yields an estimated increase in FLFP among those migrating to Stockholm of 50.1 percentage points. Comparing this estimate to that without family fixed effects in column 3 indicates that migrants are somewhat positively

[10] Online Appendix Figure A.5 reports estimates that include separate indicators for each city with more than 20,000 inhabitants in 1910 as well as for smaller cities. Estimated effects on FLFP are broadly similar across destinations other than Stockholm, which motivates aggregating them in the main analysis.

Table 1: FLFP by Migrant Destination

Panel A. Dependent variable:	In labor force (=1)					
Sample:	Female migrants		Migrant sisters			
	(1)	(2)	(3)	(4)	(5)	(6)
Stockholm (=1)	0.536***	0.543***	0.533***	0.539***	0.501***	0.496***
	(0.005)	(0.005)	(0.007)	(0.008)	(0.011)	(0.011)
Other urban area (=1)	0.164***	0.156***	0.171***	0.161***	0.136***	0.133***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.006)	(0.006)
Panel B. Dependent variable:	Married (=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
Stockholm (=1)	-0.553***	-0.555***	-0.546***	-0.545***	-0.519***	-0.511***
	(0.005)	(0.005)	(0.007)	(0.007)	(0.010)	(0.010)
Other urban area (=1)	-0.154***	-0.143***	-0.158***	-0.146***	-0.126***	-0.123***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.006)	(0.006)
Panel C. Dependent variable:	Any child (=1)					
	(1)	(2)	(3)	(4)	(5)	(6)
Stockholm (=1)	-0.529***	-0.526***	-0.525***	-0.518***	-0.486***	-0.476***
	(0.005)	(0.005)	(0.007)	(0.007)	(0.010)	(0.010)
Other urban area (=1)	-0.146***	-0.132***	-0.150***	-0.133***	-0.111***	-0.107***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.006)	(0.006)
Individual controls	No	Yes	No	Yes	No	Yes
Family 1880 controls	No	Yes	No	Yes	No	No
Family FE	No	No	No	No	Yes	Yes
Observations	164530	164530	70512	70512	70512	70512
Mean outcome	0.729	0.729	0.709	0.709	0.709	0.709

Notes: OLS regressions. The sample in columns 1–2 consists of rural-born women who were aged 0–16 in 1880 and have left their parish of origin by 1910, while the sample is restricted to women who have at least one sister in columns 3–6 (the migrant sisters sample). *Stockholm* is an indicator taking the value one if the individual lives in Stockholm city in 1910. *Other urban area* is an indicator taking the value one if the individual lives in an urban area other than Stockholm in 1910. *Individual controls* include fixed effects for birth year, birth order, being the eldest sister, and having a disability in columns 1 to 6, as well as sex in columns 7 and 8. *Family 1880 controls* include origin parish fixed effects and a number of characteristics of the 1880 household: father's income score percentile, family size, as well as fixed effects for mother's employment, father's 1-digit HISCO occupation, and whether the household is multigenerational, extended family (relatives only), or composite family (with non-relatives). *Family fixed effects* are fixed effects for originating from the same family in 1880. Standard errors, in parentheses, are clustered at the family level. *** - $p < 0.01$, ** - $p < 0.05$, * - $p < 0.1$.

sorted on unobservables in terms of across-family characteristics. However, the difference is small with a reduction in the estimate of only 3.2 percentage points. Adding individual controls to the regression with family fixed effects in the last column decreases the estimate only slightly, suggesting that sorting on our set of observable individual characteristics *within* families is modest.

Marriage and fertility. Turning to family formation, Figure 5 displays estimates based on Equations (1) and (3) where the outcome is an indicator for being married (Panel A) or having at least one child (Panel B) in 1910. Female migrants moving to the most populous parishes are much less likely to marry and have a child than stayers. By contrast, those moving to smaller destinations are substantially *more* likely to marry and have at least one child. Thus, the large increases in formal employment observed in Figure 4 are matched by similarly strong but opposite responses in terms of family formation outcomes.

Panels B and C of Table 1 study family formation of migrants to Stockholm specifically. Our preferred estimate with family fixed effects in column 6, Panel B, indicates a 51.1 percentage point decrease in the probability of marriage by 1910 for Stockholm migrants relative to sisters moving to rural areas. In line with this, column 6 of Panel C also shows that migrants to Stockholm are 47.6 percentage points less likely to have any children by 1910. As was the case with the FLFP results, there are only minor changes to estimates when comparing samples and specifications across columns 1–6, suggesting that sorting based on family characteristics is limited in our setting.[11]

The reductions in marriage and fertility among Stockholm migrants are substantial considering that about 70% of migrants in the sample were married or had a child by 1910. Moreover, it is striking that these reductions balance out the increase in FLFP nearly one-to-one. The co-movement of marriage and fertility suggests that the reduction in fertility is largely determined by a reduction in marriage rates. However, fertility also declines conditional on marital status, operating along both the extensive and intensive margins (Online Appendix Table A.6).

Given the link between formal employment and marital status, we next explore two issues. First, we show in Online Appendix Table A.7, columns 1–2, that employment increases for both married and unmarried women. The increase in married women's LFP is small, but represents a twofold increase over the mean. Second, we address potential selection into migration based on marriage prospects. In columns 3–8 of Online Appendix Table A.7, we restrict attention to sisters who are (i) unmarried and (ii) remain in the parish of origin in

[11] Online Appendix Table A.30 also shows that the results are not driven by differences in co-habitation practices outside marriage or children born out of wedlock.

1900, comparing their outcomes by destination in 1910, which yields very similar estimates. Further restricting the sample to individuals who are (i) unmarried and (ii) have *already* migrated in 1900, we again find that Stockholm migrants exhibit higher FLFP and lower rates of family formation in 1910. Our results are thus robust to focusing on individuals whose decision to migrate occurred prior to marriage.[12]

Male vs. female migrants. Figure 4 displays starkly different employment outcomes for male migrants. In contrast to female migrants, the relationship between migration and LFP is always positive for males but remains flat across the destination size distribution. Focusing on Stockholm migrants, Online Appendix Table A.8 shows that male LFP was only 1 percentage point higher for migrants to Stockholm compared to rural areas. While male migrants exhibit lower marriage rates in Stockholm, the estimated reduction is less than half the size observed for females.

To underscore that the effects of migration are larger for women, we present estimates where we include family-by-destination fixed effects in Online Appendix Table A.9. Here we compare the outcomes for women and their brothers who have migrated to the same destination. For FLFP, estimates are almost identical, while the estimated reduction in marriage rates at about 25 percentage points remains sizable. These estimates reveal that urban migration had distinct effects for women, while also indicating that within-family sorting is not enough to explain our main results, provided it does not vary by sex. We return to this issue in greater detail in Section 5.5.

Alternative samples and statistical inference. Our results are robust to using alternative samples and statistical inference. First, Online Appendix Tables A.10 and A.11 show that results are similar when including non-migrating sisters, or only focusing on sisters moving to urban areas. Second, we show that migrants and natives have strikingly similar outcomes in Stockholm. Online Appendix Table A.12 shows that there are no statistically significant differences in FLFP or family formation when controlling for sibling fixed effects, consistent with the idea that migrants converged to outcomes of native-born women in Stockholm. Third, Online Appendix Table A.13 shows that the statistical inference for all main outcomes is robust to alternative methods of calculating standard errors.

[12]Online Appendix Figure A.6 tests how employment and family formation are bundled across the population distribution. In particular, the likelihood of working while being unmarried and without children is highest in the largest cities. However, there is also an increase in married working women in the top of the distribution, indicating early moves towards the dual-earner model.

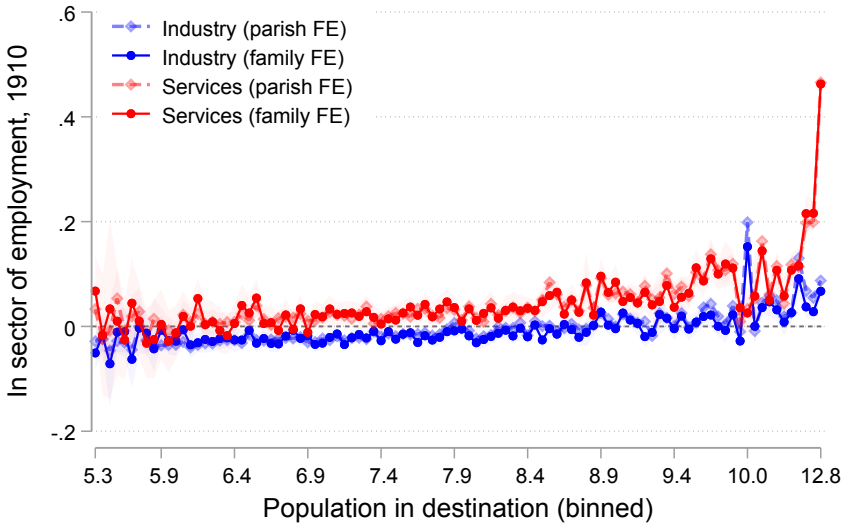


FIGURE 6: SECTOR OF EMPLOYMENT BY POPULATION IN MIGRANT DESTINATION

Notes: This figure displays OLS estimates of Equations (1) and (3) using the full sample consisting of individuals born in rural parishes who have either migrated by 1910 or remained in the parish of origin (the omitted category). The two outcomes are indicators for employment in the service and industrial sectors, respectively. Destinations are sorted into one hundred bins of equal width in terms of log population in 1910. The figure plots point estimates and 95% confidence intervals associated with moving to a given bin, relative to staying. The x-axis indicates the median destination size in each bin. Dashed shaded lines denote a specification using origin parish fixed effects and family- and individual-level controls, while solid lines denote estimates that include family fixed effects with individual-level controls. See Section 4 for the full list of control variables. Standard errors are clustered at the family level.

5.2 Services, Skills, and Income

This section shows that the rise in FLFP among migrants to Stockholm and other cities can largely be attributed to an increased entry into employment in the service sector. While employment gains are concentrated in low-skill service jobs, migrants experienced increases both in income and intergenerational mobility.

The Role of the Service Sector. Figure 6 displays estimates from Equations (1) and (3) where the outcome is an indicator for working in services or industry. Increases in service employment exhibit the same non-linear pattern as FLFP displayed in Figure 4: migrants are not more likely to work in the service sector in smaller destinations, but are over 20 percentage points more likely to transition into service work in the most populated areas.

Table 2, column 1, presents estimates of Equation (4) showing that the probability of working within the service sector is 42.4 percentage points higher for women migrating to Stockholm compared to their sisters moving to rural areas, an almost threefold increase

compared to the sample mean. Migrants to smaller urban areas also see an increased rate of employment in services, though the effect for moving to Stockholm is about five times as large. Reassuringly, the increase in service employment is also evident conditional on being employed (Online Appendix Table A.14) and when including family-by-destination fixed effects thus comparing female migrants in Stockholm and their migrant brothers in the same location (Online Appendix Table A.16).

Although the service sector is key in explaining increases in FLFP, migrants also experienced more modest increases in industrial employment.[13] Table 2, column 2, indicates that the probability of employment in industry increases by 7.5 percentage points among migrants to Stockholm. However, in contrast to the discontinuous increase in service sector employment in the most populous areas, the increase in industrial work displays a more continuous increase throughout the population distribution in Figure 6, which is also evident in the relatively large coefficient for migrants to other urban areas in Table 2, column 2.

Although large cities such as Stockholm may have been the proximate driver of changes in FLFP and family formation among urban migrants, the more fundamental economic forces underlying these effects remain an open question. We further explore the role of the service sector share at destination alongside other potential mechanisms behind our results—for example, Stockholm's higher adult sex ratio and the role of differential social norms towards female labor in the city—in Online Appendix Section A.6. In particular, Online Appendix Table A.31 shows that controlling for the service share at destination accounts for a substantial part of the positive FLFP-effect among urban migrants, with Online Appendix Tables A.32 and A.33 showing similar results for family formation. In contrast, controlling for the adult sex ratio as well as two broad measures of gender norms has limited effects on our main coefficients. Taken together, these results point to service-sector employment opportunities as playing a central role in both female migrants' transitions into formal employment and the lower rates of marriage and childbearing among Stockholm migrants.

Skill-Content of Jobs. We next show that while most migrants to Stockholm transitioned into low-skilled jobs, employment gains are observed across the skill spectrum. Table 2, column 3 shows that Stockholm migrants are 6.8 percentage points more likely to work in higher- and medium-skilled occupations than their migrant sisters, a large effect considering that only about 8% of the women in the sample work in such jobs. Column 4 shows that Stockholm migrants are about 42.6 percentage points more likely to work in low-skilled

[13] Online Appendix Table A.15 breaks down the sector of employment further according to the HISCO major groups. Apart from agriculture, which unsurprisingly displays a negative relationship to Stockholm migration, we find positive estimates for all other occupational groups.

Table 2: Sector, Skill, and Income by Migrant Destination

Dependent variable:	Sector of employment		Occupational skill		Income score		Age at death	
	Services	Industry	High	Low	ln(income)	Pct. rank	Female	Male
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stockholm (=1)	0.424***	0.075***	0.068***	0.426***	0.072***	7.333***	0.177	-2.315***
	(0.010)	(0.006)	(0.008)	(0.010)	(0.026)	(1.481)	(0.359)	(0.351)
Other urban area (=1)	0.086***	0.043***	0.018***	0.106***	-0.174***	-12.732***	0.225	-1.140***
	(0.005)	(0.003)	(0.004)	(0.005)	(0.020)	(1.314)	(0.204)	(0.241)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	70512	70512	70512	70512	6514	6514	52881	44600
Mean outcome	0.161	0.053	0.078	0.142	7.004	53.540	73.303	71.900

Notes: OLS regressions using the migrant sisters sample in columns 1 to 7 and a similar migrant brothers sample in column 8. All outcomes are measured in 1910. *Services* and *Industry* are indicators taking the value 1 for the HISCO major groups 0–5 and 7–9, respectively. Similarly, *High* corresponds to high- and medium-skilled occupations (HISCLASS groups 1–4 and 6–8), while *Low* corresponds to low-skill and unskilled occupations (HISCLASS groups 5 and 9–12). Columns 5 and 6 restrict the sample to employed individuals. *Stockholm* is an indicator taking the value 1 if the individual lives in Stockholm city in 1910, and zero if not. *Other urban area* is an indicator taking the value 1 if the individual lives in an urban area other than Stockholm in 1910, and zero if not. *Individual controls* include fixed effects for birth year, birth order, being the eldest sister, and having a disability. *Family fixed effects* are fixed effects for originating from the same family in 1880. Standard errors, in parentheses, are clustered at the family level. *** - $p < 0.01$, ** - $p < 0.05$, * - $p < 0.1$.

occupations, indicating that the overall increase in service employment is primarily driven by an increased entry into relatively low-skilled work.[14] However, a pattern of employment gains across the skill spectrum is also evident when looking at more detailed occupations.[15] Moreover, while most migrants worked in low-skill jobs, we show in Section 5.3 that they upgrade to higher-skilled occupations over time.

Income and Intergenerational Mobility. While migrants to Stockholm primarily enter low-skill service occupations, they may obtain jobs that on average pay better compared to their migrant sisters moving elsewhere. Focusing on women with reported occupations, columns 5 and 6 of Table 2 show that migration to Stockholm is associated with about a 7% higher real income score, or an increase of about seven percentile ranks in the national

[14]Online Appendix Table A.17 confirms this by breaking down the sector of employment by skill.

[15]Focusing on the ten most common occupations among migrant women in each skill group, Online Appendix Figure A.8 shows additional detail on the specific occupations that women take up across the skill spectrum. The highest increase is found for maids, followed by hand and machine sewers, both of whom are classified as low skilled. However, we also observe significant increases for several higher-skilled occupations such as working proprietors, professional nurses, cooks, and housekeepers in private service.

income distribution, compared to their sisters migrating to rural locations.[16]

A related question is whether the income gains of Stockholm migrants were also reflected in higher rates of intergenerational income mobility. We examine mobility differences in Online Appendix Figure A.7 where we plot the mean income ranks of daughters by their father's rank. Migrants to Stockholm attain higher income ranks conditional on their father's income and also exhibit lower rank-rank associations compared to stayers and migrants to other destinations, which indicates a greater level of absolute mobility and a lower degree of intergenerational persistence, respectively. We corroborate a higher level of income mobility among Stockholm migrants in Online Appendix Table A.20 showing that women who moved to Stockholm attain higher rates of absolute mobility compared to their migrant sisters, also when focusing on sisters born to families at the bottom of the income distribution.

5.3 Outcomes over the life cycle

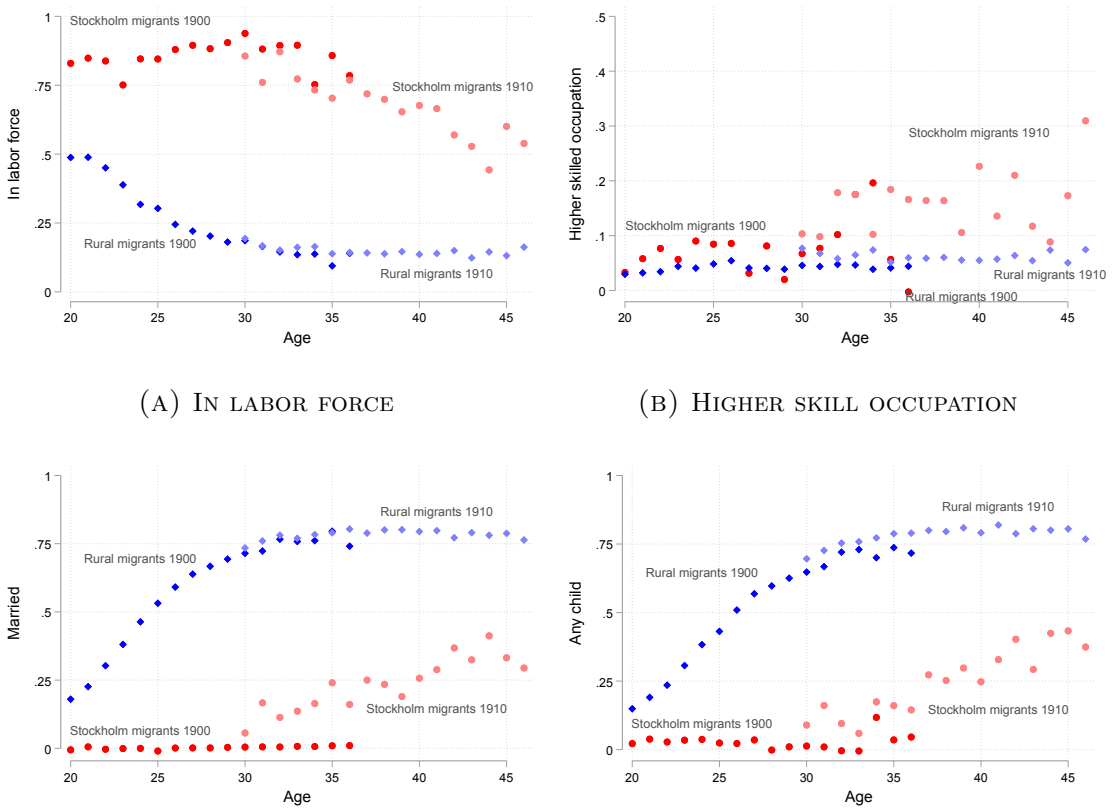
This section examines how labor market outcomes, family formation, and mortality evolved over the life cycle.

Employment and Family Formation. Figure 7 presents binned scatterplots by age for migrants both in 1900 and 1910, pooling linked migrants in both census rounds, together spanning ages 20 (the youngest cohort among 1900 migrants) to 46 (the oldest cohort among 1910 migrants), absorbing our individual controls and family fixed effects.[17] Panel A indicates that while the FLFP rates of migrants to rural areas quickly decrease between the ages of 20 and 30, Stockholm migrants remain in the labor force at high rates during the same age span. After age 30, also Stockholm migrants' FLFP rates begin to decrease, but even by their mid-40s participation rates are substantially higher than those of their sisters migrating to rural areas.

Panel B of Figure 7 examines the likelihood of migrants working in higher-skilled occupations by age, for both Stockholm and rural destinations. Stockholm migrants exhibit signs of skill upgrading over time. In their 20s, migrants are about as likely to work in higher-skilled

[16] Because income scores are observed only for employed women, they may be subject to stronger positive selection outside Stockholm, where female employment is less common. We address this concern in two ways. First, Online Appendix Table A.18 uses household income per adult as the outcome, thereby including married women without reported occupations. Household income is about 20% higher for Stockholm migrants. Stockholm migrants also have higher female-to-male income ratios, indicating greater economic independence. Second, Online Appendix Table A.19 adds 1-digit occupation fixed effects to compare workers in broadly similar occupations. The resulting estimates are larger for both real and nominal income scores, suggesting that our baseline estimate in Table 2 may be a lower bound.

[17] Since we do not observe the same individuals at each age, these figures should be interpreted as suggestive evidence of the life-cycle dynamics of migrants.



(A) In labor force

(B) Higher skill occupation

(C) Marriage

(D) Any child

Figure 7: Outcomes over the Life Cycle

Notes: This figure displays binned scatter plots using an extended migrant sisters sample which pools data on migrants at two points in time: in the 1900 census (when women in the sample are aged 20–36) and in the 1910 census (when they are aged 30–46). The outcomes are indicators for being in the labor force (Panel A), having a high- or medium-skilled occupation according to HISCLASS (Panel B), being married (Panel C), and having any child (Panel D) for female migrants to Stockholm and rural areas between ages 20 and 46. Dark red and blue markers indicate the outcomes of migrants to Stockholm and rural areas in 1900, respectively. Light red and blue markers refer to outcomes in 1910. All estimates include family fixed effects and individual controls (birth order fixed effects and an indicator for being the eldest sister) following the method of Cattaneo *et al.* (2024).

occupations in Stockholm as in rural areas, yet in their 30s and 40s Stockholm migrants are considerably more likely to do higher-skilled work. Turning instead to following the same individuals over time, Online Appendix Table A.21 shows that individuals who move to Stockholm in 1900 are on average 8.4 percentage points more likely to work in higher-skilled occupations 10 years later; the estimate for those that *ever* moved to Stockholm is similar. Thus, migrants to Stockholm experience significant occupational skill-upgrading over time, a pattern not observed among migrants to rural areas.

Panel C of Figure 7 shows that while marriage rates increase among rural migrants starting in the early 20s, their migrant sisters residing in Stockholm begin to exhibit modest increases in marriage only about ten years later. Panel D documents a similar trajectory in fertility. When the sisters in the sample have reached their mid-40s, having surpassed the typical childbearing age, differences in marriage and childbearing rates remain substantial.[18]

We then provide complementary evidence indicating that Stockholm migrants have persistently different labor-market and family formation outcomes than other migrants, when allowing for later relocation decisions. Online Appendix Table A.21 studies persistence by examining outcomes in 1910 among those who migrated by 1900, thus allowing migrants to relocate in the subsequent decade. Even after 10 years, migrants to Stockholm are 34 percentage points more likely to be in the labor force and 37 percentage points less likely to be married or have children even a decade later. The estimates are similar when instead considering the effect of *ever* having migrated to Stockholm between 1890 and 1910.[19]

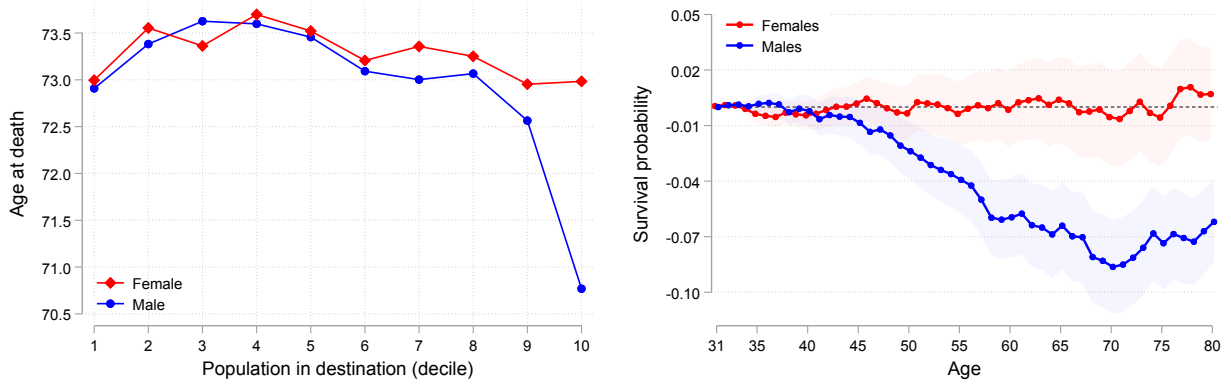
Taken together, these results suggest that substantial differences in labor force participation and family outcomes of Stockholm migrants remain also as women enter the latter part of their prime working age and cannot be fully explained by delayed family formation.[20]

Mortality. Figure 8, Panel A, plots raw data on the average age at death across migrant destinations. The lifespan of female migrants was similar across destinations, while men moving to the largest cities died considerably earlier. Table 2 corroborates this pattern using Equation (4). Column 7 shows no significant difference in age at death between women who migrated to Stockholm and their sisters who moved to rural areas, while column 8 shows

[18] Online Appendix Figure A.9 shows the distribution of age at first child among women living in Stockholm in 1910 showing that virtually no women had their first child after age 40.

[19] The smaller estimates are also consistent with temporary Stockholm migrants reverting towards the outcomes of migrants in other destinations. Online Appendix Table A.22 studies individuals who migrated to Stockholm by 1900 but had left by 1910. Temporary Stockholm migrants are still more likely to work and less likely to be married or have children in 1910 compared to rural migrants, although estimates are considerably smaller.

[20] The lack of convergence shown in Figure 7 is not driven by selective migration away from Stockholm over time, as the pattern is similar when studying individuals who *ever* migrated to Stockholm. Online Appendix Figure A.10 shows that this is the case for all four outcomes.



(A) Lifespan by Migrant Destination

(B) Survival Probability: Stockholm Migrants

Figure 8: Mortality across Migrant Destinations and over the Life Cycle

Notes: This figure shows that male migrants had substantially lower lifespans in large cities (Panel A) and that the survival probability among male migrants to Stockholm declined with age (Panel B). Panel A displays the age at death for migrant men and women in our sample based on the population in their parish of residence in 1910 when migrants are aged 30 to 46. Panel B displays regression coefficients for the likelihood of surviving past ages 31 to 80 in Stockholm relative to rural areas. Each coefficient is from a separate regression with sibling fixed effects and individual controls. See Section 4 for the full list of control variables. Standard errors are clustered at the family level.

that male Stockholm migrants died more than two years earlier than their brothers (see also Online Appendix Figure A.11). Panel B traces survival probabilities over the life cycle, showing that the male survival gap begins to emerge by age 50.

An absence of a mortality effect among female migrants could reflect entry into less hazardous service jobs, or lower fertility reducing the risk of dying in childbirth or related complications. However, the estimates remain similar with detailed occupation fixed effects (Online Appendix Table A.23), and female survival does not diverge during the childbearing years (Figure 8, Panel B) and remains stable among women who likely had completed their fertility by 1910 (Online Appendix Figure A.12).

An alternative explanation is that the gender gap may reflect differences in responses to disease exposure, overcrowding, and public-health conditions (Ager *et al.*, 2024), which may have contributed to the emergence of a female advantage in life expectancy (Goldin and Lleras-Muney, 2019). Lifestyle risks may be a complementary factor: income and mortality were negatively correlated among men but positively correlated among women, partly because of differences in alcohol and tobacco consumption (Dribe and Eriksson, 2025), consistent with the male mortality disadvantage increasing with age.

5.4 Accounting for Women's Formal and Informal Work

Our main focus is female migrants' transition into formal employment and jointly determined family-formation decisions. However, a related question is how migration affects women's economic activity—including informal work—and whether the rise in formal employment solely reflects a shift from informal to formal work. Following the established approach in the literature, we therefore create an imputed proxy for total work by extending our baseline FLFP measure to include women likely to be engaged in informal work, defined as those who live with a male household head (either a father or husband) who is engaged in farming or is a working proprietor in sales or services (Goldin, 1990; Chiswick and Robinson, 2021; Ngai *et al.*, 2024).

Figure 9 presents estimates of Equations (1) and (3) using the proxy for total work as the outcome, which reveals a spatial analogue to the aggregate U-shape: imputed total work is high among migrants to smaller areas where agriculture dominates, gradually decreases among migrants to more populous destinations, and then rises again in the largest cities. In particular, Stockholm migrants experience a 23 percentage point increase in total work relative to migrants to rural destinations (Online Appendix Table A.24), which suggests that economic activity increased substantially and that the increase in formal employment is unlikely to solely reflect a shift from informal to formal work.[21]

At the same time, female migrants to other cities experienced reductions in total work (Online Appendix Table A.24), which corresponds to the bottom of the U-shape in Figure 9. We explore migrant outcomes in specific urban destinations in Online Appendix Figure A.13. Interestingly, migrants to other large cities such as Gothenburg and Malmö exhibit a net zero change in total work. But in smaller cities dominated by industry, migrants tend to experience a decrease in economic activity.[22]

The spatial U-shape shown in Figure 9 is consistent with aggregate trends showing that the downward portion of the U-shape was largely driven by the decline of women's informal agricultural work as they transitioned into industrial communities and towns. The results

[21] Online Appendix Table A.24 provides two additional pieces of evidence supporting an increase in economic activity in Stockholm. First, the estimates are similar when we exclude women with a male household head who is a farmer or working proprietor, thereby restricting the sample to women for whom employment as measured in the census should more closely track total economic activity. Second, FLFP increases remain substantial when migrants to Stockholm are compared with their sisters who moved to other cities. Thus, underenumeration of women's work would have to be substantially greater in other Swedish cities than in Stockholm to account for the observed increase in FLFP.

[22] An instructive example is Eskilstuna, Sweden's most industrial city (Berger and Jensen, 2023). In contrast to other large cities, there is no increase in formal employment among migrants to Eskilstuna (Online Appendix Figure A.5) and there is a substantial decline in imputed activity, as shown in Online Appendix Figure A.13, a pattern consistent with the expansion of industry contributing to a reduction in women's economic activity.

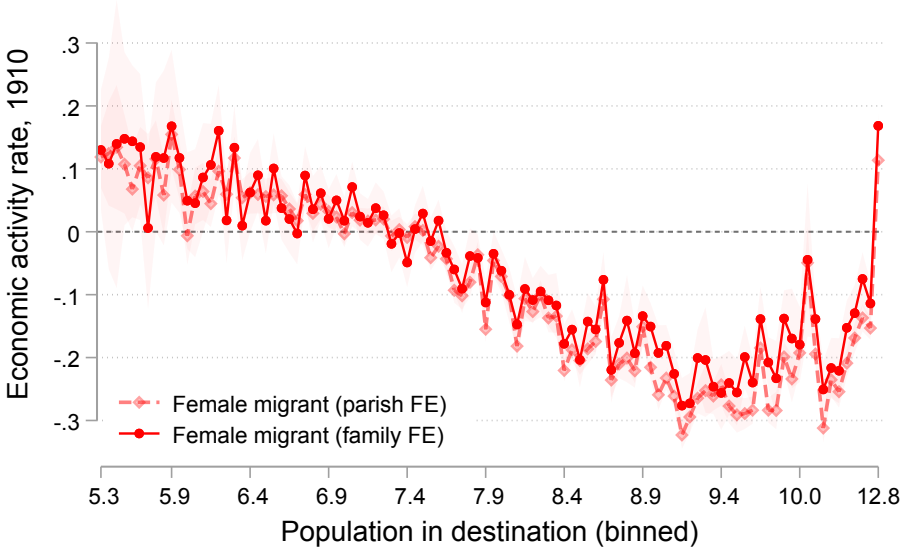


FIGURE 9: TOTAL ECONOMIC ACTIVITY BY MIGRANT DESTINATION

Notes: This figure displays OLS estimates of Equations (1) and (3) using the full sample from rural origins, consisting of females born in rural parishes who have either migrated by 1910 or remained in the parish of origin (the omitted category). The outcome is an indicator taking the value one if an individual is in the labor force in 1910 or is living with a household head (either father or husband) who is either engaged in farming or a working proprietor in sales or services. Destinations are sorted into one hundred bins of equal width in terms of log population in 1910. The figure plots point estimates and 95% confidence intervals associated with moving to a given bin, relative to staying. The x-axis indicates the median destination size in each bin. Panel B presents estimates of equations similar to Equations (2) and (4) where we include separate indicators for migrating to each Swedish city with a population above 20,000 in 1910 and the remaining smaller cities in the sample of migrant sisters from rural origins. The outcome in both panels is an indicator taking the value one if an individual is economically active, as described in the main text. See Section 4 for the full list of control variables. Standard errors are clustered at the family level.

also highlight that moving to large cities that had already undergone the structural shift toward services was associated with higher imputed economic activity, consistent with the literature showing that the upward portion of the aggregate U-shape is largely driven by women's entry into formal service jobs (Goldin, 1990; Olivetti, 2014; Ngai *et al.*, 2024).

5.5 Accounting for Within-Family Sorting across Destinations

This section provides a set of additional estimates to show that within-family sorting across migrant destinations is unlikely to explain our main results.

5.5.1 Testing for Sorting within Families

Our main estimates rely on a sibling-comparison design. While this approach accounts for potential between-family sorting, there may still be sorting within families. Table 1 suggests that within-family sorting is not related to our set of individual controls and that it would need to be sex-specific in order to bias our results. To further assess its importance, we here provide three additional tests. First, we examine whether controlling for *pre-migration* observable differences in FLFP, marriage, and fertility between sisters affects our estimates, which could indicate selection on underlying differences in ability or preferences regarding work and marriage. We focus on the subset of migrants who move after 1900 and control for their pre-migration outcomes in the 1900 census when they are 20–36 years old. Online Appendix Table A.25 shows that including these controls accounts for very little of the estimated effect of migration to Stockholm on FLFP or family formation, suggesting modest sorting based on observables in these dimensions.[23]

Second, a standard Roy model predicts that the strength of migrant selection should be affected by the fixed costs of moving, which are partly shaped by the distance between the origin and destination. Yet Online Appendix Figure A.14 shows that the Stockholm effect on FLFP does not differ by distance to Stockholm, which again indicates limited sorting within families. Next, young adults often chose migration destinations independently, but families may also have strategically influenced sisters to move to particular destinations based on their individual characteristics. The extent of parental involvement likely varied with family context: farming households were more tied to land, larger sibships may have permitted greater individual discretion, the presence of sons could have reduced constraints on daughters' mobility, and emigration may indicate stronger coordination of migration choices. Yet, as shown in Online Appendix Figure A.15, the estimated effect of migrating to Stockholm is highly similar across all these subgroups, further suggesting limited within-family sorting across destinations.

Third, to examine the potential role of sorting based on unobservables, we use the method of Oster (2019). Specifically, we hold constant the family fixed effect and use individual-level controls and lagged outcomes to determine the role of any remaining unobserved *individual* variation within families. Online Appendix Table A.26 displays our results for FLFP, marriage, and fertility. All six models indicate that the bias-corrected estimate is nearly equal to or larger than the estimate based on observable controls. Thus, we find that there is somewhat *negative* selection within families, correspondingly pulling our estimates towards

[23] Online Appendix A.4 presents additional robustness tests showing that our findings are similar when applying twin rather than family fixed effects to account for additional unobserved within-family differences.

zero.[24]

5.5.2 An IV Strategy

To strengthen a causal interpretation of our results, we instrument for women's migration to Stockholm leveraging two sources of variation. First, as shown in columns 1 and 3 of Online Appendix Table B.1, women are more likely to migrate from the childhood parish or county if they have an older sister, as the eldest sister tended to have greater household responsibilities and was more likely to take care of elderly parents. Second, as shown in Online Appendix Figure B.1, those growing up closer to Stockholm more often migrate there later in life, likely due to the lower cost of migration.

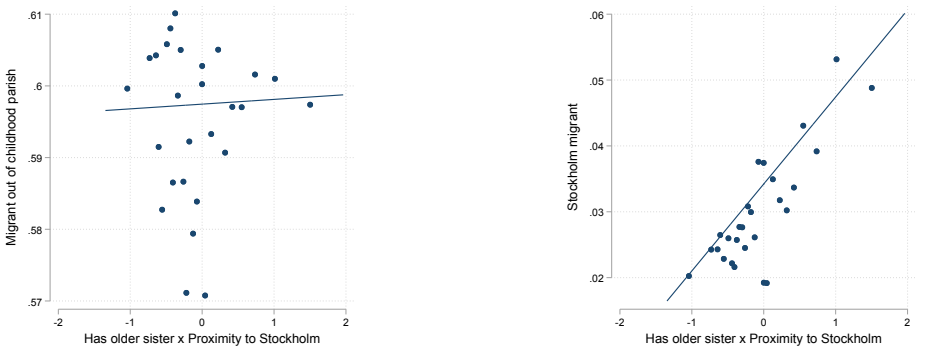
We construct the instrument as the *interaction* between having an older sister and the proximity of the childhood parish to Stockholm, while holding constant the direct effects of both variables. The identifying variation is based on the idea that the marginal effect of having an older sister on migration to Stockholm is larger the closer one's childhood parish is to the capital. Being a younger sister acts as a push factor, while proximity to Stockholm affects the choice of destination. In other words, the strategy compares outcomes between younger and older sisters at different distances from Stockholm. Because identification relies on within-parish variation, we can include parish fixed effects that flexibly control for proximity to Stockholm and hold constant all local factors that may influence either migration or second-stage outcomes.

The first-stage equation, estimated on the full sample of women from rural origins, is:

$$\begin{aligned} Sthlm\ Migrant_{ip} = &\beta_1\ Has\ Older\ Sister_i \times Sthlm\ Proximity_p + \\ &\beta_2\ Has\ Older\ Sister_i + \gamma \mathbf{X}_i + \phi_p + \varepsilon_{ip}, \end{aligned} \tag{5}$$

where $Sthlm\ Migrant_{ip}$ is an indicator for individual i from parish p living in Stockholm in 1910, $Has\ Older\ Sister_i$ indicates that the individual has an older sister, $Sthlm\ Proximity_p$ is defined as minus the log of distance from the childhood parish to Stockholm, and the single instrument is the interaction term $Has\ Older\ Sister_i \times Sthlm\ Proximity_p$. To control for potentially confounding family dynamics related to sibling gender, we include fixed effects for individual birth order, birth year, and number of siblings in $\mathbf{X}_i$. We also include the

[24] Computations are made using the parameter $\tilde{R} = 1.3R$ following Oster (2019), where $\tilde{R}$ is the assumed maximum R that would be explained by a model including all variables, both observed and unobserved, and R is the observed R^2. Observed and unobserved variables are assumed to have the same impact on outcomes, $\delta = 1$. Using the sample of migrants after 1900, which allows us to add pre-migration lagged outcomes for employment, marriage and childbearing, we find a similar pattern. The corrected estimate in column 2 is 56.8 percentage points, which can be compared to the baseline estimate of 51.6.



(A) Any migration (B) Migration to Stockholm

Figure 10: The Instrument Predicts Migration to Stockholm but Not Overall Migration

Notes: This figure shows the relationship between the instrument and an indicator for migrating out of the childhood parish (Panel A) and migrating to Stockholm (Panel B) by 1910. Graphs are produced using *binsreg* with 50 bins (Cattaneo *et al.*, 2024). Values of the instrument above the 99th percentile are excluded for expositional reasons.

same set of individual and family controls as in Equation (1). All models include childhood parish fixed effects, ϕ_p. Standard errors are clustered at the level of the childhood parish.

The gender of older siblings is, in principle, as good as randomly assigned conditional on birth order. Online Appendix B provides several balance tests of the instrument as well as a placebo instrument based on older brothers, showing little correlation with covariates from Equation (1).

Exclusion Restriction. The key identifying assumption is that the instrument satisfies the exclusion restriction: the instrument should only affect second-stage outcomes by raising the propensity to migrate to Stockholm, conditional on the set of controls. An important requirement for this to hold is that norms regarding migration of younger sisters should not depend on the proximity to Stockholm. For example, if younger sisters who grow up closer to Stockholm have more freedom to migrate than those growing up farther away, the instrument would capture variation in overall migration, rather than migration *destination* as intended. We test for this in Panel A of Figure 10, which shows no relationship between the instrument and an indicator of having left the childhood parish by 1910.[25]

IV Estimates. Panel B of Figure 10 illustrates the first-stage relationship, with observations revealing a clear positive association across the full range of the instrument. Column

[25] Online Appendix Table B.1 provides corresponding regression results for migrating out of the childhood parish or county of birth, showing no significant association.

TABLE 3: IV RESULTS

Dependent variable:	Sthlm migrant	In labor force	Married	Any child
Panel A: Main results	OLS	IV	IV	IV
	(1)	(2)	(3)	(4)
Prox to Sthlm × Has older sister	0.012***			
	(0.002)			
Stockholm (=1)		0.432**	-0.491**	-0.302
		(0.174)	(0.202)	(0.210)
First-stage F-statistic		43.6	43.6	43.6
Panel B: Placebo instrument	OLS	OLS	OLS	OLS
Prox to Sthlm × Has older sister	0.012***	0.006**	-0.006**	-0.004
	(0.002)	(0.002)	(0.003)	(0.003)
Prox to Sthlm × Has older brother	0.003*	-0.003	0.001	-0.000
	(0.002)	(0.002)	(0.003)	(0.003)
Observations	274711	274711	274711	274711
Mean outcome	0.036	0.177	0.693	0.698

Notes: OLS and IV regressions using the full sample from rural origins. Panel A displays first-stage (column 1) and second-stage results (columns 2–4). Panel B displays reduced-form results for the main and placebo instruments. The instrument is defined as the interaction between having an older sister and childhood parish proximity to Stockholm. The placebo instrument is constructed using older brothers instead of older sisters. All models include an indicator for having an older sister (Panels A and B), having an older brother (Panel B), as well as fixed effects for birth order, birth year, number of siblings, having a disability, and childhood parish. The following family controls are also included: father's income score percentile, family size, as well as fixed effects for mother's employment, father's 1-digit HISCO occupation, and whether the household is multigenerational, extended family (relatives only), or composite family (with non-relatives). Standard errors, in parentheses, are clustered at the childhood parish level. *** - $p < 0.01$, ** - $p < 0.05$, * - $p < 0.1$.

1 of Panel A in Table 3 confirms a strong and statistically significant first-stage at the 1% level. The estimates imply that growing up 200 kilometers closer to Stockholm raises the likelihood of migration by 1.3 percentage points for those with an older sister, a sizable increase relative to the baseline migration rate of 3.6%.

Column 2 of Table 3 reports IV estimates indicating that migration to Stockholm increases FLFP by 43.2 percentage points, which can be compared to the estimate in Table 1 showing an increase of 49.6 percentage points.[26] The strong first stage is reflected in the F-statistic of 43.6. For family outcomes, columns 3 and 4 show a corresponding decrease in the marriage probability of 49.1 percentage points and an insignificant decrease in childbearing by 30.2 percentage points. Together, the IV results for FLFP and marriage are in line with the OLS estimates obtained using the sibling design, although the relationship between

[26]The corresponding OLS estimate using the same sample as in column 2 is 51.5 percentage points.

migration and childbearing is smaller in magnitude and less precisely estimated.[27]

Placebo and Exclusion Restriction Tests. Parents with strong gender preferences may influence the gender composition of their children, potentially biasing estimates. To assess this possibility, we implement a placebo test that uses an alternative instrument based on having an older *brother* rather than an older sister. If the original instrument is valid, the placebo should have little or no effect, as migration should primarily be driven by older sisters. Panel B of Table 3 reports the first-stage and reduced-form estimates on the main outcomes. Reassuringly, the older-brother placebo shows near-zero associations with the main outcomes and a small, marginally significant relationship with migration.[28]

Online Appendix Section B provides several further placebo, robustness, and exclusion restriction tests. The placebo tests indicate that we only find meaningful effects when (i) defining the instrument using older sisters (rather than older brothers) and (ii) using the sample of females (rather than males), which aligns with the hypothesized mechanism of increased migration to Stockholm and is difficult to reconcile with unobserved confounders driving results. The remainder of Online Appendix Section B shows that results do not depend on proximity to other towns, birth order, or family characteristics and are robust to dropping very remote parishes.

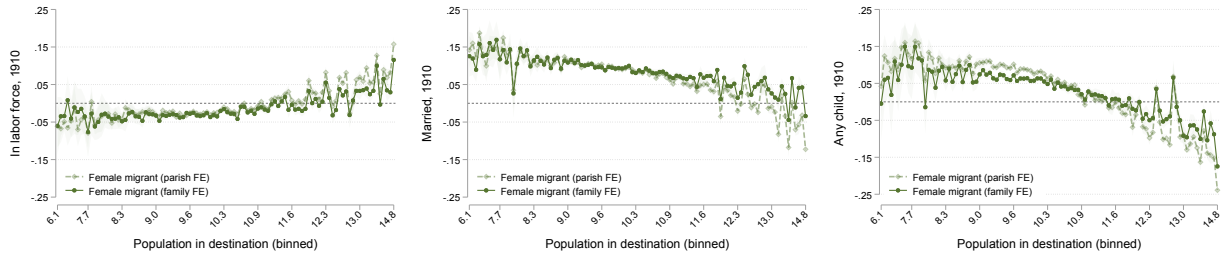
6 External Validity: Evidence from U.S. Migrants

Our findings show that women moving to large Swedish cities saw substantial increases in FLFP and reductions in family formation. Yet it is an open question whether these findings generalize to other contexts. We next replicate our results using linked U.S. census data showing that the main findings are also evident in the United States.

Data. We use links from the Census Tree project that recently has made substantial progress in linking women across the decennial U.S. censuses (Buckles *et al.*, 2025). The Census Tree draws millions of handmade links by genealogists, which are used to train ML models and generate additional links. To make the U.S. data more comparable with our Swedish data, we focus on women linked between the 1880 and 1910 censuses obtained from

[27] We provide additional results in Online Appendix Section B. In Online Appendix Table B.4, we use an indicator for *ever* having migrated to Stockholm as the endogenous variable, with results in line with those for ever-migration discussed in Section 5.1 and Table A.21. IV estimates for sector of work, skills, income and health are presented in Online Appendix Table B.5, with results that are similarly consistent with previous estimates.

[28] Moreover, Column 2 of Online Appendix Table B.6 shows that the IV estimates slightly increase when including the placebo instrument as a control.



(A) In labor force (B) Married (C) Any child

Figure 11: Employment and Family Formation by Population in U.S. Migrant Destinations

Notes: This figure displays OLS estimates of Equations (1) and (3) using the sample of U.S. women consisting of native-born white women born in rural locations who have either migrated by 1910 or remained in their county of origin (the omitted category). The outcomes are indicators that take the value one if a woman is in the labor force (Panel A), married (Panel B), or has a child (Panel C) in 1910, respectively. Destinations are sorted into one hundred bins of equal width in terms of log population in 1910. The figure plots point estimates and 95% confidence intervals associated with moving to a given bin, relative to staying. The x-axis indicates the median destination size in each bin. The three smallest bins are wider to reduce noise. Dashed shaded lines denote a specification using origin county fixed effects as well as individual-level controls (fixed effects for birth year, birth order, and an indicator for being the eldest sister), while solid lines denote estimates that include individual-level controls and family fixed effects. Standard errors are clustered at the family level.

Ruggles *et al.* (2024, 2025b) and restrict the sample to native-born White women that are aged 0–16 and reside in rural areas in 1880. The resulting dataset allows us to observe U.S. women and their sisters, where we observe the same main economic and demographic outcomes as in our Swedish sample.

Empirical Strategy. We first estimate Equations (1) and (3) and compare women in the U.S. that grew up in rural areas and that subsequently migrated by 1910 to stayers. The regressions include individual controls (fixed effects for birth year, birth order, and an indicator for being the eldest sister) and either county of origin or family fixed effects, so that the estimates reflect differences relative to women in the county of origin or stayer sisters. We then estimate the equivalent of Equation (4) that uses a sibling design and examine the outcomes for sisters that moved to large and small cities relative to their migrant sisters moving to rural areas. See Section 4 for more details.

Main Results. Figure 11 displays estimates of Equations (1) and (3) using the linked U.S. 1880–1910 census sample showing the effect of migration on FLFP by population of the destination county, relative to stayers. Migrants experience substantial increases in FLFP when moving to the most populous counties, while women moving to smaller counties are less

TABLE 4: U.S. MIGRANTS' ECONOMIC AND DEMOGRAPHIC OUTCOMES BY DESTINATION

Dependent variable:	Labor force participation			Occupational skill		Income score	Family formation	
	In labor force	In services	In industry	High skill	Low skill	ln(Income)	Married	Any child
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migrant: large city (=1)	0.094***	0.079***	0.029***	0.052***	0.044***	0.120***	-0.103***	-0.167***
	(0.004)	(0.004)	(0.002)	(0.003)	(0.003)	(0.033)	(0.004)	(0.005)
Migrant: small city (=1)	0.051***	0.038***	0.026***	0.025***	0.025***	0.094***	-0.060***	-0.097***
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)	(0.021)	(0.002)	(0.003)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sibling fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	556946	556946	556946	556946	556946	21444	556946	556946
Mean outcome	0.151	0.080	0.033	0.077	0.057	2.735	0.845	0.672

Notes: OLS regressions. All outcomes are measured in 1910. *Migrant: large city* is an indicator taking the value 1 if the individual lives in one of the 15 largest U.S. cities by population in 1910, and zero if not. *Migrant: small city* is an indicator taking the value 1 if the individual lives in a city other than the 15 largest in 1910, and zero if not. *Individual controls* include fixed effects for birth year and birth order, and an indicator for eldest sister. *Family fixed effects* are fixed effects for same-sex siblings. Standard errors, in parentheses, are clustered at the 1880 household level. *** - $p < 0.01$, ** - $p < 0.05$, * - $p < 0.1$.

likely to transition into the formal labor market compared to their stayer sisters. Notably, the migration-induced gains in FLFP are driven by destinations at the top of the population distribution in the U.S., similar to the case of Sweden (see Figure 4).

Table 4 presents estimates similar to Equation (4) where we compare outcomes for migrants to "large" and "small" U.S. cities relative to migrants moving to rural destinations.[29] Column 1 shows that U.S. migrants to large cities experienced a 9.4 percentage point increase in FLFP compared to rural migrants, which can be compared with about a 5.2 percentage point increase for migrants moving to a smaller city.[30]

An increase in FLFP among U.S. migrants can partly be ascribed to a greater transition into formal service jobs. Column 2 of Table 4 shows that a migrant is significantly more likely to be observed in a service job, also relative to the increased probability of being employed in manufacturing (column 3).[31] Columns 4 and 5 show that migrants to larger cities saw increases in employment both in high- and low-skill jobs, while column 6 uses data on occupational income scores showing that the subset of female migrants that held an occupation in 1910 were employed in occupations that on average paid more than those held

[29] To define large cities, we rank all U.S. cities in the 1910 census based on their population and select the 15 largest cities, a cutoff that approximately lines up with the population size of Stockholm in 1910.

[30] We show in Online Appendix Table C.1 that the results are robust to excluding farm households that could inflate the effect of moving to a city given the underenumeration of informal work at family farms (Goldin, 1990; Chiswick and Robinson, 2021), as well as to using alternative linkage methods (Online Appendix Table C.6).

[31] Online Appendix Figure C.2 presents separate estimates for the 15 largest cities.

by their sisters.[32]

Figure 11, Panels B and C, show that female migrants were typically more likely to marry and have children compared to their stayer sisters, while those that moved to the largest places were less likely to either marry or have a child. The final two columns of Table 4 confirm this interpretation showing that U.S. migrants to the largest cities were substantially less likely to both marry and have children compared to migrants to smaller cities, or the countryside.

Discussion: U.S. vs. Sweden. Our estimates for U.S. female migrants are qualitatively similar to our Swedish results, but also suggest that the effect of moving to a large American city was smaller than moving to Stockholm. Although direct comparisons should be made with care given differences in underlying data and linkage methods, it is informative to note that the relative increase in FLFP that is attributable to an increased entry into service jobs is broadly similar among migrants to Stockholm and large U.S. cities.[33] Thus, the key question is why U.S. migrants entered service jobs at lower rates than migrants in Stockholm.

A potential explanation is that urban service jobs differed in their accessibility and social acceptability for women.[34] As described in Section 2, low-skill service jobs—for example, in domestic and personal services—in Stockholm heavily relied on women from rural origins. Such jobs constituted respectable employment and were often seen as a natural part of the life cycle for rural women (Edvinsson and Söderberg, 2010). By contrast, many low-skill service jobs were segmented by race, nativity, and ethnicity in the United States: jobs within domestic services were disproportionately held by Black and immigrant women, reflecting discrimination in alternative employment and the stigma attached to domestic service among native-born White women (Stigler, 1946; Ward, 2026; Withrow, 2026). Consistent with this view, the estimated effects of migration to large cities in the U.S. are substantially larger among immigrant (Online Appendix Table C.4) and Black women (Online Appendix Table C.5) compared to the native-born White women in our main sample both in terms of FLFP and employment in services.[35]

[32] A similar result is obtained if one instead uses the LIDO score developed by Saavedra and Twinam (2020) that accounts for differences in income across genders.

[33] Based on the estimates reported in Table 1, Panel A, column 6, and Table 2, column 1, for migrants to Stockholm and Table 4 for migrants to large U.S. cities, the share of the increase in FLFP that can be accounted for by an increased entry into service jobs is $0.424/0.496 = 0.855$ in Sweden and $0.079/0.094 = 0.840$ in the United States.

[34] A complementary and more mechanical explanation is differences in sex ratios: in 1910, the census estimated about 1,223 women per 1,000 men in Stockholm, which contrasts with the situation in most major U.S. cities that were either characterized by a sex balance or a skew towards males due to immigration. Consequently, a larger share of women had to remain single and in the labor market in Stockholm.

[35] A related question is whether the U.S. estimates may conceal differences in cultural or social norms across places. However, the estimates are broadly similar when examining women originating from different

Together, these results suggest that our main finding that women moving to large cities experienced increases in FLFP and reductions in marriage due to an entry into service jobs can be generalized across historical settings. But the different magnitudes in the U.S. and Sweden also highlight that social norms around women's work may have constrained migrants' entry into the formal labor market, consistent with the argument that changing norms contributed to the aggregate rise of FLFP in the twentieth century (Fernández *et al.*, 2004; Fogli and Veldkamp, 2011; Fernández, 2013).

7 Conclusion

Our paper provides the first systematic evidence that women who moved to large cities in Sweden and the U.S. were substantially more likely to enter the formal labor market and remain unmarried. Entry into formal work was facilitated by the early shift toward the service sector in large cities, which occurred up to half a century before similar shifts took place in smaller towns and rural areas. That the same patterns emerge in two countries with starkly different cultures, institutions, and urbanization patterns suggests that the transformative role of large cities in expanding women's economic opportunities may have been a general phenomenon of early twentieth-century Europe and the United States.

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regions, including the Midwest where most Swedish emigrants settled (see Online Appendix Table C.2 and C.3).

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