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ABSTRACT

A combination of changing migration patterns and US immigration restrictions acted to shift the male-female balance in many ethnic groups in the early 20th Century. I use this variation to study the consequences of changing sex ratios for the children of immigrants. Immigrant sex ratios affected the second generation for a number of reasons, most importantly because immigrants and their children typically married in the same ethnic group. The results suggest that higher sex ratios, defined as the number of men per woman, had a large positive impact on the likelihood of female marriage. More surprisingly, second-generation male marriage rates were also an increasing function of immigrant sex ratios. The results also suggest that higher sex ratios raised male earnings and the incomes of parents with young children. The interpretation of these findings is complicated by changes in extended family structure associated with changing sex ratios. On balance, however, the results are consistent with theories where higher sex ratios increase male competition for women in the marriage market.

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"There's a shortage of men, so [the men] think, 'I can have more than one woman. I'm gonna go around to this one or that one, and I'm gonna have two or three of them."

(A single Philadelphia mother describes her local marriage market; quoted in Edin, 2000).

"Every day I meet someone better. I am waiting for the best."

(A female Moroccan immigrant describes her local marriage market; quoted in Rodriguez, 2000).

Marriage is widely seen as the key to economic success and social welfare for both individuals and communities. Observers such as Fukuyama (1993) credit traditional family values for the economic progress of America's immigrant groups, while Moynihan's (1965) landmark study of the black family attributed the plight of the underclass to single parenting and the lack of nuclear families. Consistent with this view, micro-econometric studies show a robust positive association between marital status and male earnings (see, e.g., Schoeni, 1995), while Akerlof (1998) and others have suggested that declining marriage rates among men are responsible for crime and a variety of social pathologies. Similarly, divorce and single parenting are important correlates of female and child poverty (see, e.g., McLanahan and Sandefur, 1994).

A powerful force affecting marriage is the relative supply of men and women. For this reason, the consequences of changing sex ratios, commonly defined as the number of men per woman, have long interested economists and other social scientists. Becker's (1973, 1974) theoretical studies of marriage discussed the consequences of variation in sex ratios for marriage rates. His analysis suggests that increasing sex ratios increase the likelihood of marriage for women and reduce it for men. More recently, Wilson (1987) argued that low sex ratios are part of a cycle of teen childbearing by black women and low employment rates for black men. Heer and Grossbard-Shechtman (1981), Guttentag and Secord (1983), and Grossbard-Shechtman (1984) outlined the controversial but complementary thesis that high sex ratios shift the demand curve for women. The increased competition for mates, according to this view, may lead men to marry more quickly and increase male investment in their children.

Anecdotal and quantitative evidence on the relationship between sex ratios and marriage rates does indeed suggest a strong link. Guttentag and Secord (1983) recount a number of historical episodes when sex ratios were high, typified by the story of an observer who noted that in male-dominated colonial America,

lack of a dowry was no handicap for any woman seeking marriage and that "even female servants had excellent prospects". Early empirical studies linking sex ratios with marriage rates include Groves and Ogburn's (1928) analysis of 1920 Census data for US cities, Cox (1940), who looked at the connection between sex ratios and marriage for blacks in the 1930 Census, and Freiden's (1974) analysis of 1960 Census data.[2] The consequences of changing sex ratios in the developing world have also received attention; an example is Rao (1973), who documents a negative relationship between dowries and the relative supply of men. Of course, high sex ratios need not be a stabilizing force that benefits women or society in general. Societies with high sex ratios may face the prospect of accommodating large numbers of bachelors. Ridley (1993, p. 128) suggests this may lead to "rape, lawlessness, and a general frontier mentality," while, George Bernard Shaw, quoted in Becker (1974, p. S20) argued that the consequences of too many bachelors would be no less than violent revolution, a scenario that clearly does not bode well for economies or families.

Studies of the consequences of changing sex ratios must contend with the fact that the human sex ratio at birth is reasonably stable at about 1.04 men per woman, an observation that goes back to R.A. Fisher (1930). Although substantial deviations from this ratio have been reported, the interpretation of abnormal sex ratios at birth is disputed (see, e.g., Sieff, 1990). On the other hand, virtual sex ratios -- the number of men available and *likely* to marry a given woman -- deviate considerably from 104. For example, because men tend to marry younger women, growing populations experience a "marriage squeeze" (Shoen, 1983). In practice, however, the major forces determining adult sex ratios are behavioral and not biological or demographic. An especially important and potentially exogenous source of behavioral variation in adult sex ratios is sex-biased migration. Since migrants tend to be male, communities with a preponderance of immigrants are typically characterized by high sex ratios.

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[2]Other references include South and Lloyd (1992) and South and Trent (1988). Grossbard-Shectman (1985, 1993) studies sex ratios, marriage rates, and female labor supply in US cities. Chiappori, Fortin, and Lacroix (1998) look at the link between sex ratios and labor supply across cities for couples in the PSID. A recent US News and World Report (Koerner, 1999) cover story notes the decline in sex ratios on many college campuses and discusses social and economic consequences.

In this paper, I use migration-induced variation to study the consequences of changing sex ratios for the children of immigrants in the first half of the 20th century. In particular, I explore the consequences of changing sex ratios for marriage rates and for economic outcomes like employment and wages that are affected by changes in the marriage market. A number of characteristics make the second generation group an attractive population for the study of these questions. First, in 1910, almost 40% of Whites were of "foreign stock", i.e. foreign-born (16 percent), or of foreign or mixed parentage (23 percent) (Hutchinson, 1956). So immigrants and their children were a keystone in the demographic foundation of the modern American population. Second, sex ratios in the marriage market faced by the second generation were buffeted by new arrivals of immigrants from the same ethnic groups. Since endogamous marriages accounted for over half of unions in most groups, variation in the proportion of male migrants had a significant effect on marriage prospects for the adult children of immigrants. Finally, the resulting variation in sex ratios was driven at least partly by exogenous home-country conditions and changes in US immigration law.

In addition to shedding light on general questions about the determinants and consequences of marriage, the experience of the second generation is of intrinsic interest. By 1970, most descendants of the early 20th Century immigrant cohorts had assimilated, with family income levels above the overall national average (Sowell, 1981). What accounts for this progress? Why did some groups advance more quickly than others? From the legend of the melting pot to the contemporary rise of multi-culturalism, the assimilation story has featured prominently in American life, even as the debate over which factors contributed most to the success of different groups continues (see, e.g., Borjas, 1999). The results reported here suggest that moderately high sex ratios strengthened family structure and contributed to the economic success of immigrant groups. This finding has implications for US immigration policy, which continues to favor the extended family members of those already here over unattached men seeking work.

I. Immigration and Sex Ratios: 1880-1930

Almost 28 million immigrants came to the US in the 50 years beginning in 1880. Arrival rates crested in the 1880s, and then peaked again with a wave of 15 million immigrants arriving in the first two decades of the 20th Century (US Department of Labor, 1930). The majority of the "new immigrants" in this second wave were processed at Ellis Island, which opened in 1891. The era of mass immigration ended abruptly in 1924, when immigration was cut-off, and net migration rates were negative during some depression years. The primary source countries shifted between the first and second immigration peaks. Most immigrants in the 1880s came from Central and Northern Europe, especially Germany, Britain, Ireland, and Sweden, as well as Canada. Immigrants arriving between 1900 and 1920 came mainly from Southern and Eastern European nations, especially Italy, Russia, Austria, and Hungary, with continued arrivals from Britain and Canada (Dinnerstein and Reimers, 1975).[3]

The laws ending open immigration in the 1920s reflected the triumph of anti-immigration and isolationist sentiment after World War I, though organized anti-immigration movements date back at least to the Know-Nothing Party in the 1850s. In the late 19th century, selective immigration restrictions were imposed, notably the Chinese Exclusion Act of 1882, while the 1907 "Gentleman's Agreement" effectively banned immigration from Japan. The first major piece of legislation affecting European immigrants was the 1917 literacy test, which requiring reading ability in any language and excluded specific groups, most importantly, immigrants from Asia. The literacy test was easily overcome, however, and the 1917 law appears to have had only a modest effect on Europeans (Briggs, 1984; Goldin, 1994).

Effective restrictions on European immigration were imposed in 1921, when Congress established the first immigration quotas. The 1921 law set up a comprehensive system of national-origin quotas allowing immigration rates equal to 3% of each nationality's population in the 1910 Census and limiting total

[3]The first great wave of immigrants arrived between 1820 and 1860, and came primarily from Britain, Ireland, and Germany.

European immigration to 358,000. This was soon followed by the 1924 Johnson-Reed Act, which set quotas at 2% of nationality populations in the 1890 Census. Although a 1927 modification of Johnson-Reed introduced a national-origins provision that set quotas using 1920 Census counts, total European immigration was still capped at about 150,000. The 1924 Act is generally viewed as having ended the era of mass immigration, and the quota system for non-refugees was not substantially revised until 1965. After 1924, however, immediate family members of US citizens (including immigrants), as well as some refugee groups, could obtain immigrant visas.

The statistical analysis that follows uses the 1910, 1920, and 1940 Census IPUMS data sets (Ruggles and Sobek, 1997) to estimate the impact of changing immigrant sex ratios on economic and social conditions for the children of those already here. The immigrants in my extract arrived mainly between 1900 and 1924, but the sample includes second generation respondents whose parents came earlier. Throughout the mass migration era, immigrants to the US were disproportionately male, with average sex ratios from 1820-1920 estimated at about 1.5 (Hutchinson, 1956). Sex ratios declined toward the end of this period, however, and after 1930 were much lower (see, e.g., Tyree and Donato, 1985). Because endogamous marriage was widespread (see, e.g., Pagnini and Morgan, 1990), these changes had a marked impact on marriage prospects in both the first and second generations.

Changes in immigrant sex ratios between 1910 and 1930 reflected a number of factors, but US immigration policy was probably the most important. In particular, Hutchinson (1956, p. 18) notes that the quota acts of the early 1920s were a major force changing the sex ratios of the foreign born. Before quota restrictions were imposed, immigrants in most groups were disproportionately male. In addition to cutting the flow of men arriving alone, immigration quotas granted preference to family members, thereby favoring female relatives in ethnic groups where male immigrants had established a beachhead in the New World. Immigrants admitted as refugees were also more likely to come in balanced sex ratios. The quota acts therefore induced exogenous variation in both the number and sex-composition of new arrivals.

Other sources of variation in immigrant sex ratios were home country conditions, intended duration of stay, and US work opportunities. Irish immigrants were disproportionately female, partly because English-speaking Irish women found ready employment as domestics. Immigrant groups with the possibility and desire for return migration tended to be disproportionately male; a leading example is the Southern Italians, who were also likely to repatriate money to family members left behind. Others, such as Russian Jews, were unlikely to want or to be able to return, and moved as families.[4] Finally, the Great Depression reduced the number of single men looking for work after 1929, though the refugee flow picked up after 1935 with the rise of European fascism. Since work-seeking and return migration were especially likely to be jointly determined with economic and demographic outcomes, I use 1899-1929 arrivals data as an instrument for ambient sex ratios among the foreign born. I also report results from a number of specification checks in an attempt to substantiate the causal interpretation of sex ratio effects.

II. Data and Descriptive Statistics

A. The IPMUS Samples

The data used here come from the 1910, 1920, and 1940 Census IPUMS files (Ruggles and Sobek, 1997). The 1920 Census contributes the most observations to the extract since this is a 1-in-100 sample. The 1910 IPUMS data set is a 1-in-250-file, while sample-line (long-form) respondents from the 1940 Census constitute an approximate 1-in-330 sample. A number of variables have been recoded in the IPUMS to increase comparability across census years. The 1910-1940 Census files are among the more similar in the IPUMS data set, though some economic variables in the 1940 data set still differ importantly from similarly-named variables in 1910 and 1920 (Ruggles, 1991).

The analysis sample pools micro data on the second generation with information on sex ratios in the

[4]For a theoretical treatment of the decision to immigrate with or without family members, see Borjas and Bronars (1991).

first generation. The second-generation samples include men aged 20-35 and women aged 18-33, the age groups where marriage rates are highest. Children of married couples in these age groups are also highly likely to be living with their parents and therefore observed in the same household. This facilitates an analysis of children's outcomes later. The sample design is summarized below:

		Sex Ratios	
Sex	Second generation age group	Marriage partners in the first generation	Marriage competitors in the first generation
Women	18-33	men 20-35	women 18-33
Men	20-35	women 18-33	men 20-35

First generation sex ratios were constructed by dividing the number of men aged 20-35 by the number of women aged 18-33 for each ethnic group and year.[5]

The ethnic groups in the sample were chosen to match to the largest turn-of-the-century immigrant groups. My coding of these groups is based on Pagnini and Morgan (1990, p. 407), with the addition of Mexicans, many of whom arrived after the revolution of 1917. The resulting ethnic groups are: British, Irish, Italian, Canadian, Mexican, Nordic countries (Scandinavia plus Iceland), German-Austrian, Hungarian-Romanian, Russian-Polish, Central and Eastern European Jews, plus a residual category for non-natives not elsewhere classified. The German-Austrian, Hungarian-Romanian, and Russian-Polish groups exclude Jews, who are lumped together regardless of country of origin. An appendix provides a more detailed description

[5]The sample age groups are staggered because men tend to marry older women. The expected age at first marriage was about 23 for women and 26 for men in 1920 (Haines, 1996). I used a two-year age gap to calculate sex ratios to reduce the likelihood of including individuals from the parents' generation in the marriage pool. With a two year age gap, the oldest man in the sex ratio sample, aged 35, is 17 years older than the youngest woman, aged 18, in the second generation sample.

of how the ethnic groups were coded.

Descriptive statistics for first and second generation respondents, as well as natives the same age, are shown in Table 1. The second generation columns include statistics for those of both dual foreign and mixed foreign parentage. Over 40 percent of the 1910 and 1920 samples were of "foreign stock", i.e., foreign born or second generation. This fell to about 30 percent in 1940.

Men in every group and year were less likely to be married than women. The table also shows marked differences in marriage rates by nativity. In 1910, only 47 percent of second generation women aged 18-33 were married while 59 percent of native women were married. Female marriage rates in all groups increased later, but remained lower for the second generation than for natives or the foreign born. Low marriage rates in the second generation have been noted previously by, among others, Groves and Ogburn (1928), Haines (1996) and Landale and Tolnay (1993).[6] Also noteworthy is the prevalence of extended households for the US born. This can be seen in the high proportion of men and women in the native and second generation samples still living with their mothers. Single children, especially daughters, were much less likely to leave home in the first half of the 20th Century than they are today.

Economic variables in the extract include labor-force status and imputed income based on occupation codes . The imputed income variable was constructed from a regression relating median 1950 income by occupation to wage and salary earnings in the 1940 Census, when both variables are available.[7] The labor force status variable indicates whether the respondent reports an occupation. This corresponds to the

[6]A comparison of first generation marriage rates in 1920 with second generation marriage rates in 1940 also shows low marriage rates for the children of immigrants.

[7]The imputation is from a regression of wage and salary earnings in 1940 (the only 1940 income variable) on the IPUMS variable OCCSCORE, which assigns median 1950 income to all occupation codes. OCCSCORE and a consistent 1950 occupation code are available for every census, though total personal income is only available beginning in 1950. Wages are imputed for everyone in the labor force, included those with no wage and salary income. The imputation regressions were run separately by sex, included a full set of age dummies, and allowed the relationship between OCCSCORE and actual wages to vary across three broad age groups. Borjas (1994) used a similar imputed wage measure in his analysis of 1910 Census data.

definition of labor force participation used in the 1910 and 1920 Censuses.[8] In addition to these two individual-level variables, I also constructed a family income score by summing the imputed income of everyone aged 14-69 in the same family. This includes the income of both spouses, plus that of any children or elderly parents in the household. Of course, this measure fails to reflect the true extent of family income pooling. Tentler (1981) discusses the home economy in this period, and notes that working daughters transferred almost all wages to their mothers. Working sons, in contrast, were more likely to keep part of their wages, paying for room and board once they were adults.

Labor force participation rates and income scores were much lower for women than for men in every year in the sample, though many young women worked during this period. The bulk of female labor force participation was by unmarried women, and married women typically quit their jobs or were fired as a consequence of explicit or understood marriage bars (Goldin, 1990).

Imputed income was higher for immigrants than for natives, but this reflects the fact that immigrants were much less likely than natives to work in agriculture, and more likely to live in big cities and the relatively high-wage Northeast and Midwest. Adjusting for these characteristics shows immigrants with a clear income disadvantage, though smaller than the wage gap reported by Borjas (1994) for an older sample in 1910. The fact that the children of immigrants had higher income than natives is not explained by occupation, region of residence, or age differences. Chiswick (1977) similarly found a modest earnings advantage for second generation men in 1970 Census data.

The ethnicity and sex distribution of the foreign stock are described in Table 2 for the sample of men and women aged 18-35. Statistics for this young group are not representative of all immigrants, but they capture the make-up of recent arrivals. The largest immigrant group in the 1910 sample was the German/Austrians. In 1920, the Russian/Polish group was largest, while in 1940, the Canadians were most numerous among young immigrants. Combining the Russian/Polish group with the Jews, most of whom

[8]The 1940 census included a more modern labor force question, but this does not match the variable used in earlier years. In practice, the two measures of participation in 1940 are almost identical.

were Russian, produces the largest group in 1910 and 1920.[9] Thus, the Eastern Europeans and Italians came to outnumber the veteran groups from Germany and Austria, Nordic countries, and the UK in this period. Not surprisingly, the ethnicity distribution in the second generation is more persistent than the ethnicity distribution of immigrants, though by 1940, Italians made up the largest second-generation group. An important factor affecting the number and ethnicity mix of immigrants in 1920 was World War I, which reduced the flow from most combatant countries from 1914 to 1919, but probably increased it immediately after.

Sex ratios by ethnicity reflect the fact immigrants in most groups were disproportionately male, though there is marked variation across groups and over time. For example, Italian immigrants were predominantly male, while Irish immigrants were disproportionately female. All immigrant groups except the Irish and Canadians were predominantly male in 1910 and 1920. On the other hand, between 1910 and 1940, immigrant sex ratios declined for every ethnic group except the Irish, so that by 1940 sex ratios in many immigrant groups were close to, or even below, 1.

The decline in immigrant sex ratios partly reflects the impact of the quota acts. These acts:

> "granted quota preferences or nonquota status to relatives of immigrants residing in the United States, favored a higher proportion of females among new arrivals; and immigration during the refugee period became more a movement of family groups and less a movement of males seeking employment." (Hutchinson, 1956, p. 18).

Thus, in addition to the fact that men arrived first, migration of family groups favored women since co-residence and dependency rates were higher for women than men. The Great Depression also contributed to a decline in sex ratios for those arriving after 1929. Fewer unattached men came to seek work and some of those already here returned home. The fact that sex ratios in 1940 actually fell below 1 for some groups partly reflects this return migration. Arrivals data (discussed in more detail in the appendix) show more

[9]First generation Jews are those who listed Yiddish as mother tongue and second generation Jews are those who listed Yiddish as mothers' mother tongue. Rosenthal (1975) argues that all US immigrants of Russian descent can be treated as Jewish. On the other hand, while some Jews may not have listed Yiddish as mother tongue, this identification seems capture a degree of religious identify or affinity.

balanced sex ratios for the 1920-1929 period than the 1940 Census, with ratios above 1 in all but three groups, and the lowest ratio at .83. This suggests the arrivals data are more likely to reflect exogenous variation than the ambient sex ratio.

B. Marital Status and Endogamy by Nativity

Tables 3 provides a closer look at differences in marriage rates by nativity. The table reports coefficients from regressions of ever-married status on dummies indicating foreign born and second-generation respondents, with natives the omitted group. The second-generation effect is allowed to differ according to whether the respondent had one or both parents foreign. The regressions used to construct the estimates included a full set of age dummies and were estimated separately by sex.

The estimates in Table 3 show that marriage was 12-14 percent less likely for second generation women than for native women, and 10-12 percent less likely for second generation men than for native men. The second generation effects are somewhat larger for men of dual foreign parentage in every sample year, and for women of dual foreign parentage in 1940. The estimates also indicate that foreign born men were less likely to have married than native men, while foreign born women were less likely than natives to have been married in 1940 and more likely to have been married in 1910 and 1920. A comparison of the foreign born and second generation coefficients shows the first-generation/second-generation marriage gap was consistently larger for women than for men.

Second generation marriage rates were undoubtedly reduced by widespread poverty in poor immigrant families. But a more important factor affecting marriage patterns was probably endogamy; that is, the fact that men and women tended to marry in the same ethnic group. The importance of endogamy is documented in Table 4, which reports the fraction of married men and women who had married natives, married foreign stock in the same ethnic group, and married other foreign stock. The distribution of marriage by type is given separately for each nativity group.

The first row of Table 4 shows that 85 percent of natives married other natives. In contrast, the

proportion marrying natives was much lower in every second generation ethnic group, and lower still among the foreign born. Endogamy in the first generation was partly due to the fact that many immigrants arrived married. But endogamy in the second generation reflects strong preferences for within-group marriage. Over 85 percent of Italian and Jewish women in the second generation married in the same group, and within-group marriage was common even among the children of English-speaking immigrants from Ireland and the UK. For example, only 53 percent of second generation British women married natives. The table also illustrates the fact that within-group marriage was typically more common for second-generation women than second-generation men. Endogamous marriage rates for women exceed those for men by at least two percentage points in every second-generation group except the British, Irish, Canadians, and Nordic. Among the foreign born, however, endogamy was about equally likely for men and women.

Endogamy probably contributed to low marriage rates in the second generation through a simple scale effect. Search and matching processes, whether in the labor market or the marriage market, seem likely to exhibit increasing returns to scale.[10] To see this, contrast an imaginary population of two men and two women entertaining marriage proposals with an imaginary population of 100 men and 100 women. Suppose that same types marry, there are two types, and that populations are drawn at random from a larger pool with half of each type. There is a substantial probability no one is matched in the smaller population, while most will find matches in the larger population (for this reason, presumably, young singles like to live in big cities). Limiting the search for mates to individuals from the same ethnic group therefore reduces the probability of finding a mate. A related factor that also contributed to low marriage rates among second generation women is the fact that second-generation men were more likely to marry natives than second generation women. This "leakage" out of the second-generation pool reduced the number of potential partners for second-generation women.

[10]See, e.g., the discussion and references in Blanchard and Diamond (1992).

III. Sex-Ratio Effects on Adults

A. Empirical framework

The empirical strategy exploits changes in immigrant sex ratios between 1910 and 1940, focusing on the effects of this variation on the second generation. Underlying this research design is the notion that the children of immigrants faced an ethnic environment shaped in part by the arrival of immigrants after they were born. Much of this variation was due to home country conditions and the impact of American immigration quotas. I look at sex ratio effects on the second generation instead of on the immigrants themselves because the sex ratio of new arrivals should be less strongly correlated with unobserved factors for those born in the US.[11] Of course, older people in the first generation are the parents of the second generation, and conditions affecting parents may affect children. For this reason, I use sex ratios for immigrants that were too young to be the parents of second generation men and women under 35. As a partial check on the estimates, I also explore strategies that control for first generation sex ratios in older age groups.

Because the size of immigrant flows was changing at the same time that immigrant sex ratios were changing, the empirical model controls for the number of immigrants in each group, as well as for year and ethnicity effects. The estimating equation for second-generation individual i, in ethnic group j, observed in census year t, is:

$$y_{ijt} = X_i'\gamma_0 + \alpha R_{jt} + \beta \, ln N_{jt} + \gamma_{at} + \delta_j + \varepsilon_{ijt}, \qquad (1)$$

where foreign-born sex ratios, R_{jt}, and immigrant counts, N_{jt}, vary by ethnicity and year. The covariates X_i include a pair of dummies indicating type of mixed parentage (mother-only, father-only), γ_{at} is an age effect for each census year, and δ_j is an ethnicity effect. The list of dependent variables, denoted y_{ijt}, includes

[11] Borjas (1993) explores the effect of home country conditions on economic outcomes for the second generation. His cross-section estimates show a relationship, but this disappears once demographic characteristics or average wages by ethnicity in the parents generation are included in the model. Using more recent data, Borjas (1998) finds home country effects are largely absorbed by ethnicity fixed effects.

demographic and economic outcomes such as marital status, labor force participation, and income.

The variable R_{jt} is the ratio of the number of men aged 20-35 to the number of women aged 18-33 by year and ethnicity group, and $ln N_{jt}$ is the log of the total number of immigrants in these age groups. I also explore a specification where these variables are calculated for the foreign stock instead of for the foreign born. In both specifications, the parameterization in (1) can be rationalized by postulating a production function that aggregates the number of men and women in the marriage pool into a single causal factor affecting outcomes. The production function links sex ratios directly to outcomes, side-stepping the need to derive effects from separate coefficients on numbers of male and female immigrants.

To describe this model further, let p_{jt} be the proportion of men among immigrants from ethnic group j in year t in the relevant age groups, and note that $R_{jt} = p_{jt}/(1-p_{jt})$. Suppose that the size and sex composition of immigrant flows interact to produce marriages and other outcomes through a single variable, Z_{jt}, defined as follows:

$$Z_{jt} \equiv ln(f[p_{jt}, N_{jt}]) = ln(f^{*}[p_{jt}N_{jt}, (1-p_{jt})N_{jt}]).$$

Finally, suppose that the function, f, is given by

$$f[p_{jt}, N_{jt}] = \theta_j R_{jt}^{\varphi} N_{jt}^{\psi}. \qquad (2)$$

This allows for constant returns to scale in matching (as in Berman, 1997) or increasing returns.[12] Because $\log(R_{jct}) \approx R_{jt} - 1$ (with the approximation exact at $p_{jt}=.5$), the Cobb-Douglas formulation is equivalent to model (1).

Figure 1 provides a first look at one of the key relationships to be estimated. For the sample of women aged 18-33, the figure plots the relationship between the proportion ever married by ethnicity and year and N_{jt}. The figure plots residuals from regressions of sex ratios and marriage rates on ethnicity and

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[12] A more flexible but still linear specification allows the number of men and women to have separate effects instead of a single coefficient on the sex ratio. Suppose

$$ln f^{*}[p_{jt}N_{jt}, (1-p_{jct})N_{jt}] = \varphi_m \ln(p_{jt}) + \varphi_w \ln((1-p_{jt})) + \psi \ln(N_{jt}).$$

The three regressors in this formulation are conceptually distinct, but their effects cannot be separately determined in practice (similar to age, period, and cohort effects). Imposing the restriction $\varphi_m = -\varphi_w \equiv \varphi$ leads to (2).

year effects, and the total number of immigrants in the ethnicity-year cell. This is a visual representation of equation (1), though cells with fewer than 500 observations were not plotted. The figure shows a well-defined relationship with a slope of about .15, suggesting that a one-standard deviation increase in the sex ratio (about .3) would have raised the proportion married by 4.5 percentage points.

The measure of R_{jt} used to generate the figure comes from the sex distribution of immigrants in the Census. This "ambient sex ratio" is subject to measurement error and may have been be affected by return migration, as well as immigrant arrivals. Return migration seems likely to be more responsive to local (US) economic conditions than immigrant arrivals.[13] To reduce the likelihood of bias from measurement error or economic and socially-motivated return migration, I computed instrumental variables (IV) estimates as well as OLS estimates of the effect of sex ratios. The instrumental variables set-up treats R_{jt} and $ln N_{jt}$ as endogenous in equation (1), with instruments derived from information on the numbers of men and women who arrived each year from 1900-1929. These data were taken primarily from Willcox (1929a), who tabulated immigrant aliens admitted by sex, year, and race or national background. The data appendix discusses the scheme used to match the Willcox data with census data.

The first-stage equations used to construct the IV estimates can be described as follows. Let n_{jt} denote the number of arrivals in ethnicity group j in the 10 years preceding t for which data are available (1890-1909 for the 1910 Census, 1910-1919 for the 1920 Census, and 1920-29 for the 1940 Census).[14] Let r_{jt} denote the sex ratio among arrivals in ethnicity group j in the same period. The IV procedure treats both sex ratios and immigrant counts as endogenous, so the first stages are:

$$R_{i,jt} = X_i'\pi_{10} + r_{jt}\pi_{11} + n_{jt}\pi_{12} + \mu^r_{at} + \mu^r_j + \eta_{ijt} \quad (3a)$$

$$N_{i,jt} = X_i'\pi_{20} + r_{jt}\pi_{21} + n_{jt}\pi_{22} + \mu^n_{at} + \mu^n_j + \nu_{ijt}, \quad (3b)$$

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[13]Willcox (1929b, p. 91) estimated that roughly 3/4 of immigrants arriving between 1890 and 1920 were permanent. Borjas and Bratsberg (1994) analyze return migration using the 1980 Census.

[14]Since few immigrants arrived in the 1930s, sex ratios of the foreign born in 1940 will have been determined primarily by arrivals in the 1920s. Note that most of these arrivals came after those in the corresponding second generation sample were born.

where an "i" subscript has been added to the endogenous variables as a reminder that these relationships are estimated in individual data, even though the endogenous regressors vary only by ethnicity group and year.[15]

The first stage is illustrated in Figure 2, which plots the census sex ratio by ethnicity and year against the arrivals sex ratio derived from Willcox (1929a). As before, the plot shows residuals from regressions on the other covariates in (3a), so the figure provides a visual representation of the coefficient on r_{jt}. The slope of the line in the figure is .53. The points farthest from the line are for Mexican immigrants; the fit is otherwise very good.

A complete set of first stage estimates is presented in Panel A of Table 5. The table shows estimates of both (3a) and (3b), corresponding to the two endogenous variables, R_{jt} and $ln N_{jt}$. There are two excluded instruments in each equation, the arrivals ratio and the immigrant count. The first four columns of the table report estimates of models where the census sex ratio and immigrant count are for the foreign born, while columns 5-8 show comparable estimates using analogous variables for the foreign stock. Not surprisingly, the arrivals data are more highly correlated with the characteristics of the foreign-born than with the characteristics of the foreign stock. For example, estimates computed using micro data for women show that a .1 increase in the arrivals ratio would have increased the foreign born sex ratios by .053, while the same change would have increased the foreign stock sex ratio by .036.

Panel B of Table 5 reports a set of first-stage estimates for an older cohort composed of women aged 34-48 and men aged 36-50. These estimates provide a check on whether the arrivals measures are most strongly correlated with the size and sex composition of the younger, more "marriage-prone" age group. The estimates confirm that the association between the characteristics of arrivals and the foreign born population is much weaker for the older cohort. Sex ratio effects on the older cohort are less than half as large as for the younger cohort, while the relationship between numbers of arrivals and the size of the foreign-born population is less than one-quarter the size of the corresponding effect on younger cohorts.

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[15]Standard errors were corrected for j,t clustering using the formula in Moulton (1986).

B. OLS and IV Estimates

The OLS estimates for women suggest that increasing sex ratios had a modest but precisely measured effect on marriage probabilities. This can be seen in Panel A of Table 6, which reports estimates for the effect of sex ratios on variables describing family structure. An increase in sex ratios from 1 to 1.25 (the sample mean for immigrants) is predicted to have raised the probability of marriage by a little over 3 percentage points, or about 6 percent of the average marriage rate in the sample. Other OLS estimates in the table show that sex ratios had slightly smaller effects on childbearing and the probability of living in an extended household (as measured by an indicator for maternal co-residence). Family size is also predicted to decline as sex ratios increase, probably because extended households were larger than households formed by the newly married.

As noted earlier, OLS estimates of sex ratio effects are potentially biased by measurement error and return migration. In practice, the 2SLS estimates of sex ratio effects in Panel A of Table 6 are mostly close to the OLS estimates, though generally somewhat larger. One noteworthy difference between 2SLS and OLS in this context is the fact that the 2SLS estimates of immigration-size effects are almost all smaller than OLS and in many cases insignificant. This is important, because weak immigration effects suggest that it really is the sex ratio that "does the work" in equation (1).

Columns (4) and (5) in the table report estimates of an alternative model where variables for the foreign stock replace variables for the foreign born. This specification is motivated by the assumption that the marriage market is unified for all foreign stock of a given ethnicity. Most of the variation in foreign stock sex ratios comes from variation for the foreign born, but the two measures are not identical. OLS estimates of the effects of foreign stock sex ratios are larger than the corresponding OLS estimates of the effect of foreign born sex ratios. Because the first stage effects on the foreign stock sex ratio are smaller than the corresponding effects on the foreign born sex ratio, the 2SLS estimates of the effect of foreign-stock sex ratios are also necessarily larger. The differences across columns are not dramatic, however, and the choice of endogenous variable is not key for the interpretation of results.

Sex ratios affected economic outcomes for women, probably as a secondary consequence of the relationship between sex ratios and marriage. This is documented in Panel B of Table 6, which reports estimates of effects on labor-force status and measures of individual and family income. Both the OLS and 2SLS estimates show a well-determined negative association between sex ratios and labor force participation, about 2/3 the size of the effects on marriage. The participation effects are likely explained by the fact that women in this period typically left work when they married (Goldin, 1990). It should be noted, however, that some of the apparent labor-force effect is almost certainly due to a reluctance among married women to report they were working.[16] Sex ratios are similarly associated with lower individual incomes for women, though effects on log wages are small and mostly insignificant.

The remaining income variables describe economic conditions for couples and families. The first, spouses income score, is the amount of income a woman received from her husband. This equals zero for women without a spouse present (whether married or not), and can be thought of as measuring the increase in the probability of marriage times average spouse income. The fact that sex ratios are associated with an increase in the combined husband and wife income score, a result also reported in the table, indicates that the income contribution from husbands more than offset the decline in women's earnings caused by marriage.

Another interesting result in Table 6 is the strong negative association between sex ratios and total family income. This is likely explained by the fact that many newly married women set up their own households, though other family composition effects may have played a role. The notion that family composition effects are behind the decline in family income is supported by the result showing no relationship between sex ratios and family income per person aged 14-69 (these are the people whose income was counted to compute the family income score). The negative relationship between sex ratios and family size in Panel A is also consistent with a change-in-marital-status explanation for the family income effects. The reduction in adult family size is larger than the reduction in total family size, probably because the

[16]Goldin (2000) notes that labor-force participation rates among married women before 1940 were almost certainly higher than reported, though still very low.

reduction in total size was moderated by an increase in childbearing among newly married women. Other factors connecting sex ratios and family structure are discussed following a review of the results for men.

Table 7 shows positive effects on marriage rates for men, though they are much smaller than the marriage effects for women. The OLS estimates of the effect of sex ratios on male marriage rates are not significant, but the corresponding 2SLS estimates show a significant .036 increase in the probability men had ever married. Models that treat the foreign stock sex ratio as endogenous generate a 2SLS estimate of .048 for the effect of sex ratios on the probability men ever married. The effects on the likelihood living with own-children are of a slightly smaller magnitude, suggesting they might be explained by the marriage effects.

The positive association between sex ratios and marriage rates for women is likely explained by the increased availability of potential mates. A positive relationship between sex ratios and male marriage probabilities is more surprising, however, since an increase in the number of men could have led to a shortage of potential spouses. It is important to note, however, that roughly half of the men and the women in the age groups studied here were not married. It therefore seems likely that the number of potential spouses generated fewer constraints than potential spouses' behavior and intentions.

In contrast with the estimated effects on women's economic outcomes, Panel B of Table 7 shows no relationship between sex ratios and male labor force status or individual income. This is not surprising given the small effects on male marriage rates in Panel A. On the other hand, there is a small, marginally significant (at the 10 percent level) positive association between sex ratios and log wages. This suggests that men may have obtained or retained better jobs when sex ratios were higher. The wage effect, on the order of 3-4 percent, is probably too large to be explained by changes in marital status alone. This increase in wages may nevertheless reflect greater investment in education or on-the-job training when conditions in the marriage market became more competitive.

C. Other Changes in Family Structure

In addition to small effects on marriage, childbearing, and wages, Table 7 shows that sex ratios

are correlated with other indicators of family structure for men. Increasing sex ratios reduced the probability of maternal co-residence, though the estimate of this effect is less precise and considerably smaller than the corresponding estimate for women. Sex ratios are also negatively correlated with men's family size and family income, and positively correlated with the likelihood that male respondents were heads of household. The negative effects on total family size for men exceed those for women, probably because for women, reductions in the number of co-resident adult family members were offset by increases in the number of children due to higher marital fertility. Effects on the number of co-resident family members aged 14-69 are negative and similar in magnitude for men and women.

The effects of sex ratios on male marriage rates are too small to account for the changes in family structure associated with increasing sex ratios. This suggests that first generation sex ratios affected the family environment for reasons other than respondents' own marriage prospects. An additional channel for sex ratio effects on men is the fact that changes in female marital status would have been experienced by second generation men through co-resident sisters and aunts. For example, changes in female marital status would have pulled sisters and aunts out of extended families into smaller households, reducing everyone's average family size, and providing additional opportunities for family co-residence and male headship outside the parents' household.

A second factor linking first-generation sex ratios and family structure is the difference in the extended-family co-residence propensities of men and women. Women generally had higher co-residence propensities than men, and sex differences in co-residence propensities were especially large for unmarried sisters (Ruggles, 1987). Thus, declining sex ratios would have increased the proportion of immigrants likely to join established households with a first generation head. Reinforcing this is the fact that declining sex ratios were caused in part by immigration policies that favored the relatives (both male and female) of those already here. Finally, the addition of (mostly male) unrelated boarders may have increased the opportunity cost of co-residence for male children who could support themselves in independent living arrangements. Ruggles (1987) and others have noted that boarders were commonly found in extended-family households

during this period.

The potential links between first-generation sex ratios and family composition are summarized in the kin diagram in Figure 3. Those outside the dotted vertical lines in the figure were most likely to have moved into or out of the household as a consequence of changing sex ratios. The household head is a 50-year old first-generation man, married to a first generation woman age 48. They have three (second-generation) children, including a daughter age 27 who married a 29 year old of the same foreign stock. This second generation couple has a (third generation) child age 5. The couple and child, co-residing with the first generation head in the first years after marriage, will likely form their own household. Also present in the household is the head's unmarried sister, age 40, and the wife's father, aged 71, who immigrated with the head's wife and is now widowed.[17] The head's parents are still abroad. Increasing sex ratios act on the links in the figure as follows: (a) the second generation marriage will ultimately remove adults from the household, affecting men and women about equally, but adds a third generation child, increasing family size, especially for women; (b) the likelihood of first-generation parents and siblings entering the household falls. This reduces family size, and, again, probably affects second generation men and women about equally. Finally, the unrelated boarder, aged 35, may eventually displace the 25 year old unmarried son.

The association between sex ratios and family size raises the question of whether sex ratio effects on economic outcomes were due solely to changes in the marriage market. One possible direct consequence of smaller families may have been a reduced economic burden on first-generation heads and spouses. On the other hand, the extended family members affected by sex ratios were mostly working, so their presence in the household could have been a plus. In any case, however, changes in numbers of co-resident siblings and aunts and uncles seem unlikely to have had lasting economic consequences for the second generation, especially once the latter left the head's family. This view is supported by the fact that income per-working-age family member is not associated with sex ratios for either women or men. In contrast, the two income

[17]Ruggles (1994) estimated that in 1910, 12 percent of white households included elderly kin.

variables directly linked to marital status, the spouse and couples' income scores, show a strong relationship with sex ratios. It is also worth noting that while the modest positive effect of sex ratios on log wages for men may be due to a selection effect associated with male-biased migration, Borjas (1990) found that those who immigrated as part of a family unit (i.e., in an environment characterized by low sex ratios) were more skilled and had higher earnings than persons who migrated on their own.

D. Specification Checks

If sex ratios affected outcomes primarily through the marriage market, instead of, say, unrelated changes in household composition, sex ratio effects should be larger where endogamy is more important. A simple check on the marriage-market thesis can therefore be had by interacting the sex ratio with group-specific endogamy rates. This strategy leads to an equation of the form

$$y_{ijt} = X_i'\gamma_1 + \alpha_{10}R_{jt} + \alpha_{11}R_{jt}m_j + \beta_1 ln N_{jt} + \gamma_{at} + \delta_j + \varepsilon_{ijt}, \quad (4)$$

where m_j is the proportion of endogamous marriages in ethnic group j in the 1910 Census. The estimation in this case uses only the 1920 and 1940 Censuses since endogamous marriage is an outcome that was potentially affected by sex ratios. The effect of sex ratios at the mean endogamy rate is $\alpha_{10} + \alpha_{11}\bar{m}_j$, where $\bar{m}_j$ is the proportion of second generation respondents married to someone from the same (first or second generation) ethnic group *in the 1910 Census* (.45 for women and .42 for men).[18]

Most of the results for women support the notion that the magnitude of sex ratio effects is an increasing function of endogamy rates. This can be seen in Table 8, which reports estimates of α_{10}, α_{11}, and the effect at the mean. OLS and 2SLS estimates of α_{11} for effects on marriage are positive and significant, while the interaction terms for maternal co-residence, effects on labor force participation, and individual income, are negative and significant. The interaction terms in models for couple income are positive, as is the effect at the mean. One difference between results from models with interaction terms and those without

[18]Endogamy rates are defined as the probability of marriage to a person from the same ethnic group, conditional on being married, with spouse present.

is that while the earlier results for this outcome were negative, the interaction term for the effect on family income is positive.

For men, OLS estimates of models with endogamy interactions show no relationship between sex ratios and marriage. But 2SLS estimates of the same relationship show a marginally significant positive interaction term. This echoes the difference between the OLS and 2SLS results for male marriage rates in Table 7. The 2SLS estimate of the interaction term for effects on living with own children (not reported in the table) is also positive and significant, suggesting that this outcome too is related to the impact of high sex ratios on the marriage market. Interestingly, the 2SLS estimate of the interaction term for effects on male labor supply is also positive and significant, so that increasing sex ratios are predicted to increase labor force participation when endogamy rates are high. On the other hand, there is no significant effect of sex ratios on log wages in these models.

Another check on the marriage-market interpretation of Tables 6 and 7 looks at whether sex ratio effects are largest when the ratios are defined for those in the marriage-prone years. The idea here is that household composition and other effects are likely to have been at least as strong for those too old to provide mates for men and women in the sample age group. To implement this idea, I added sex ratios for an older generation of first-born men and women to equation (1). This can be thought of as controlling for sex ratios in the parents' generation. The estimating equation for OLS becomes:

$$y_{ijt} = X_i'\gamma_2 + \alpha_{21}R_{jt} + \beta_{21}lnN_{jt} + \alpha_{20}R_{0jt} + \beta_{20}lnN_{0jt} + \gamma_{at} + \delta_j + \varepsilon_{ijt}, \quad (5)$$

where R_{0jt} and lnN_{0jt} are sex ratios and log immigrant counts for foreign born respondents who were 20 years older than the respondents in the second-generation sample. That is, R_{0jt} is the ratio of foreign-born men aged 40-55 to foreign-born women aged 48-53, and N_{0jt} is the number of men and women in these age groups.

The 2SLS version of this strategy is based on a similar modification of (3a) and (3b), though variables for the older group were treated as exogenous since there are not enough instruments to treat variables for both generations as endogenous. This is a drawback since ambient sex ratios and immigrant counts in older age groups are probably no less endogenous than those in the younger group. It should also

be noted that the youngest men and women in the older group were only 7 years older than the oldest men and women in the younger group. The separation of generations is therefore imperfect. Still, we might expect the effects of sex ratios in the younger group to be stronger than those for the older group if the marriage-market is really the prime factor linking sex ratios with outcomes other than family size.

The estimates in Panel A of Table 9 support the view that marriage-related factors provided the most important links between sex ratios and outcomes for women. OLS and 2SLS estimates of the effect of own-generation sex ratios on marriage rates are significant and similar in magnitude to those in Table 6, while parents-generation sex ratios have smaller, marginally significant, negative effects. Own-generation effects on labor force participation and women's' occupational income score are also negative, though smaller than before. Again, however, the own-generation effects are much larger in magnitude than the parents' generation effects. The own-generation effect on combined husband and wife income scores is significant and similar to that in Table 6, while the corresponding parents' generation effect is negative and insignificant. The estimated effects on per-capita family income scores are negative and insignificant for both sex ratio variables.

As a further check along these lines, Table 9 also reports results from a model where own-generation and parents' generation sex ratios were entered in logs instead of levels. The levels parameterization was motivated as an approximation to equation (2). Although equations with untransformed regressors can be interpreted more directly, this choice of functional form may matter for attempts to distinguish the effects of highly correlated and conceptually related variables for different generations. In practice, the results from models with logged ratios, reported in columns 5-8 of Table 9, shows estimates for women that are larger than those from models in levels, but otherwise differ little. For comparability with the results in levels, estimates from log models should be divided by the average sex ratio (about 1.25). After this adjustment, the log estimates are still larger than the corresponding levels estimates, but the pattern of signs and the relationship across outcomes is similar to that in the first four columns.

The results of estimating equation (5) in the sample of second generation men, reported in Panel B

of Table 9, are less clear-cut than the results for women. OLS estimates of the effect of own-generation sex ratios on ever-married status are smaller than the OLS estimates of effects of parents' generation sex ratios. 2SLS estimation of the same relationship leads to own-generation effects that are larger than the corresponding parents' generation effects, but the parents' generation effects are still positive and significantly different from zero. On the other hand, 2SLS estimates of models with log sex ratios, reported in columns 7 and 8, show large, significant, and positive own-generation effects on marriage, with no significant parents' generation effects. Thus, 2SLS results from the log model support that notion that only own-generation sex ratios matter for men's marital status.

The estimates for men show effects of both own- and parents-generation sex ratios on maternal co-residence that are all negative and mostly insignificant. Similarly, neither own- or parents' generation estimates of the effect of sex ratios on the probability male respondents were household heads are significantly different from zero, though the largest are the 2SLS estimates of the effect of own generation sex ratios in columns 3 and 7.

Estimates of the relationship between sex ratios and male labor force participation are imprecise, with the relative importance of own- and parents'-generation effects changing across specifications. On the other hand, both OLS and 2SLS generate at least marginally significant positive estimates of the effects of own-generation sex ratios on the occupational income score and the combined husband and wife income score. The table also shows positive though less precise estimates of own-generation effects on log wages. Consistent with the marriage-market story, the estimates suggest either no relationship or a negative relationship between parents' generation sex ratios and these three economic outcomes. Finally, OLS estimates show some evidence of a positive relationship between own-generation sex ratios and the per-capita family income score, while parents' generation sex ratios are predicted to reduce family income. The corresponding 2SLS estimates of the own-generation effect on per-capita family income are smaller or not significant, however. OLS and 2SLS estimates of own-generation effects on the total family income score (not reported in the table) are larger in magnitude, i.e., more negative, than the corresponding parents-

generation effects.

On balance, the results in Table 9 lend support to the hypothesis that own-generation sex ratios matter more than parents' generation sex ratios for women, a result consistent with causal mechanisms that operate primarily through changes in the marriage market. The estimates suggests some parents-generation effects on male marriage, though this could be rationalized by a spillover impact of older men on the younger marriage market. Economic outcomes for men are also much more strongly associated with own-generation sex ratios than with parents' generation sex ratios, though again, these effects are probably too large to be explained by changes in individual marital status alone.

A last set of specification checks, not reported here, incorporated interaction terms in two further variations on OLS estimation of equation (1). The first allowed the sex ratio coefficient to interact with the proportion foreign born by state and ethnicity. Because new arrivals tend to locate in cities with an established immigrant population, the effect of sex ratios on an ethnic group might be expected to be larger in states with many immigrants from the same group (though the impact of a given number of new arrivals is also diluted in this case). These results tend to show larger effects in states with a higher proportion foreign born, though the estimates are not precise.

The second variation used mixed-parentage families as a control for those with both parents foreign born. This was implemented by allowing sex ratio effects to vary according to whether a second generation respondent had a foreign born father, a foreign born mother, or both parents foreign born. These results showed a clear pattern for women, with the largest effects on those with both parents foreign, and the smallest effects on those with a foreign born father only. As in Table 9, however, the results of allowing sex ratio effects to vary by nativity were less clear-cut for men than for women. The effects on marriage and male headship were largest for those with both parents foreign born. In some cases, however, such as for log wages, the estimates for men with a foreign father only were as large or larger than the results for men with both parents foreign. This may be because endogamy preferences for sons were mostly determined by

fathers, while endogamy preferences for daughters were mostly determined by mothers. It should be noted, however, that most of the comparisons by nativity group were not statistically meaningful.

IV. Results for the Third Generation

The estimates for women suggest that higher sex ratios led to higher marriage rates and higher income for couples. The results also suggest that working men may have earned more when sex ratios were high. On the other hand, the spousal income that accrued to married women was partly offset by the loss of female earnings associated with marriage, and by the fact that family income fell when newly married couples formed their own households. Thus, the relationship between first generation sex ratios and second generation standards of living may have been negative, at least in the short run. What were the consequences of changing sex ratios for the third generation, children of the second?

Efforts to assess the causal effect of changing sex ratios on the third generation are complicated by the fact that childbearing is a consequence of a process of family formation itself shaped by the impact of sex ratios. Any association between sex ratios and child outcomes may be due to the fact that different types of children were born when sex ratios changed, or because those who were born were treated differently by their parents. High sex ratios would have reduced average child welfare if, for example, they led women with lower human capital to marry and give birth. This is a pure selection effect, similar to that considered in Levitt and Donohue's (1999) study of the impact of changing abortion laws on the socioeconomic characteristics of birth cohorts. On the other hand, high sex ratios may have reduced divorce rates for the same reason they increased marriage rates. This is a causal effect that likely would have benefitted children. The net social consequences of both selection and causal effects are of interest, however, even if they cannot be disentangled.

To measure the net effect of changing first-generation sex ratios on the third generation, I re-estimated equation (1) weighting by two measures of the number of own children living with each second-

generation woman. One weighting scheme counts the number of children under age 5, while the other counts children of all ages. Woman without co-resident children were automatically dropped from the weighted sample, while women living with children contributed as many observations as they have children in the relevant age range. The estimates therefore capture effects on children, as reflected in the living conditions of their parents.[19] In this setup, estimates for women become estimates of effects on mothers, estimates for spouses become estimates of effects on fathers, and estimates for couples capture effects on parents.

Children under 5 from a high-sex-ratio ethnic background were more likely to be living with a married mother and their mothers had lower earnings, though neither of these effects is significantly different from zero. This can be seen in Table 10, which reports the results from child-weighted estimation of equations (1)-(3). The most striking results in the table are the positive and significant associations between sex ratios and father's income score, parent's income score, and per-capita family income. This suggests that young children born to parents from a high-sex-ratio environment were economically better off. It is also worth noting that, as in Tables 6 and 7, the sex ratio matters more than the number of immigrants for economic variables.

The pattern of results changes little when total number of children are used as weights instead of the number of children under age 5. The most important difference is that the negative effects of sex ratios on mothers' labor force participation become larger, with a corresponding reduction in mothers' income and parents income. The effects of sex ratios on fathers' income scores and per-capita family income are almost unchanged. Overall, the estimates in Table 10 support the view that high immigrant sex ratios had small but lasting effects on the economic well-being of children and families, though the results fail to distinguish selection effects from the consequences of changes in parents' behavior. The magnitudes are such that a one standard deviation increase in sex ratios is predicted to have increased parental income by about 1.5 percent.

[19]Statistical inference is based on numbers of mothers and not numbers of children.

V. Summary and Conclusions

Estimates linking sex ratios and marriage rates date back at least to Groves and Ogburn (1928). Previous empirical work, however, has paid little attention to problems of reverse causality and has not explored many of the economic and social consequences of changing sex ratios. Imbalanced sex ratios among immigrants provide an opportunity to measure the causal effect of sex ratios on the children of immigrants. Estimates using variation among immigrant groups provide strong evidence for a reduced-form relationship between sex ratios and a range of characteristics related to second generation family structure and economic circumstances. Higher sex ratios are associated with higher marriage rates for both men and women, lower female labor force participation, and higher spouse and couple income. Results for the third generation suggest that children born to parents who married in a high sex ratio environment were better off. A number of specification checks for women support the notion that the primary factor mediating these links was the marriage market, while the results for men lend mixed support to this view. The analysis covers many outcomes, and the estimates for men are less precise than those for women, so perhaps it is not surprising that there are some anomalies.

The findings reported here can be seen as supporting the thesis that high sex ratios reinforce traditional family structure by increasing marriage rates and increasing the effort men devote towards attracting and retaining a spouse. This in turn leads to improved economic outcomes for families. In future work, I hope to identify sources of exogenous variation that can be used to provide direct evidence on the consequences of changing sex ratios for contemporary groups. The results also support the view that nuclear family structure was a factor contributing to the economic success of immigrants. An unintended consequence of US immigration policy, which reduced sex ratios after 1921, may have been delayed marriage, weaker family structure, and lower incomes in many ethnic groups.

DATA APPENDIX

A. Ethnicity in the Census

The following 10 groups plus an 11th "not elsewhere classified" category were coded as follows:

1= British (from England, Scotland, or Wales)
2= Irish, including Northern Ireland
3= Italian (From North or South; mostly Southern)
4= Canadian (From English-speaking or French Canada; mostly French)
5= Mexican (largely refugees from civil war and revolution)
6= Nordic (From Denmark, Finland, Norway, Sweden, or Iceland)
7= German/Austrian (from Germany or Austria, and other ethnic Germans; excluding Jews)
8= Hungarian/Romanian (from Hungary or Romania; excluding Jews)
9= Russian/Polish (from USSR or Russian empire, including Baltic States, from Poland, and other ethnic Poles; excluding Jews)
10= Central and East-European Jews (Jews from the German/Austrian, Hungarian/Romanian, or Russian/Polish groups)
11= Not elsewhere classified (N.E.C.)

This coding scheme was used for both first generation (foreign born) and second generation (foreign and mixed parentage) respondents. In most cases, the ethnicity of the foreign born was assigned by country of birth, while the ethnicity of the second generation was assigned using mother's country of birth, except for those with a foreign father only, in which father's ethnicity was used. Exceptions to these general rules are that in 1910 and 1920, ethnic Germans and ethnic Poles were identified using mother tongue for the foreign born and mother's mother tongue for the second generation. First and second generation Jews in 1910 and 1920 were similarly identified as those listing Yiddish as mother tongue or mother's mother tongue. In 1940, ethnic Germans, ethnic Poles, and Jews were identified using mother tongue for both the foreign born and the second generation because the 1940 Census omits information on parents' mother tongue. The coding change in 1940 mostly affects the distinction between Jews and other Russians and Poles.

Although national boundaries changed over the sample period, the underlying ethnicity and nativity variables were recoded in the IPUMS to use a consistent scheme for all years. Every Census from 1870-1970 collected information on nativity, identifying the foreign born, and the foreign-birth status of both parents, but the 1940 and 1950 censuses collected this information for sample-line individuals only. The extracts used here are therefore limited to sample-line individuals for 1940.[20]

B. Ethnicity groups in the arrivals data

Willcox (1929a) reports information for 1899-1924. I added data for 1925-1929 from US Department of Labor (1926, 1929), later volumes in the source series used by Willcox. These sources show numbers of immigrant aliens admitted by sex and "race or people," as well as tables where statistics by race or people are assigned to alternate countries of origin. This information was used to establish the following correspondence. The Willcox categories appear on the right:

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[20]In 1940 and 1950, one randomly chosen individual in each household was given what later became known as a "Census Long Form" with an extended questionnaire.

1 = British = English, Scotch, Welsh
2 = Irish
3 = Italian = Italian, North and Italian, South
4 = Canadian = French
5 = Mexican
6 = Nordic = Finnish and Scandanavian
7 = German/Austrian = German
8 = Hungarian/Rumanian = Magyar, Rumanian, and Ruthenian
9 = Russian/Polish = Russian, Polish, Lithuanian
10 = Central/East European Jews = Hebrews
11= N.E.C: Armenian, Bohemian and Moravian, Bulgarian, Serbian and Montenegrin, Croatian and Slovenian, Cuban, Dalmatian, Bosnian, Herzegovinian, Dutch and Flemish, Greek, Portuguese, Slovak, Spanish, Spanish-American, Syrian, Turkish

C. Summary arrivals data and plots

The decadal totals used to construct arrivals instruments are given in the Appendix table, which shows sex ratios and arrivals counts. Almost 8 million immigrants came in the first decade, followed by over 6 million in the second and over 4 million in the third. The largest and highest sex ratio group was the Italians, with almost 2 million arrivals and an average sex ratio of 3.74 in the 1900-1919 period.

Figures A1 and A2 illustrate the impact of major historical events on European immigration flows in more detail. The figures plot numbers of arrivals and sex ratios for the German and Hebrew race-or-peoples categories from 1899-1929. Arrivals dipped sharply in 1914, but recovered briefly in the early 1920s. The quotas reduced Jewish immigration in the 1920s though German immigration remained high, probably because the German quota was larger and Germans had more extended family members already here. Sex ratios dipped for both groups after 1920, however, and stayed below earlier levels for the entire decade.

Figures A3 and A4 plot similar data for Mexican and Canadian immigrants. These North American groups provide a useful contrast with the European experience. Mexican immigration increased after 1917 and continued to increase moderately through most of the 1920s. Mexican sex ratios also increased until 1927. Similarly, Canadian immigration and sex ratios increased after 1918, settling in 1925 to a level not unlike that observed from 1909-1914.

Appendix Table: Immigrant Arrivals Data

Ethnic Group	1900-1909		1910-1919		1920-1929	
	Total Immigrants	Sex Ratios	Total Immigrants	Sex Ratios	Total Immigrants	Sex Ratios
British	430776	1.65732	598382	1.22490	798792	1.13412
Irish	368997	0.91085	257619	1.08016	348776	1.05900
Italian	1982418	3.74366	1290899	2.60219	541961	1.50291
Canadian	92398	1.41097	172436	1.31144	247842	1.24377
Mexican	23991	1.99438	173663	1.50318	487775	2.20109
Nordic	640961	1.66360	358893	1.69326	252966	1.62372
German/Austrian	656363	1.47458	409725	1.31401	503159	1.14315
Hungarian/Romanian	491556	3.12192	359999	1.96274	57123	0.92327
Russian/Polish	1002442	2.40189	875191	2.10208	117269	0.92959
Jewish	952767	1.31084	561133	1.19211	342720	0.83217
NEC	1306054	3.56021	1113618	3.15301	469384	1.46335

Notes: The table shows total numbers of alien arrivals and the ratio of men to women among arrivals.

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Table 1
Descriptive Statistics

	Women, Age 18-33			Men, Age 20-35		
	Native	Foreign-Born	Second Generation	Native	Foreign-Born	Second Generation
	(1)	(2)	(3)	(4)	(5)	(6)
			A. 1910 Census			
Age	24.7 (4.5)	25.9 (4.4)	24.8 (4.5)	26.9 (4.6)	27.6 (4.4)	26.9 (4.7)
Married	0.592	0.665	0.475	0.521	0.490	0.402
Ever-married	0.615	0.681	0.490	0.536	0.498	0.411
Children in Household	1.0 (1.5)	1.2 (1.6)	0.7 (1.2)	0.8 (1.3)	0.7 (1.2)	0.6 (1.1)
Mother in Household	0.322	0.136	0.405	0.285	0.099	0.398
Family Size	4.4 (2.2)	4.0 (2.3)	4.6 (2.4)	3.9 (2.3)	3.1 (2.3)	4.3 (2.5)
In Labor Force	0.256	0.348	0.379	0.961	0.987	0.966
Imputed Wages ($1939)	105.9 (212.7)	129.9 (216.8)	163.2 (247.6)	708.2 (464.1)	794.6 (362.8)	775.7 (459.9)
Imputed Family Income	1091.5 (821.5)	1117.5 (779.1)	1338.1 (1005.5)	1157.8 (894.3)	1166.4 (825.0)	1495.5 (1083.6)
Sex Ratio of Foreign Born in Same Ethnic Group			1.288 (0.361)			1.289 (0.359)
N	26,049	7,766	11,098	25,222	11,443	10,064
			B. 1920 Census			
Age	25.0 (4.5)	26.6 (4.3)	25.1 (4.5)	27.1 (4.6)	28.9 (4.3)	27.0 (4.6)
Married	0.621	0.742	0.516	0.564	0.563	0.443
Ever-married	0.647	0.763	0.536	0.581	0.575	0.455
Children in Household	1.0 (1.5)	1.5 (1.7)	0.8 (1.3)	0.8 (1.3)	1.0 (1.4)	0.6 (1.1)
Mother in Household	0.307	0.146	0.391	0.294	0.118	0.407
Family Size	4.4 (2.2)	4.3 (2.2)	4.6 (2.3)	4.1 (2.3)	3.6 (2.3)	4.4 (2.4)
In Labor Force	0.276	0.296	0.404	0.951	0.977	0.955
Imputed Wages ($1939)	130.4 (242.3)	133.1 (238.2)	194.5 (271.3)	742.8 (461.1)	861.3 (381.2)	799.8 (450.5)
Imputed Family Income	1170.6 (885.5)	1214.5 (856.7)	1468.8 (1028.1)	1241.5 (914.2)	1251.3 (818.3)	1606.3 (1113.5)
Sex Ratio of Foreign Born in Same Ethnic Group			1.222 (0.309)			1.224 (0.308)
N	76,082	18,282	31,538	72,044	23,920	28,547

Table 1 (cont.)
Descriptive Statistics

	Women, Age 18-33			Men, Age 20-35		
	Native	Foreign-Born	Second Generation	Native	Foreign-Born	Second Generation
	(1)	(2)	(3)	(4)	(5)	(6)
			C. 1940 Census			
Age	25.1 (4.6)	27.4 (4.4)	25.1 (4.5)	27.1 (4.6)	29.5 (4.4)	27.0 (4.5)
Married	0.635	0.679	0.504	0.594	0.618	0.455
Ever-married	0.662	0.706	0.522	0.608	0.630	0.464
Children in Household	0.9 (1.3)	1.01 (1.4)	0.6 (1.1)	0.7 (1.2)	0.8 (1.2)	0.5 (1.0)
Mother in Household	0.296	0.230	0.429	0.317	0.248	0.444
Family Size	4.0 (2.1)	3.9 (2.0)	4.3 (2.2)	3.9 (2.1)	3.8 (2.0)	4.3 (2.2)
In Labor Force	0.328	0.385	0.464	0.931	0.945	0.931
Imputed Wages ($1939)	169.7 (270.6)	205.1 (289.9)	241.3 (290.3)	744.6	893.6 (461.0)	784.3 (449.5)
Actual Wages	199.5 (389.3)	240.0 (411.3)	289.7 (443.6)	748.4 (759.4)	946.0 (811.0)	819.4 (767.6)
Imputed Family Income	1173.3 (781.6)	1284.8 (798.5)	1497.6 (944.3)	1271.4 (840.7)	1447.6 (894.5)	1642.1 (1040.2)
Actual Family Wages	1246.4 (1228.7)	1495.3 (1286.2)	1598.3 (1296.6)	1267.4 (1257.5)	1517.9 (1287.1)	1678.4 (1371.7)
Sex Ratio of Foreign Born in Same Ethnic Group			1.146 (0.253)			1.155 (0.259)
N	33,091	2,178	10,442	31,633	2,479	10,373

Notes: The table shows means and standard deviations by nativity and census years. The standard deviations are in parentheses. Statistics are weighted by the IPUMS Sample-line weight. The sample excludes institutionalized.

Table 2
Ethnicity and Sex Distribution Among Foreign Stock

	Distribution			Sex Ratios		
	1910	1920	1940	1910	1920	1940
Ethnicity	(1)	(2)	(3)	(4)	(5)	(6)
			A. Foreign-Born			
British	7.0	5.8	8.7	1.17	1.02	0.94
Irish	7.2	4.4	6.0	0.72	0.60	0.65
Italian	14.2	15.6	12.4	2.21	1.46	1.04
Canadian	7.8	6.6	15.9	0.96	0.84	0.78
Mexican	1.4	4.4	6.4	1.67	1.47	0.98
Nordic	9.6	7.1	4.3	1.39	1.29	1.23
German / Austrian	18.9	11.7	14.9	1.24	1.10	1.04
Hungarian / Romanian	4.7	3.5	2.3	1.81	1.03	0.56
Russian / Polish Non-Jews	13.4	19.1	8.4	1.71	1.18	0.78
Central / Eastern European Jews	9.6	9.4	7.0	1.10	1.00	0.75
N.E.C.	6.3	12.5	13.7	2.59	1.78	1.11
			B. Second Generation			
British	12.7	11.0	5.9	0.95	0.93	0.96
Irish	20.0	14.5	6.0	0.89	0.90	0.99
Italian	1.5	3.6	18.1	1.19	1.04	1.03
Canadian	9.3	9.8	6.6	0.93	0.89	0.95
Mexican	0.6	0.7	2.2	1.09	1.00	1.26
Nordic	9.2	12.2	8.8	1.02	0.99	1.03
German / Austrian	39.9	33.0	16.5	0.99	0.96	1.01
Hungarian / Romanian	0.2	0.5	2.6	0.87	1.04	1.08
Russian / Polish Non-Jews	2.2	5.5	19.4	1.11	0.96	0.95
Central / Eastern European Jews	1.3	2.7	4.9	1.02	0.98	0.95
N.E.C.	3.2	6.5	9.1	0.97	0.97	0.98

Notes: Columns 1-3 show the ethnicity distribution of the foreign-born and second generation for men and women aged 18-35. Columns 4-6 show sex ratios by ethnicity and generation. Statistics are weighted by the IPUMS sample-line weight.

Table 3
Differences in Ever-Married Status by Nativity

	Women 18-33			Men 20-35		
	1910	1920	1940	1910	1920	1940
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable Mean	0.594	0.635	0.629	0.498	0.548	0.572
Regressors						
Foreign-born	0.009	0.044	-0.051	-0.077	-0.091	-0.089
	(0.006)	(0.004)	(0.009)	(0.005)	(0.003)	(0.009)
2nd Generation	-0.136	-0.118	-0.123	-0.113	-0.108	-0.121
	(0.008)	(0.004)	(0.008)	(0.008)	(0.005)	(0.008)
2nd Generation and Both Parents Foreign-Born	0.013	0.004	-0.032	-0.009	-0.017	-0.026
	(0.009)	(0.005)	(0.009)	(0.009)	(0.006)	(0.009)
N	45,079	126,349	46,270	47,064	125,523	45,811

Notes: The table shows estimates from regressions of a dummy for ever-married on dummies indicating nativity and age. Standard errors are reported in parentheses.

Table 4
Endogamy in the First and Second Generation (1910-20 Only)

	Women 18-33			Men 20-35		
	Married Native	Endogamous Marriage	Married Other Foreign Stock	Married Native	Endogamous Marriage	Married Other Foreign Stock
Nativity	(1)	(2)	(3)	(4)	(5)	(6)
Native	84.7	-	15.3	85.1	-	14.9
2nd Generation						
British	53.0	19.8	27.2	54.1	18.5	27.4
Irish	38.9	30.9	30.2	41.3	30.6	28.1
Italian	5.8	86.1	8.1	21.5	49.3	29.2
Canadian	44.1	30.6	25.3	43.3	31.1	25.6
Mexican	12.4	80.9	6.7	17.2	77.9	4.9
Nordic	33.2	45.0	21.8	34.5	43.4	22.1
German / Austrian	34.9	48.5	16.6	38.9	45.3	15.8
Hungarian / Romanian	10.5	48.4	41.1	20.0	30.6	49.4
Russian / Polish Non-Jews	6.5	77.4	16.1	11.0	70.9	18.1
Central / Eastern European Jews	1.2	86.7	12.1	5.3	77.3	17.4
2nd Generation, NEC	30.7	40.1	29.2	37.2	35.2	27.6
Foreign-born						
British	26.4	49.1	24.5	26.1	48.2	25.7
Irish	15.0	67.3	17.7	8.8	78.4	12.8
Italian	0.3	98.6	1.1	3.1	93.0	3.9
Canadian	30.1	50.0	19.9	25.3	54.4	20.3
Mexican	4.3	92.0	3.7	6.8	92.0	1.2
Nordic	7.1	82.7	10.2	10.3	80.2	9.5
German / Austrian	9.4	79.9	10.7	10.3	80.0	9.7
Hungarian / Romanian	0.3	89.1	10.6	0.7	88.5	10.8
Russian / Polish Non-Jews	0.6	94.7	4.7	1.3	93.6	5.1
Central / Eastern European Jews	0.3	97.3	2.4	0.4	95.9	3.7
2nd Generation, NEC	6.5	82.5	11.0	9.9	75.0	15.1

Notes: The table shows probabilities of marital matching by nativity for married men aged 20-35 and married women aged 18-33 in the 1910 and 1920 censuses with spouse present.

Table 5
First Stage Relationships

Endogenous Variable	Instrument	Foreign-Born Sex Ratio Endogenous: Women Dep. Var. Mean	Foreign-Born Sex Ratio Endogenous: Women Coefficient	Foreign-Born Sex Ratio Endogenous: Men Dep. Var. Mean	Foreign-Born Sex Ratio Endogenous: Men Coefficient	Foreign Stock Sex Ratio Endogenous: Women Dep. Var. Mean	Foreign Stock Sex Ratio Endogenous: Women Coefficient	Foreign Stock Sex Ratio Endogenous: Men Dep. Var. Mean	Foreign Stock Sex Ratio Endogenous: Men Coefficient
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		A. Younger Cohort (Women 18-33, Men 20-35)							
Sex Ratio	Arrivals Ratio	1.21	0.531 (0.026)	1.22	0.534 (0.027)	1.02	0.357 (0.018)	1.02	0.355 (0.019)
	Ln (Immigration Count)		-0.082 (0.022)		-0.084 (0.022)		-0.004 (0.015)		-0.002 (0.015)
Ln (Number of Foreign Born)*	Arrivals Ratio	12.6	-0.390 (0.056)	12.5	-0.402 (0.056)	12.6	-0.390 (0.056)	12.5	-0.402 (0.056)
	Ln (Immigration Count)		0.617 (0.047)		0.623 (0.046)		0.617 (0.047)		0.623 (0.046)
		B. Older Cohort (Women 34-48, Men 36-50)							
Sex Ratio	Arrivals Ratio	1.15	0.236 (0.035)	1.16	0.234 (0.035)	1.04	0.146 (0.019)	1.04	0.144 (0.019)
	Ln (Immigration Count)		-0.053 (0.030)		-0.058 (0.030)		0.044 (0.016)		0.034 (0.016)
Ln (Number of Foreign Born)*	Arrivals Ratio	13.0	-0.596 (0.046)	13.0	-0.614 (0.046)	13.0	-0.596 (0.046)	13.0	-0.614 (0.046)
	Ln (Immigration Count)		0.118 (0.039)		0.155 (0.039)		0.118 (0.039)		0.155 (0.039)

Notes: The table shows results from regressions of the indicated endogenous variables on arrivals ratios and log (number of arrivals) by year and ethnicity. Standard errors are reported in parentheses.

* This variable is the same for both models.

Table 6
OLS and IV Estimates for Women Aged 18-33

			Model			
			Foreign Born Ratio Endogenous		Foreign Stock Ratio Endogenous	
Dependent Variable	Mean	Regressor	OLS	2SLS	OLS	2SLS
	(1)		(2)	(3)	(4)	(5)
		A. Family Structure				
Ever Married	0.517	Sex Ratio	0.132	0.150	0.177	0.203
			(0.015)	(0.018)	(0.019)	(0.024)
		Ln (# Foreign Born)	0.023	0.005	0.005	-0.014
			(0.011)	(0.013)	(0.010)	(0.013)
Currently Married	0.500	Sex Ratio	0.124	0.143	0.169	0.194
			(0.015)	(0.018)	(0.019)	(0.024)
		Ln (# Foreign Born)	0.020	0.003	0.004	-0.015
			(0.011)	(0.013)	(0.010)	(0.013)
Own Kids in HH	0.358	Sex Ratio	0.121	0.129	0.159	0.174
			(0.015)	(0.017)	(0.019)	(0.023)
		Ln (# Foreign Born)	0.045	0.040	0.029	0.024
			(0.010)	(0.012)	(0.010)	(0.012)
Mother in HH	0.409	Sex Ratio	-0.099	-0.093	-0.123	-0.125
			(0.020)	(0.023)	(0.025)	(0.031)
		Ln (# Foreign Born)	-0.036	-0.026	-0.023	-0.015
			(0.015)	(0.017)	(0.014)	(0.017)
Family Size	4.485	Sex Ratio	-0.175	-0.178	-0.170	-0.241
			(0.142)	(0.165)	(0.175)	(0.224)
		Ln (# Foreign Born)	0.244	0.343	0.270	0.365
			(0.108)	(0.128)	(0.103)	(0.129)
# Aged 14-69 in Family	3.379	Sex Ratio	-0.521	-0.572	-0.681	-0.773
			(0.096)	(0.111)	(0.120)	(0.151)
		Ln (# Foreign Born)	-0.045	0.013	0.023	0.085
			(0.072)	(0.085)	(0.069)	(0.087)
Respondent is Head of HH	0.018	Sex Ratio	0.009	0.009	0.011	0.013
			(0.004)	(0.005)	(0.005)	(0.007)
		Ln (# Foreign Born)	0.008	0.009	0.007	0.008
			(0.003)	(0.003)	(0.003)	(0.003)

Table 6 (cont.)
OLS and IV Estimates for Women Aged 18-33

Dependent Variable	Mean	Regressor	Model: Foreign Born Ratio Endogenous OLS	Model: Foreign Born Ratio Endogenous 2SLS	Model: Foreign Stock Ratio Endogenous OLS	Model: Foreign Stock Ratio Endogenous 2SLS
	(1)		(2)	(3)	(4)	(5)
B. Economic Outcomes						
In the Labor Force	0.420	Sex Ratio	-0.098	-0.099	-0.122	-0.134
			(0.015)	(0.017)	(0.019)	(0.023)
		Ln (# Foreign Born)	-0.029	-0.012	-0.016	0.001
			(0.010)	(0.012)	(0.010)	(0.012)
Occupational Income Score	203.3	Sex Ratio	-57.21	-54.38	-72.14	-73.51
			(8.03)	(8.91)	(10.52)	(12.32)
		Ln (# Foreign Born)	-25.69	-20.08	-18.24	-13.28
			(5.19)	(6.16)	(5.17)	(6.39)
Log Occupational Wage	6.099	Sex Ratio	-0.021	-0.012	-0.042	-0.016
			(0.015)	(0.017)	(0.020)	(0.023)
		Ln (# Foreign Born)	-0.031	-0.039	-0.028	-0.037
			(0.010)	(0.012)	(0.010)	(0.012)
Spouse's Income Score	473.0	Sex Ratio	112.4	125.6	148.5	169.8
			(17.1)	(19.3)	(21.7)	(25.9)
		Ln (# Foreign Born)	19.0	6.6	4.3	-9.1
			(11.4)	(13.8)	(11.0)	(13.8)
Combined Husband and Wife Income Score	676.4	Sex Ratio	55.54	71.66	76.74	96.87
			(15.91)	(18.10)	(20.11)	(24.21)
		Ln (# Foreign Born)	-6.66	-13.50	-13.93	-22.46
			(10.93)	(13.13)	(10.44)	(13.05)
Family Income Score	1456.4	Sex Ratio	-206.2	-218.5	-270.6	-295.3
			(42.4)	(48.2)	(53.4)	(65.8)
		Ln (# Foreign Born)	-51.1	-22.9	-24.2	4.4
			(30.8)	(36.2)	(29.6)	(36.9)
Family Income Score per Member Aged 14-69	451.2	Sex Ratio	5.63	7.07	8.06	9.55
			(7.56)	(8.55)	(9.62)	(11.54)
		Ln (# Foreign Born)	-6.78	-6.10	-7.52	-6.98
			(5.20)	(6.19)	(5.01)	(6.23)

Notes: The table shows OLS and 2SLS estimates of equation (1) in the text. Other regressors in the model include year, ethnicity, and age effects and dummies for nativity status. Standard errors are reported in parentheses.

Table 7
OLS and IV Estimates for Men Aged 20-35

			Model			
			Foreign Born Ratio Endogenous		Foreign Stock Ratio Endogenous	
Dependent Variable	Mean	Regressor	OLS	2SLS	OLS	2SLS
	(1)		(2)	(3)	(4)	(5)
		A. Family Structure				
Ever Married	0.447	Sex Ratio	0.025	0.036	0.007	0.048
			(0.015)	(0.017)	(0.019)	(0.024)
		Ln (# Foreign Born)	0.002	0.000	-0.002	-0.005
			(0.010)	(0.012)	(0.010)	(0.013)
Currently Married	0.436	Sex Ratio	0.018	0.029	0.001	0.039
			(0.015)	(0.017)	(0.019)	(0.024)
		Ln (# Foreign Born)	0.003	0.002	0.001	-0.002
			(0.010)	(0.012)	(0.010)	(0.012)
Own Kids in HH	0.291	Sex Ratio	0.024	0.032	0.011	0.043
			(0.015)	(0.018)	(0.019)	(0.024)
		Ln (# Foreign Born)	0.013	0.018	0.010	0.013
			(0.010)	(0.013)	(0.010)	(0.012)
Mother in HH	0.419	Sex Ratio	-0.046	-0.045	-0.047	-0.061
			(0.021)	(0.022)	(0.026)	(0.030)
		Ln (# Foreign Born)	-0.006	-0.014	0.001	-0.008
			(0.015)	(0.016)	(0.014)	(0.018)
Family Size	4.327	Sex Ratio	-0.299	-0.382	-0.414	-0.518
			(0.165)	(0.188)	(0.203)	(0.254)
		Ln (# Foreign Born)	0.120	0.163	0.161	0.214
			(0.123)	(0.144)	(0.116)	(0.144)
# Aged 14-69 in Family	3.395	Sex Ratio	-0.460	-0.531	-0.629	-0.720
			(0.120)	(0.137)	(0.148)	(0.186)
		Ln (# Foreign Born)	-0.016	0.004	0.047	0.074
			(0.089)	(0.104)	(0.084)	(0.105)
Respondent is Head of HH	0.401	Sex Ratio	0.027	0.045	0.027	0.061
			(0.017)	(0.019)	(0.022)	(0.027)
		Ln (# Foreign Born)	0.014	0.011	0.011	0.005
			(0.012)	(0.014)	(0.011)	(0.014)

Table 7 (cont.)
OLS and IV Estimates for Men Aged 20-35

Dependent Variable	Mean	Regressor	Model: Foreign Born Ratio Endogenous OLS	Model: Foreign Born Ratio Endogenous 2SLS	Model: Foreign Stock Ratio Endogenous OLS	Model: Foreign Stock Ratio Endogenous 2SLS
	(1)		(2)	(3)	(4)	(5)
B. Economic Outcomes						
In the Labor Force	0.949	Sex Ratio	0.005	0.009	0.002	0.012
			(0.007)	(0.008)	(0.009)	(0.010)
		Ln (# Foreign Born)	0.002	0.003	0.002	0.002
			(0.004)	(0.005)	(0.004)	(0.005)
Occupational Income Score	786.8	Sex Ratio	9.53	11.0	4.43	14.86
			(13.18)	(14.74)	(16.94)	(20.01)
		Ln (# of Immigrants)	-1.53	-2.26	-2.86	-3.70
			(8.80)	(10.44)	(8.50)	(10.52)
Log Occupational Wage	6.581	Sex Ratio	0.032	0.036	0.032	0.049
			(0.019)	(0.021)	(0.024)	(0.029)
		Ln (# of Immigrants)	0.005	0.008	0.001	0.004
			(0.013)	(0.015)	(0.012)	(0.015)
Spouse's Income Score	26.67	Sex Ratio	-9.49	-12.62	-14.01	-17.10
			(4.78)	(5.34)	(6.06)	(7.19)
		Ln (# of Immigrants)	0.83	0.063	2.12	1.72
			(3.28)	(3.85)	(3.12)	(3.83)
Combined Husband and Wife Income Score	813.4	Sex Ratio	-0.21	-1.83	-9.95	-2.48
			(14.22)	(15.90)	(18.20)	(21.55)
		Ln (# of Immigrants)	-0.59	-2.06	-0.60	-1.82
			(9.54)	(11.30)	(9.15)	(11.33)
Family Income Score	1589.1	Sex Ratio	-181.2	-223.7	-250.8	-303.3
			(54.7)	(62.0)	(68.5)	(84.4)
		Ln (# of Immigrants)	-38.4	-18.9	-13.7	10.4
			(39.7)	(46.6)	(37.9)	(46.9)
Family Income Score per Member Aged 14-69	507.3	Sex Ratio	7.87	4.21	7.96	5.71
			(10.23)	(11.53)	(13.04)	(15.63)
		Ln (# of Immigrants)	-7.09	-7.67	-8.18	-8.22
			(7.05)	(8.36)	(6.78)	(8.38)

Notes: The table shows OLS and 2SLS results of equation (1) in the test. Other regressors in the model include year, ethnicity, and age effects and dummies for nativity status. Standard errors are reported in parentheses.

Table 8
Interactions with Group Endogamy Rates Conditional on Being Married

	OLS			2SLS		
	Main Effect	Interaction Effect	Effect at Mean	Main Effect	Interaction Effect	Effect at Mean
Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
			A. Women			
Ever Married	-0.069	0.412	0.115	-0.178	0.784	0.172
	(0.061)	(0.121)		(0.080)	(0.181)	
Mother in HH	0.074	-0.390	-0.100	0.106	-0.496	-0.116
	(0.091)	(0.180)		(0.102)	(0.230)	
Family Size	-0.835	1.069	-0.357	-0.830	0.805	-0.470
	(0.689)	(1.362)		(0.773)	(1.734)	
Respondent is Head of HH	0.020	-0.023	0.010	0.013	0.002	0.014
	(0.018)	(0.036)		(0.020)	(0.045)	
In the Labor Force	0.088	-0.352	-0.069	0.118	-0.477	-0.095
	(0.053)	(0.105)		(0.064)	(0.145)	
Occupational Income Score	55.4	-220.5	-43.2	76.1	-289.8	-53.5
	(27.6)	(54.5)		(31.8)	(72.9)	
Log Occupational Wage	0.000	-0.096	-0.043	-0.014	-0.026	-0.026
	(0.052)	(0.102)		(0.057)	(0.131)	
Combined Husband and Wife Income Score	-67.4	311.4	71.8	-151.9	596.9	114.9
	(57.4)	(113.6)		(70.1)	(159.0)	
Family Income Score per Member Aged 14-69	-35.9	108.0	12.3	-40.2	117.5	12.4
	(26.6)	(52.5)		(29.4)	(67.0)	
			B. Men			
Ever Married	0.049	-0.037	0.034	-0.134	0.535	0.089
	(0.064)	(0.155)		(0.105)	(0.318)	
Mother in HH	-0.024	-0.101	-0.066	0.073	-0.254	-0.033
	(0.089)	(0.218)		(0.135)	(0.407)	
Family Size	-0.894	1.334	-0.338	-1.069	1.730	-0.348
	(0.740)	(1.804)		(0.112)	(3.379)	
Respondent is Head of HH	0.081	-0.121	0.031	-0.064	0.360	0.086
	(0.073)	(0.178)		(0.116)	(0.348)	
In the Labor Force	-0.022	0.084	0.013	-0.091	0.311	0.039
	(0.025)	(0.060)		(0.037)	(0.111)	
Occupational Income Score	-3.3	31.6	9.9	-31.9	136.0	24.8
	(48.4)	(117.8)		(70.2)	(212.4)	
Log Occupational Wage	-0.018	0.153	0.046	-0.040	0.245	0.062
	(0.068)	(0.165)		(0.098)	(0.297)	
Combined Husband and Wife Income Score	28.6	-71.3	-1.1	28.9	-58.7	4.4
	(53.9)	(131.4)		(78.8)	(238.6)	
Family Income Score per Member Aged 14-69	32.0	-57.3	8.1	76.0	-203.1	-8.7
	(41.9)	(102.1)		(64.1)	(193.5)	

Notes: The table shows estimates of equation (4) in the text. Standard errors are reported in parentheses.

Table 9
Estimates Controlling for Parent's Sex Ratios

Dependent Variable	Ratio in Levels				Ratio in Logs			
	OLS		2SLS		OLS		2SLS	
	Own Generation	Parents' Generation	Own Generation	Parents' Generation	Own Generation	Parents' Generation	Own Generation	Parents' Generation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				A. Women				
Ever Married	0.099	-0.075	0.172	-0.082	0.151	-0.131	0.308	-0.183
	(0.031)	(0.039)	(0.044)	(0.038)	(0.047)	(0.055)	(0.083)	(0.058)
Mother in HH	-0.090	0.011	-0.065	0.002	-0.145	0.043	-0.120	0.032
	(0.042)	(0.056)	(0.060)	(0.058)	(0.066)	(0.082)	(0.108)	(0.091)
Respondent is Head of HH	0.013	-0.001	0.013	-0.001	0.018	-0.007	0.023	-0.009
	(0.009)	(0.011)	(0.012)	(0.011)	(0.013)	(0.015)	(0.022)	(0.017)
In the Labor Force	-0.061	0.011	-0.070	0.005	-0.107	0.027	-0.127	0.030
	(0.030)	(0.037)	(0.042)	(0.038)	(0.045)	(0.052)	(0.076)	(0.057)
Occupational Income Score	-25.13	0.73	-16.00	-3.99	-52.05	6.96	-29.01	-2.69
	(15.85)	(18.93)	(21.74)	(20.34)	(23.55)	(25.99)	(39.15)	(30.53)
Log Occupational Wage	0.027	0.057	0.073	0.049	0.056	0.067	0.138	0.040
	(0.030)	(0.034)	(0.044)	(0.034)	(0.043)	(0.047)	(0.080)	(0.052)
Combined Husband and Wife Income Score	67.25	-53.10	130.39	-63.61	90.98	-91.13	233.70	-140.35
	(31.52)	(39.91)	(44.71)	(39.71)	(48.59)	(57.03)	(84.11)	(60.63)
Family Income Score per Member Aged 14-69	13.31	-12.52	18.67	-14.17	23.41	-23.37	33.13	-27.20
	(15.13)	(19.25)	(21.25)	(19.83)	(23.27)	(27.39)	(38.44)	(30.50)
				B. Men				
Ever Married	0.057	0.083	0.095	0.079	0.037	0.098	0.182	0.055
	(0.030)	(0.038)	(0.042)	(0.038)	(0.046)	(0.053)	(0.082)	(0.056)
Mother in HH	-0.083	-0.083	-0.070	-0.083	-0.093	-0.091	-0.136	-0.078
	(0.043)	(0.060)	(0.063)	(0.062)	(0.068)	(0.086)	(0.115)	(0.094)
Respondent is Head of HH	0.007	0.068	0.080	0.060	-0.010	0.089	0.153	0.041
	(0.035)	(0.047)	(0.050)	(0.047)	(0.055)	(0.068)	(0.093)	(0.070)
In the Labor Force	0.015	0.044	0.028	0.042	0.026	0.047	0.056	0.038
	(0.014)	(0.017)	(0.019)	(0.017)	(0.021)	(0.024)	(0.036)	(0.024)
Occupational Income Score	58.23	-14.03	61.88	-14.97	71.19	-40.89	114.10	-53.57
	(26.12)	(33.30)	(36.84)	(33.39)	(40.26)	(46.59)	(69.02)	(48.51)
Log Occupational Wage	0.051	-0.046	0.069	-0.050	0.044	-0.080	0.125	-0.104
	(0.038)	(0.051)	(0.054)	(0.050)	(0.059)	(0.071)	(0.101)	(0.074)
Combined Husband and Wife Income Score	69.48	-33.48	60.82	-32.94	70.14	-67.63	111.22	-79.82
	(27.52)	(34.89)	(38.82)	(35.17)	(42.41)	(48.90)	(72.89)	(50.85)
Family Income Score per Member Aged 14-69	40.45	-50.89	26.42	-49.63	49.95	-81.02	45.58	-79.87
	(19.95)	(26.37)	(28.64)	(27.27)	(30.87)	(36.74)	(52.21)	(40.27)

Notes: The table shows estimates of equation (5) in the text. Standard errors are reported in parentheses.

Table 10
Effects on the Third Generation

		Children Under 5			All Children		
Dependent Variable	Regressor	Dep. Var. Mean (1)	OLS (2)	2SLS (3)	Dep. Var. Mean (4)	OLS (5)	2SLS (6)
Mother is Married	Sex Ratio	0.982	0.010 (0.007)	0.014 (0.008)	0.973	-0.008 (0.008)	0.008 (0.009)
	Ln (# Foreign Born)		0.008 (0.004)	0.012 (0.005)		-0.002 (0.005)	0.000 (0.006)
Family Size	Sex Ratio	4.89	0.039 (0.121)	0.024 (0.139)	5.17	-0.062 (0.195)	-0.040 (0.226)
	Ln (# Foreign Born)		0.285 (0.087)	0.301 (0.105)		0.274 (0.147)	0.287 (0.175)
# Aged 14-69 in Family	Sex Ratio	2.415	-0.171 (0.054)	-0.195 (0.061)	2.418	-0.150 (0.046)	-0.178 (0.053)
	Ln (# Foreign Born)		-0.023 (0.034)	-0.029 (0.041)		-0.051 (0.029)	-0.075 (0.035)
Mother Works	Sex Ratio	0.055	-0.001 (0.012)	-0.001 (0.014)	0.072	-0.019 (0.013)	-0.025 (0.014)
	Ln (# Foreign Born)		-0.009 (0.008)	-0.008 (0.009)		-0.004 (0.008)	0.006 (0.010)
Mother's Occupational Income Score	Sex Ratio	24.46	-9.54 (6.44)	-10.14 (7.26)	35.85	-15.76 (7.32)	-19.08 (8.30)
	Ln (# Foreign Born)		-6.53 (4.06)	-7.30 (4.90)		-5.85 (4.65)	-2.40 (5.56)
Father's Occupational Income Score	Sex Ratio	927.3	49.9 (23.6)	49.6 (26.6)	941.5	46.0 (22.0)	55.3 (24.9)
	Ln (# Foreign Born)		16.0 (14.8)	21.9 (17.8)		18.2 (13.7)	15.7 (16.4)
Parents' Income Score	Sex Ratio	951.7	40.2 (24.0)	39.3 (27.0)	977.3	30.3 (22.7)	36.0 (25.7)
	Ln (# Foreign Born)		9.3 (15.1)	14.3 (18.2)		12.3 (14.4)	13.3 (17.2)
Family Income Score per Member Aged 14-69	Sex Ratio	472.5	26.0 (11.7)	24.1 (13.1)	479.6	32.6 (11.3)	29.0 (12.8)
	Ln (# Foreign Born)		2.5 (7.3)	4.5 (8.8)		10.9 (7.3)	13.7 (8.7)
N		14,976			19,190		

Notes: The table shows estimates of equation (1) in the text, weighted by the number of children under 5 (columns 1-3) or weighted by the total number of children in the household (columns 4-6). Standard errors are reported in parentheses.

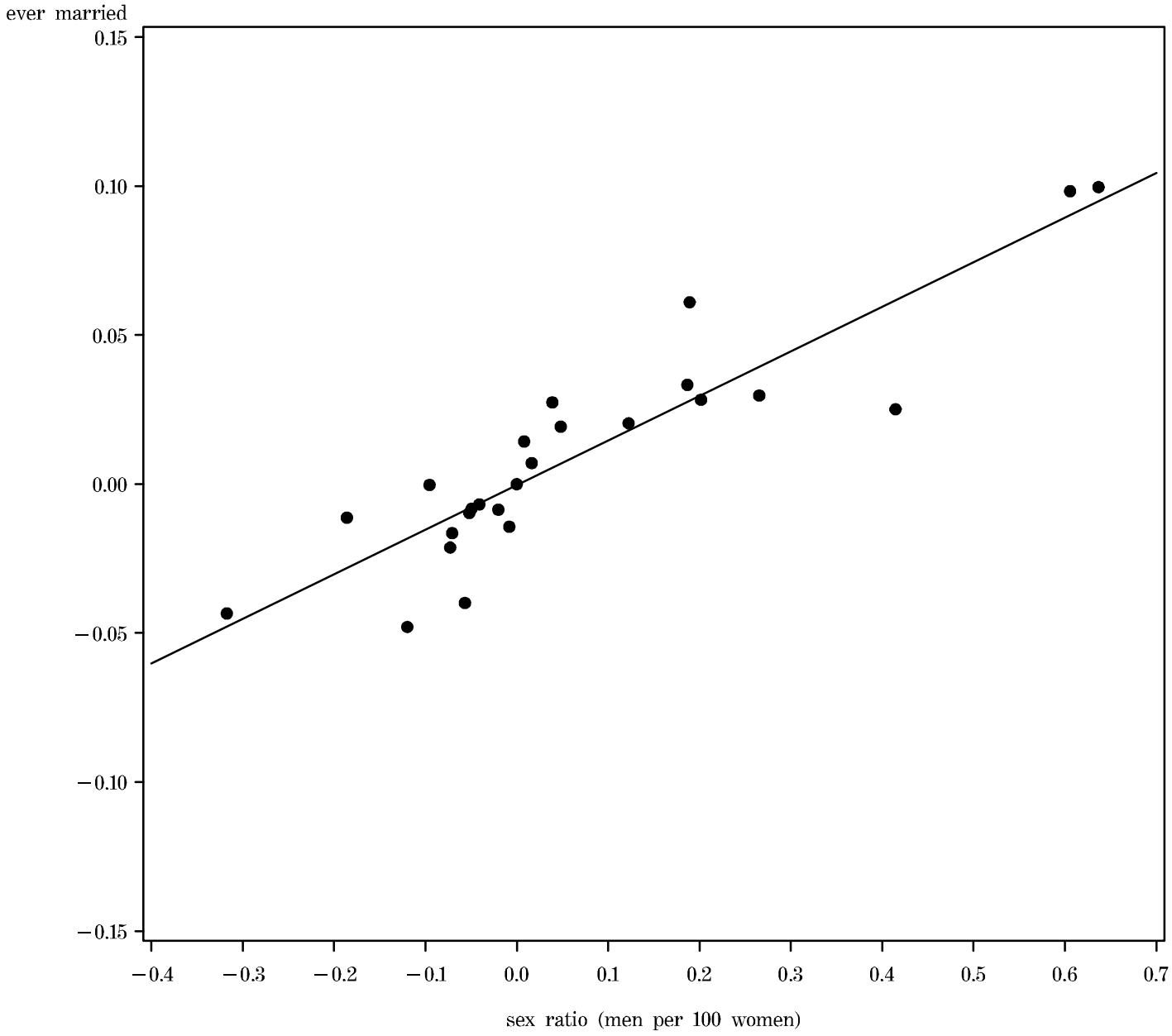


Figure 1. Ever−married by sex−ratio in foreign born ethnic group, aged 20−35.
Women aged 18−33 in top 2nd−generation groups in 1910, 1920, and 1940 IPUMS.

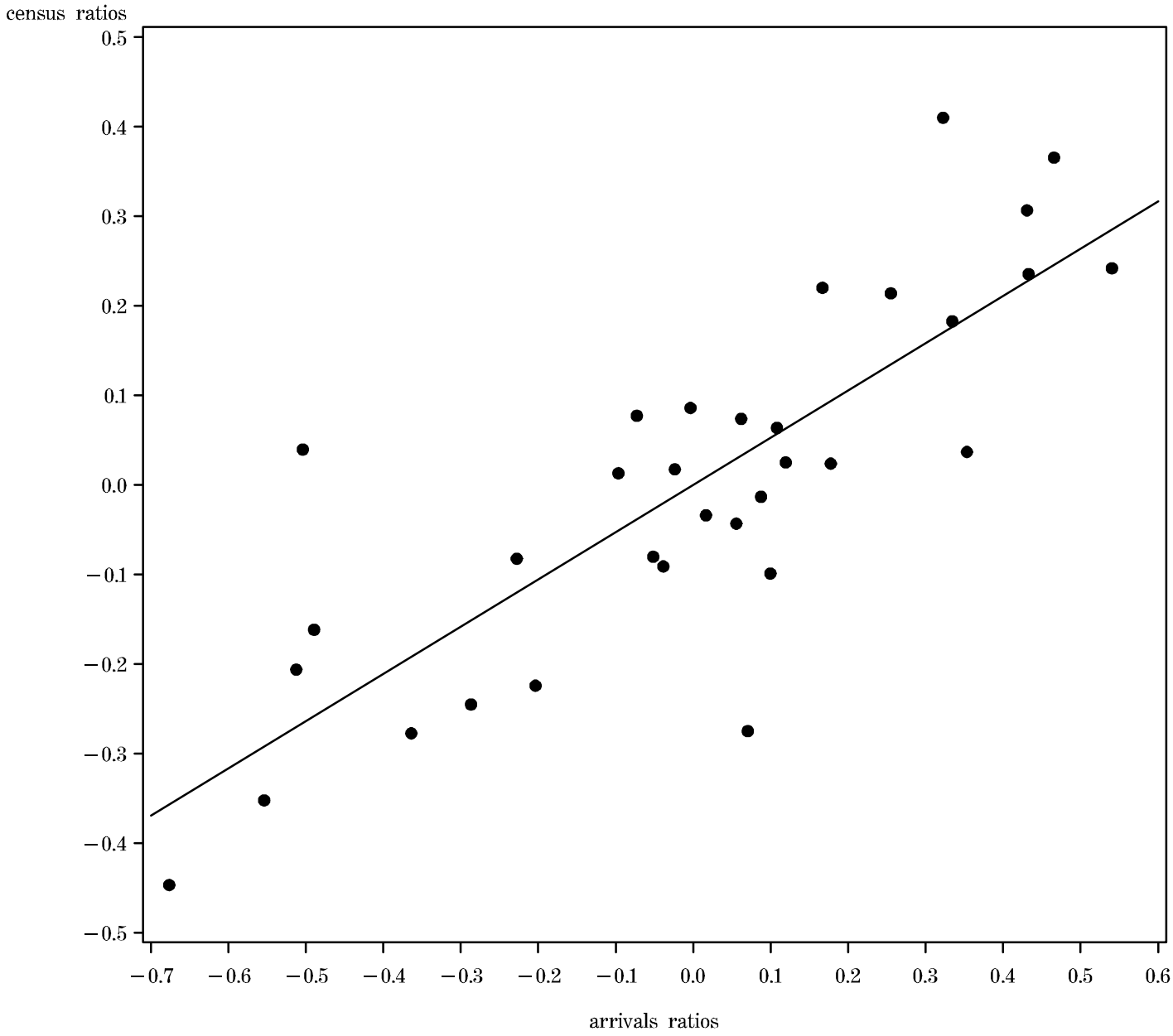


Figure 2. Census vs. arrivals−data sex ratios, foreign born aged 20−35.
Adjusted for ethnicity, year, and immigration−size effects.

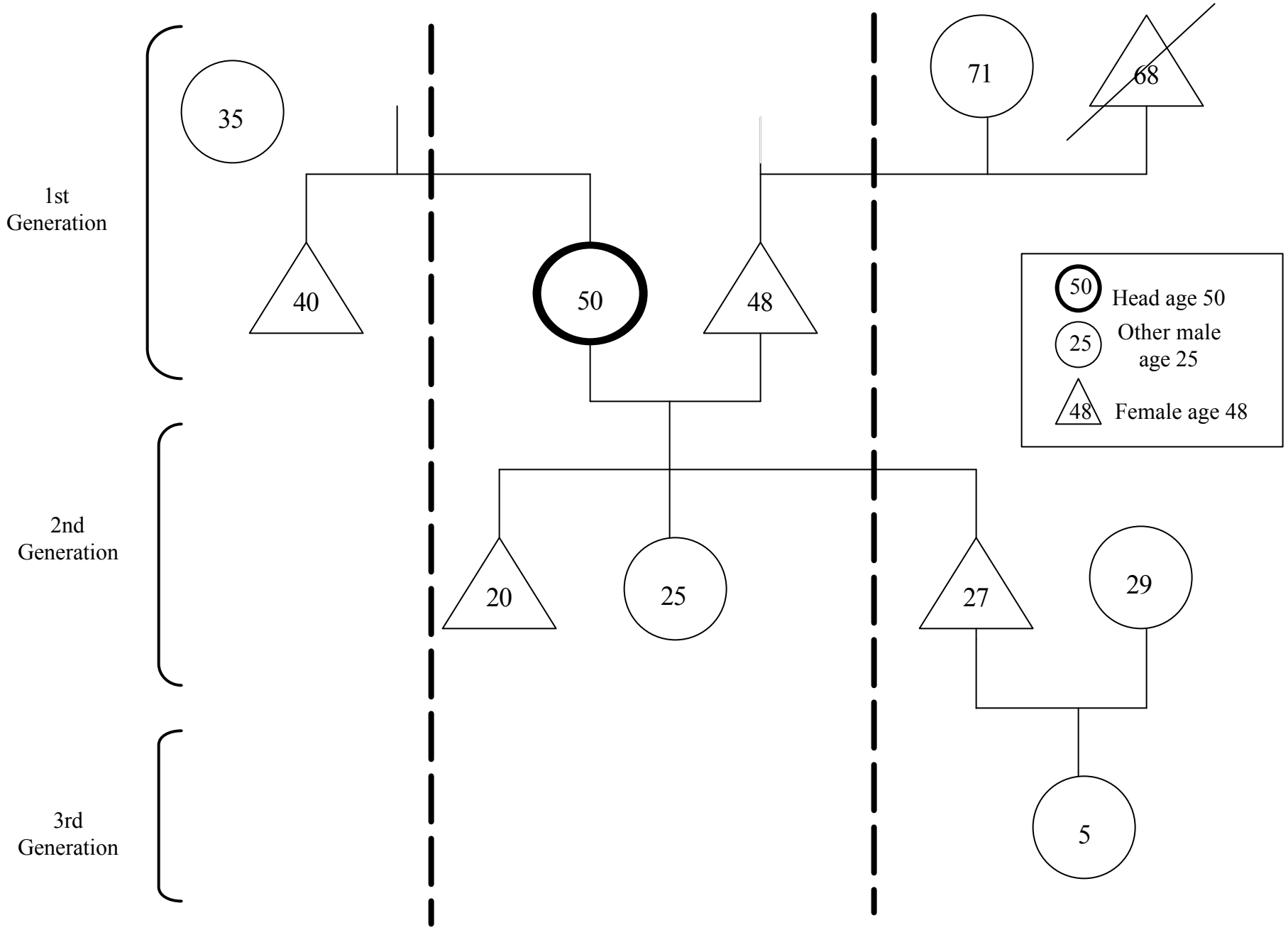
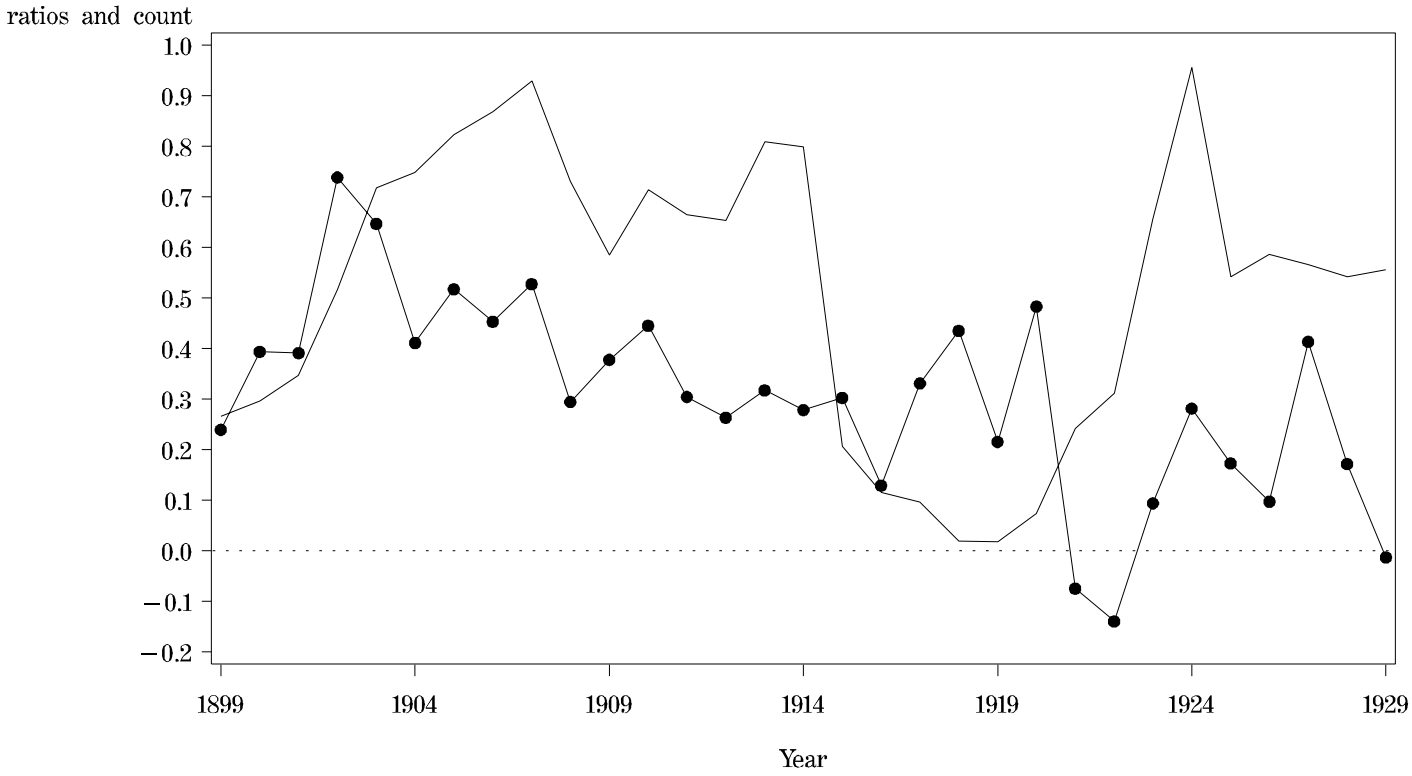
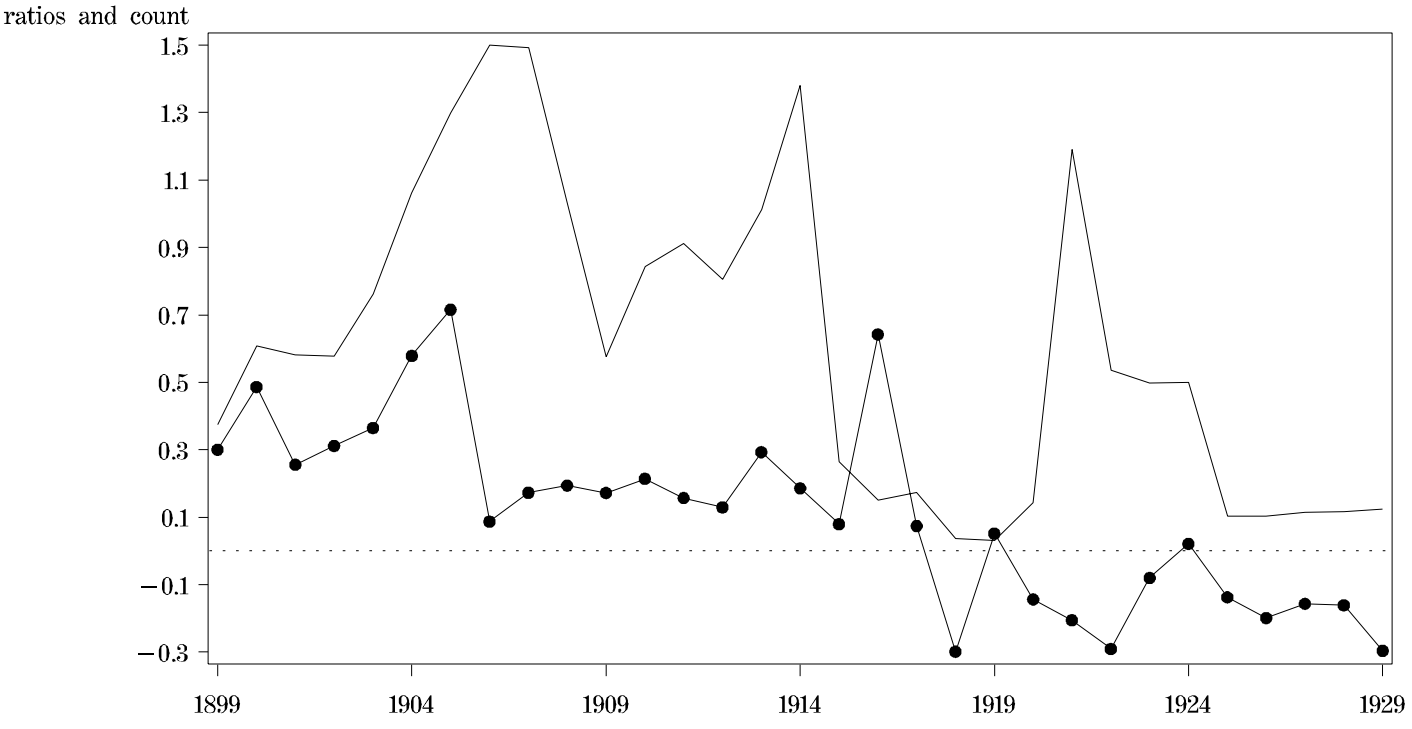


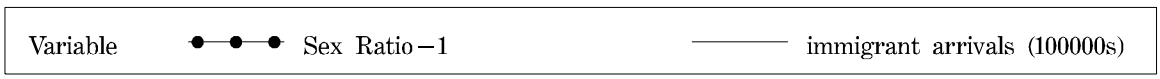
Figure 3. Structure of an immigrant family



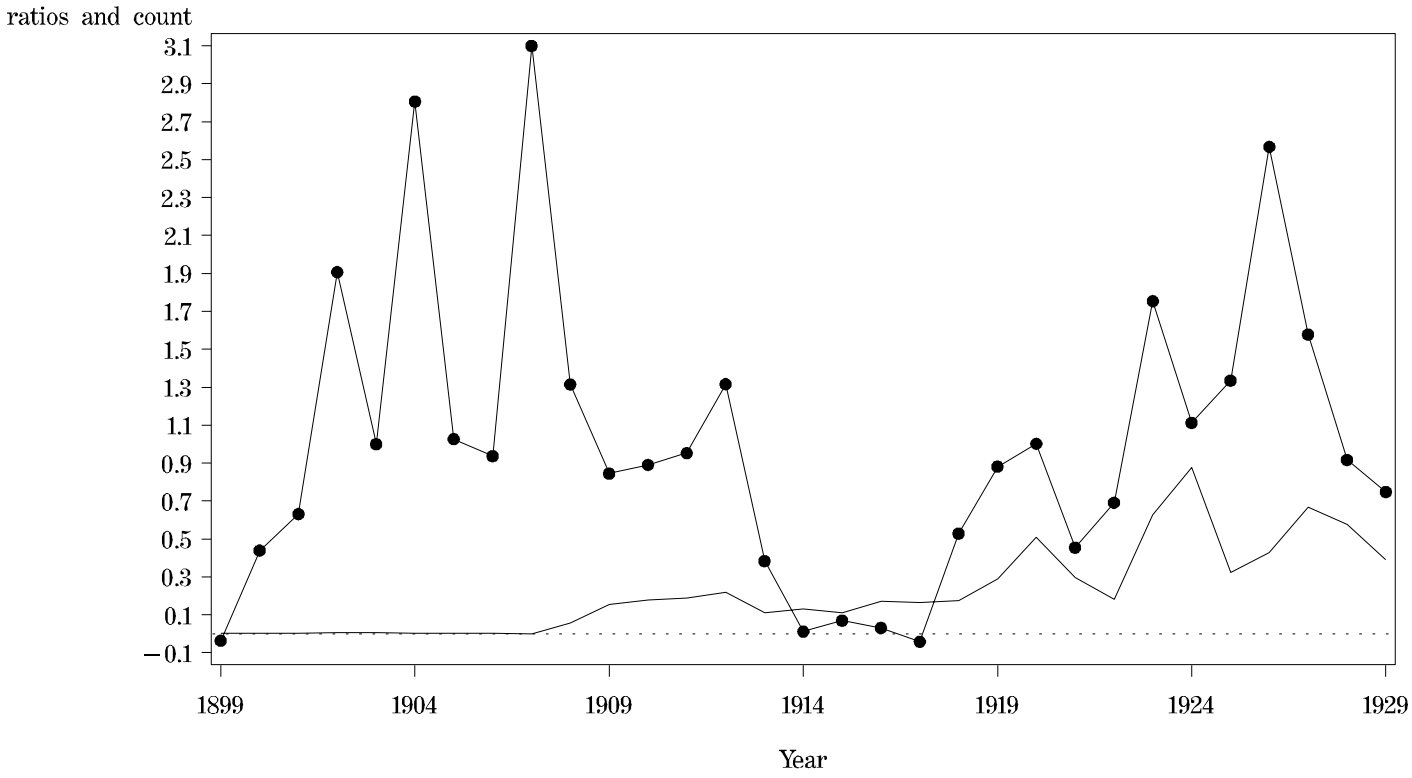
a. Germans (Non-Jewish)



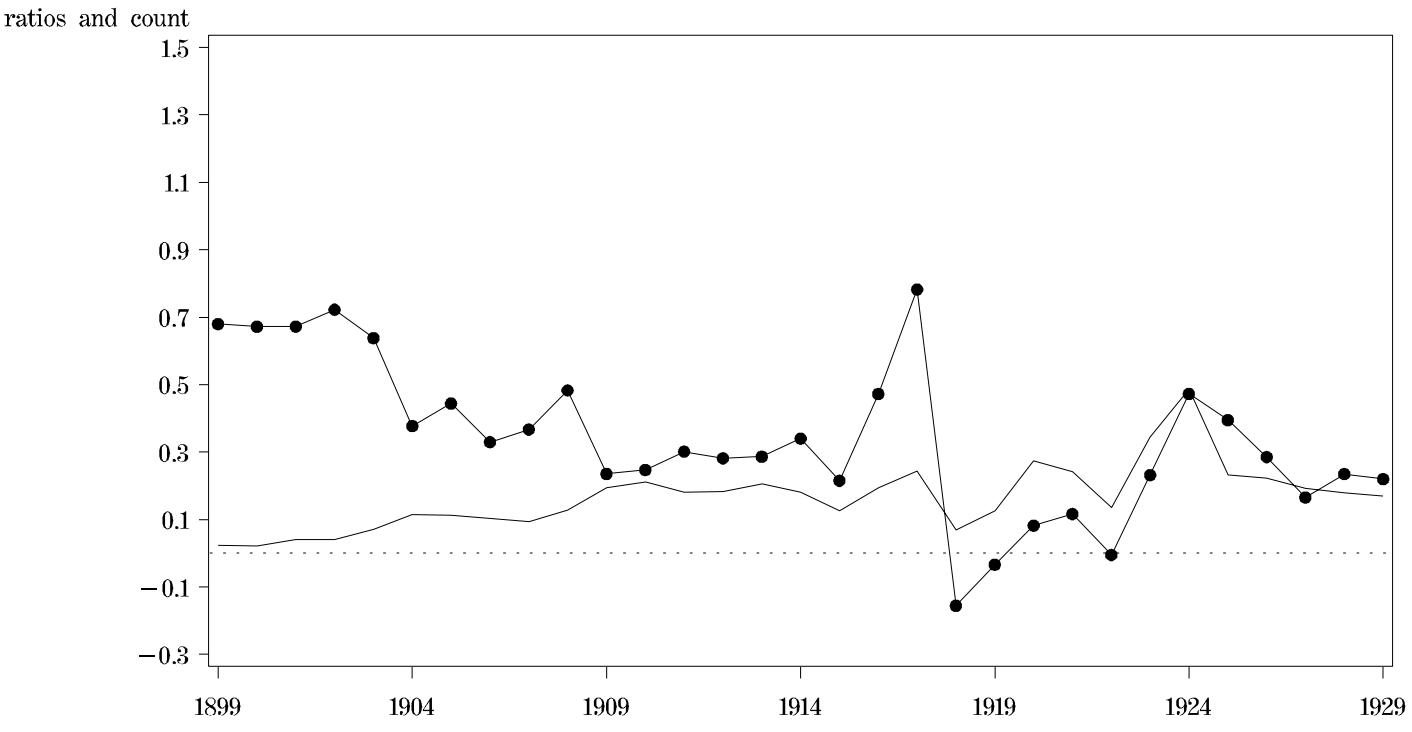
b. European Jews



Appendix Figure. Sex ratios and numbers of immigrants, 1899-1930.
Source: Willcox and Annual Reports of the Commissioner General of Immigration



c. Mexicans



d. Canadians

Appendix Figure (continued). Sex ratios and numbers of immigrants, 1899-1930.
Source: Willcox and Annual Reports of the Commissioner General of Immigration