Low Skilled Immigration and Work-Fertility Tradeoffs Among High Skilled US Natives

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Fertility and labor force participation are simultaneous outcomes of a single time-allocation decision. Empirical work by economists has largely focused on identifying a causal effect of childbearing on employment using a variety of mechanisms to provide variation in fertility that is exogenous to other determinants of family and work decisions. However, a parallel demographic literature is devoted to understanding the extent and determinants of the tradeoff (or "role incompatibility") that women face in their allocation of time between working and parenting (Karin L. Brewster and Ronald R. Rindfuss 2000).

The most often used measure of role incompatibility is the correlation between fertility and female labor force participation (FLFP). Cross-country research focuses on the substantial differences in family policies, child care availability, unemployment rates, stability of labor contracts, and gender norms that may result in international differences in the correlation between childbearing and work (Brewster and Rindfuss 2000; Alicia Adsera 2004). Although numerous studies continue to document a negative individual-level relationship between childbearing and FLFP, the within country correlation between the two has weakened substantially in the past 50 years, especially in the United States (Henriette Engelhardt, Tomas Kögel, and Alexia Prskawetz 2004). We argue that a partial explanation for this phenomenon is the steady stream of low skilled immigration, which increased the affordability of child rearing for high skilled US natives.

We start by writing a statistical model that allows the fertility-FLFP correlation, a macro concept, to be interpreted in terms of individual fertility and work decisions. We then examine variation across US metropolitan areas over time to assess the degree to which low skilled, mostly Hispanic immigrant inflows attenuated the negative correlation between childbearing and FLFP among college educated non-Hispanic natives. This differentiation by skill and ethnicity allows us to draw on a commonly used instrumental variables approach to isolate a causal channel of influence of immigrants on the outcomes of natives via the cost of local household services. Finally, we describe how our estimates of the effect of low skilled immigration on the correlation coefficient can be used to calculate concrete impacts on joint childbearing and labor force participation outcomes.

I. Interpreting the Correlation between Fertility and Labor Force Participation

Consider the fertility (C) and labor force participation (L) outcomes within a group of women, where groups might be defined by location, time, age, and other characteristics. Let C_i^* and L_i^* denote the desirability of childbearing and labor supply, respectively, for woman i who is a member of the group. A bivariate model of outcomes is

$$(1) \quad C_i = I(C_i^* > 0) \text{ with } C_i^* = \mu^C + \varepsilon_i^C,$$

and

$$(2) \quad L_i = I(L_i^* > 0) \text{ with } L_i^* = \mu^L + \varepsilon_i^L$$

where $I(\cdot)$ is used to denote the indicator function and $\mu^\cdot$ denotes a group-by-time mean, which may be a function of common covariates.

If the error terms in (1)–(2) follow a standard bivariate normal distribution, then $\rho = \text{corr}(\varepsilon_i^C, \varepsilon_i^L)$ is the *tetrachoric* correlation

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between fertility and FLFP within the group.[1] Additionally, we may write $E[L_i^* | \varepsilon_i^C] = E[L_i^*] + \rho\varepsilon_i^C$ and a similar expression for C_i^*. Hence, ρ measures the extent to which within-group heterogeneity in desired fertility translates into differential desired labor force participation, and vice versa. This might reflect, for example, the effect of an unintended pregnancy on desired labor supply or the effect of a layoff on the desirability of childbearing. As such, we expect the correlation to be negative.

We estimate the tetrachoric correlation based on the group level empirical approximation of the joint likelihood:

$$(3) \qquad p^{CL} = F(\Phi^{-1}(p^C), \Phi^{-1}(p^L), \hat{\rho}),$$

where p^C, p^L, and p^{CL} are the observed proportions of women who bear children, work, and do both, respectively, and $F(\cdot)$ denotes the bivariate normal distribution function. Since $F(\cdot)$ is monotonic in the third argument, equation (3) implies that, conditional on the observed marginal sampling frequencies, there is a (positive) one-to-one relationship between the tetrachoric correlation and the joint likelihood of work and fertility.[2]

Using data from the March Current Population Surveys (CPS) (Miriam King et al. 2009) on women ages 18–39, Figure 1 plots the smoothed time-series from 1970 to 2000 of the correlation between participating in the labor force and having a child younger than one in the household; we will use this definition of fertility throughout the paper. In the full sample of adult fecund women, the correlation between fertility and FLFP was less than -0.4 in 1970 but rose above -0.3 by 2000. The weakening of the correlation was even more pronounced for highly-skilled women: although the correlation was 50 percent more negative for college
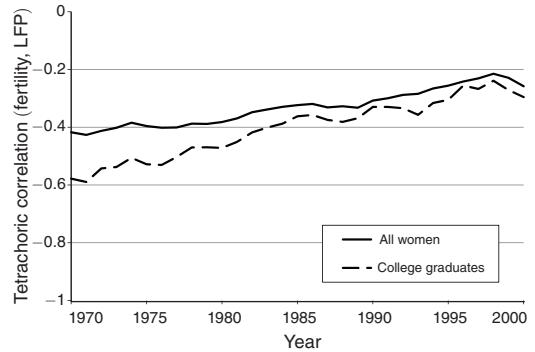

FIGURE 1. ESTIMATED CORRELATION BETWEEN FERTILITY AND LABOR FORCE PARTICIPATION, 1970–2000

Notes: The figure depicts 3-year centered moving averages based on labor force participation rates and fertility rates of women ages 18–39 from the 1969–2001 March CPS.

graduates in 1970, by 2000 there was almost no difference between college graduates and the full sample.

II. Low Skilled Immigration and the Correlation between Work and Fertility

In attempting to explain the changes in work and fertility, it seems reasonable to consider changes in the costs of childrearing. We focus on the influence of low skilled immigration, which Patricia Cortes (2008) showed to lower the costs of nontraded services in US cities. Since this may have resulted in cheaper substitutes for women's time in home production, Cortes and Jose Tessada (2009) and Lídia Farré, Libertad Gonzalez, and Francesc Ortega (2009) explore the effect of low skilled immigration on labor supply decisions of US and Spanish natives, respectively. In this paper, we consider how low skilled immigration may have affected the correlation between work and fertility using the parameterization:

$$(4) \qquad \hat{\rho}_{amt} = \beta LSI_{mt} + \theta' \mathbf{X}_{amt} + e_{amt}$$

where $\hat{\rho}_{amt}$ is the estimated tetrachoric correlation between work and fertility among women in age group a in metropolitan area m in year t, $\mathbf{X}_{amt}$ is a vector of the group's characteristics, LSI_{mt} denotes the low skilled (high school diploma or

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[1] Most empirical studies of the correlation between FLFP and fertility rely on the Pearson product-moment-based *phi* correlation. This measure is somewhat problematic because it may not range fully from -1 to $+1$ and the range of values it can take is affected by the marginal frequencies of the underlying binary outcomes. By contrast, the tetrachoric correlation does not depend on the marginal distributions (Warrens 2008).

[2] Since there is no closed-form solution for $\hat{\rho}$, this allows us to apply a recursive binary chop algorithm to find the value that makes equation (3) hold approximately (precision $= 2^{-50}$).

less) immigrant share of the local working age population in year t, and e_{amt} represents other unmodeled determinants of the correlation. If an increase in *LSI* results in cheaper and more available market-based household services, we expect β to be positive. That is, low skilled immigration should dampen the negative effect of fertility shocks on labor supply and of labor supply shocks on fertility.

Our primary source of data is the 1980–2000 US Census Five-percent Public Use Microdata Sample (PUMS) files (Steven Ruggles et al. 2009); supplemental data from 1970 PUMS files were used to construct the instrumental variable. In order to address the changes in geographic boundaries of certain Census-defined metropolitan areas (MAs) over the years, we started with the 100 largest MAs and recoded the underlying sampling units to generate a sample of 70 consistently defined metropolitan areas.[3] As seen in Figure 2, all MAs appear to have experienced a decline in wages in the child care sector, relative to income per capita among local male college graduates. However, in MAs experiencing greater growth in the low skilled immigrant share of the working age population between 1980 and 2000, declines in this normalized wage measure were generally steeper. This suggests that low skilled immigration lowered child rearing costs in the United States. Hock and Furtado (2009) provide a more formal evaluation of the impact of low skilled immigration on various wage quantiles in the child care sector, as well as in the food preparation and housekeeping sectors, finding significant negative effects across the board.

To examine whether low skilled immigration consequently reduced fertility-work tradeoffs, we estimate equation (4) for our sample between 1980 and 2000. To limit the possibility that immigration's effect on native women operates through competition in the labor market or social norms regarding fertility and work, we consider only the outcomes of non-Hispanic women with college degrees. We additionally restrict the sample to women not enrolled in school. In all specifications, we use two age groups (23–30 and 31–39) per metropolitan area and include age group, MA, and region-by-year
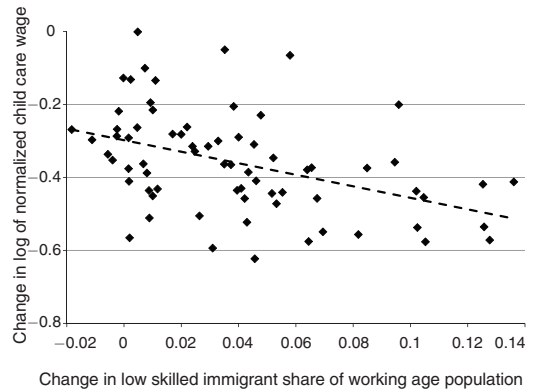
[3] This sample of metropolitan areas was constructed in a manner similar as described in Hock and Furtado (2009).

FIGURE 2. LOW SKILLED IMMIGRATION AND WAGES IN CHILD CARE, 1980–2000

Notes: The figure depicts within metropolitan area changes between 1980 and 2000 based on data from the US Census PUMS files. The "normalized" child care wage in a metropolitan area is the median wage of local child care workers divided by income per male college graduate.

fixed effects. We also control for group level demographic variables that may mediate the relationship between fertility and work decisions, namely, the proportion of the group that is married, the proportion that is black, and the proportion that identifies as another nonwhite race.

The main concern in obtaining a causal estimate of β is that current local socioeconomic conditions may affect immigrants' location decisions as well as the family and work choices of natives. We first address this by adding a control for the average income of college educated males (*IncControl*) to capture time-varying economic fluctuations that may affect, but are unlikely to be affected by, the location choices of low skilled immigrants. Ultimately, we adopt David Card's (2001) instrumental variables approach, which is based on the tendency of new immigrants to be drawn to cities with higher pre-existing concentrations of coethnics. The instrument is $INST_{mt} \equiv \sum_b \phi_m^b \times \Delta_t N^b$, where ϕ_m^b is the proportion of immigrants from country of birth b living in metropolitan area m in 1970, and $\Delta_t N^b$ is the inflow of low skilled working age adults from country b between 1970 and time t. In order to maximize the predictive power of the instrument, we chose immigrant groups with US populations of at least 20,000 in

1970 and for which $\Delta_{2000}N^b$ was positive.[4] To minimize the possibility of direct labor market competition with the high skilled native women in our sample, we limited immigrant groups to those in which the majority of the inflow through 2000 was low skilled. The resulting set of sending countries consisted of the Dominican Republic, Ecuador, Haiti, Mexico, and Portugal.

As seen in Table 1, the basic relationship between *LSI* and ρ in the sample of US native non-Hispanic college graduates is positive. This indicates that increases in the share of the population comprising low skilled immigrants may well have attenuated the negative latent correlation between fertility and work. Adding the control for male college graduate income per capita yields a substantially larger estimate of β and a negative coefficient estimate on *IncControl*. These results suggest that immigrants are drawn to areas in which higher incomes among male college graduates result in more of their potential spouses dropping out of the labor force to bear children. Moving to the instrumental variables estimates, which better capture the effects of immigrant inflows unrelated to current local socioeconomic conditions, we see an even stronger dampening effect of low skilled immigrants on the tetrachoric correlation. This points to low skilled immigrant labor as a moderator of the negative impact of fertility (labor supply) shocks on labor force participation (childbearing) outcomes among native college graduates.

III. Discussion and Conclusion

This paper has explored the effect of low skilled immigration on the association between work and fertility of high skilled native women in the United States. Our empirical estimates relating low skilled immigration to the tetrachoric correlation suggest that college educated women living in cities with larger inflows of foreign born workers experience a substantially smaller tradeoff between work and fertility. This result certainly points to low skilled immigration as a partial explanation for the outlier status of the United States, relative to other developed countries, in terms of high fertility and female

TABLE 1—LOW SKILLED IMMIGRATION AND THE TETRACHORIC CORRELATION, HIGH SKILLED NON-HISPANIC NATIVE FEMALE SAMPLE, 1980–2000

	OLS		IV
Variable	(1)	(2)	(3)
Low skilled immigrant share of the working age population	0.575* (0.245)	0.740** (0.252)	0.845** (0.307)
Log of income per capita, male college graduates		−0.291** (0.082)	−0.299** (0.079)

Notes: See text for a description of the data, the sample, and the baseline demographic covariates and fixed effects included in all specifications. The numbers of observations per age-group/metropolitan-area cell ($N = 420$) were used as weights, and the standard errors in parentheses were clustered by metropolitan area.

 ***Significant at the 1 percent level.
 **Significant at the 5 percent level.
 *Significant at the 10 percent level.

labor force participation rates despite the lack of family-friendly social policies (Brewster and Rindfuss 2000). Future research might explore this conjecture using cross-country data.

In order to connect our results on the tetrachoric correlation to measurable outcomes, we may rely on equation (3), which relates $\hat{\rho}$ to the observed joint rate of childbearing and labor force participation, p^{CL}. The average partial effect associated with the flow of low skilled immigrants to the average high skilled woman's MA between 1980 and 2000 implies a 0.2 percentage point increase in the joint likelihood of fertility and work. This corresponds to 8.6 percent of the 2.3 percentage point rise in the joint likelihood observed over that time frame. In addition to its impacts on the tetrachoric correlation, low skilled immigration is likely to affect the (marginal) rates of childbearing and FLFP, which may, in turn, lead to additional changes in p^{CL}. A richer model that also accounts for differential changes in fertility and labor force participation in response to low skilled immigration could yield an even larger estimated total increase in the number of working mothers.

In both academic and policy circles, the US immigration debate has largely focused on the extent to which immigrants decrease natives' employment levels and wages. Little emphasis has been placed on the potential benefits of

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[4] The first-stage F statistic for the IV specification in Table 1 was 26, which exceeds commonly used thresholds for evaluating instrument strength.

immigration to natives. Our findings suggest that inflows of low skilled immigrants have made it easier for high skilled US born women to pursue careers without having to sacrifice family life—surely an often ignored benefit of immigration.

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