

# The Labor Supply of Immigrants in the United States: The Role of Changing Source Country Characteristics

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The role that source country characteristics has in determining the labor market performance of immigrants has long been explored by economists. For example, Borjas J. Borjas 1987 models the migration decision as determined by expected difference in the immigrant's position in the earnings distribution in the host and source countries. Deborah A. Cobb-Clark 1993 extends Borjas' model to immigrant women. Similarly, other studies explore how culture or traditional gender roles in the source country persist across borders and influence the labor market outcomes of immigrant women in the U.S. For example, Heather Antecol 2001, 2000 and Francine D. Blau, Lawrence M. Kahn, and Kerry L. Papps 2008 find a positive relationship between source country characteristics and the labor market outcomes of immigrant women in the U.S. However, absent from the existing literature is an examination of how changes over time in a source country's characteristics are associated with changes in the labor market outcomes of immigrants from that source country.

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In this paper, we study how changes in the source country characteristics are associated with changes in the labor supply outcomes of immigrants in the U.S., and whether these relationships are different across men and women. In particular, we focus on the changes in three labor supply outcomes: labor force participation rate (LFPR), employment to population rate, and number of weekly hours of work. Again, because we are interested in differences across gender we focus on changes in the gender gap in each labor supply outcome. Our source country explanatory variables include the changes in the gender LFPR gap, fertility rates, gross domestic product per capita, and the percent of the population living in cities with a population greater than 1 million. Finally, we answer the question of whether or not the relationship between changes in source country variables and changes in host country outcomes is driven by changes in the demographic characteristics of immigrants.

We examine changes in source country characteristics rather than focusing on levels as the previous literature does. We argue that this is preferable when analyzing the relationship between source country characteristics and the labor market performance of immigrants as we are implicitly controlling for differences in immigrants' outcomes within the country of origin, as well as other possible source country time invariant confounding factors. Further, this allows us to better understand whether the relationship between changes in the outcomes of immigrants and changes in source country characteristics is driven by changes in an immigrant's demographic attributes. In addition, we compare the outcomes of immigrants across gender, highlighting the differences between men and women. In the United States alone, women comprise slightly more than half of the U.S. foreign-born population. Despite their significant share, comparative studies of the labor market outcomes of immigrant women relative to immigrant men remain largely unexplored. Finally, unlike previous studies,

we examine the labor market outcomes of female economic migrants. Thus, we focus on the outcomes of single immigrant women or women who migrated without a spouse. As marriage and fertility rates have declined within several countries, the prevalence of "tied movers" is diminishing and women are more likely to migrate now as a response to economic incentives.

## 1 Data

Our primary source of data is the 1990 and 2000 U.S. Census 5-percent Public Use Microdata files . We restrict our sample to foreign-born individuals between the ages of 25-65 who migrated to the United States within ten years of the Census year. In addition, we restrict our female sample to "single immigrant women". Single immigrant women are classified as follows: single or divorced; if married having a husband who was born in a different country, or having arrived to the U.S. prior to her husband's arrival, regardless of nationality. Thus, we attempt to focus on women who are migrating in response to economic incentives as opposed to "tied movers" who migrate to accompany their spouses. In contrast, we do not sub-select men from the sample. Finally, the sample is restricted to countries with two hundred and fifty or more women observations in each Census survey, which leaves us with immigrants from 37 different countries. Our outcome variables are the 1990-2000 change in the gender LFPR gap, gender employment gap, and gender hours of work gap. Source country data are taken from the World Bank World Development Indicators (WDI). Since we are examining changes in source country characteristics, we only use data on countries whose variables are consistent between 1980 and 1990, and as noted above we focus on countries that represent a significant share of immigrants in the U.S. Our explanatory variables are gender LFPR gap, fertility rate, GDP

per capita, and the proportion urban.<sup>1</sup>

## 2 Empirical Specification

Our strategy in this paper is to concentrate on labor market gender gaps in the host country, rather than on women or men separately, because this strategy allows us to understand how the changing labor market conditions in the source country affect the outcomes of women relative to men – that is men are informally acting as a control group. We begin by estimating the following ordinary least squares regression, separately for each country-year-gender combination ( $J$  countries x 2 Years x 2 Male or Female):

$$Y_{iJT} = \alpha + x'_{iJT}\beta + \epsilon_{iJT} \quad (1)$$

where  $Y_{iJT}$  is the measured U.S. outcome of individual  $i$ , living in country  $J$ , and in year  $T$  ( $T=1990$  and  $2000$ ). The vector  $x'$  includes the following basic demographic information: age, age square, four dummies for education categories (High School Dropouts [omitted], High School Graduates, Some College, College Graduates); dummies for years in the U.S. (1-2 years [omitted], 3-4 years, 5-7 years, 8-10 Years; and whether the immigrant is married at the time of the survey. From equation (1) above we predict  $\hat{Y}_{J2000}$  and  $\hat{Y}_{J1990}$  for men and for women. The first prediction is the value of the outcome variable estimated at the sample mean of each explanatory variable for immigrants from country  $J$  in the 2000 Census, while the second prediction is the value of the outcome estimated at the sample means of immigrants from country  $J$  in the 1990 Census. Similarly, we estimate  $\hat{Y}_{J2000}^{1990}$  which is the predicted value for the regressions in

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<sup>1</sup>When analyzing GDP per capita we have missing values for the following countries: Cuba in both years and Poland, Russia, and Vietnam for 1980. This reduces our sample size to 33. Summary statistics for both data sets are available at [www.economics.pomona.edu/lozano](http://www.economics.pomona.edu/lozano)

the response and explanatory variables in 2000, but using the sample means of the immigrant sample in 1990 in the prediction. We refer to the first estimates as our unadjusted estimates, and the latter we refer to as the adjusted estimates.

Second, to estimate how changes in the source country are associated with changes in the outcomes of immigrants from that source country, we estimate the following country-level bivariate equations :

$$(\hat{\gamma}_{j2000} - \hat{\gamma}_{j1990}) = \omega + \theta(Z_{j1990} - Z_{j1980}) + v_j \quad (2)$$

$$(\hat{\gamma}_{j2000}^{1990} - \hat{\gamma}_{j1990}^{1990}) = \omega^{1990} + \theta^{1990}(Z_{j1990} - Z_{j1980}) + v_j^{1990} \quad (3)$$

where  $\hat{\gamma}_{j2000} = \hat{Y}_{j2000}^m - \hat{Y}_{j2000}^f$  and  $\hat{\gamma}_{j1990} = \hat{Y}_{j1990}^m - \hat{Y}_{j1990}^f$ . In the above equation  $\theta$  measures how changes in the source country characteristics  $Z_{jt}$  are associated with changes in the labor market outcomes of immigrant women relative to immigrant men. Similarly,  $\theta^{1990}$  measures how changes in the source country characteristics are associated with the changes in the labor supply outcomes of immigrant women relative to men, if the demographic characteristics of immigrants had stayed the same between both Census years and only the returns to those characteristics were changing. Thus, the difference between  $\theta$  and  $\theta^{1990}$  represents the extent to which the relationship between changes in  $Y$  and changes in  $Z$  is due to changes in the demographic characteristics of the immigrants.<sup>2</sup>

This strategy allows us to take advantage of three types of variation in the labor market outcomes of immigrants: first, there is variation in our outcome variables across countries. Second, there is variation in the variables within a country across time. Finally, there is variation in outcomes across gender.

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<sup>2</sup>Appendix 1 and 2, available at [www.economics.pomona.edu/lozano](http://www.economics.pomona.edu/lozano), show the predicted values for men and women for our three labor supply outcome variables (LFPR, employment, and hours worked) estimated at the sample means of immigrants from country  $J$  in year  $T$  ( $T=1990$  and  $2000$ ).

Thus, the variation in the estimates presented in Appendix 1 and 2 strengthen our justification for examining changes across time and gender. We now turn to our results from equations 2 and 3, where we explore these variations and the extent to which the variations in our outcome variables are driven by changes in source country characteristics.

### 3 Results

Results from equations 2 and 3 are presented in Table 1. Recall that each cell in the Table is a coefficient estimate from equation 2 and 3, and the bootstrap robust standard errors are presented in parenthesis. Column 1 presents the unadjusted estimates for the source country explanatory variables when the response variable is the change in the immigrant's gender LFPR gap. The second column presents the adjusted estimates when the response variable is the change in the immigrant's gender LFPR gap holding the demographic characteristics of the immigrants in the 2000 Census fixed to those of the 1990 Census. Similarly, the third (fourth) column shows the coefficients when the response variable is the unadjusted (adjusted) change of the gender employment-population gap, and the fifth (sixth) column presents estimates when the response variable is the unadjusted (adjusted) change of the gender gap in weekly hours of work. The four rows in Table 3 present estimates for each of our explanatory variables.

The results suggest that when the source country gender LFPR gap increases, the employment gender gap increases as well. That is, when women in the source country become less likely to be in the labor force (*an increase in the source gender LFPR gap*) immigrant women from that country will be less likely to be employed in the U.S. as well (*an increase in the immigrant's gender employment gap*). Conversely, decreases in the source country gender LFPR gaps will predict smaller immigrant gender employment gaps (*immigrant*

Table 1: Ordinary Least Squares Coefficients

	Labor Force (1)	Labor Force <sup>90</sup> (2)	Employed (3)	Employed <sup>90</sup> (4)	Hours (5)	Hours <sup>90</sup> (6)
$\Delta$ Gender LFPR Gap	0.096 (0.087)	0.145 (0.100)	0.198* (0.099)	0.220* (0.113)	11.728* (5.096)	17.646* (5.804)
$\Delta$ log GDP per Capita	-0.049* (0.025)	-0.032 (0.025)	-0.055* (0.030)	-0.040 (0.037)	-2.957* (1.252)	-1.970 (1.609)
$\Delta$ Fertility Rate	0.001 (0.014)	0.012 (0.013)	0.017 (0.014)	0.029* (0.016)	0.245 (0.742)	1.029 (0.767)
$\Delta$ Proportion Urban	-0.327 (0.254)	-0.248 (0.222)	-0.496 (0.317)	-0.452 (0.332)	-13.831 (15.361)	-16.005 (11.579)

\* Denotes statistically significant at 10% confidence level (N=37).

Bootstrap standard errors presented in parenthesis (50 repetitions)

Sample: All immigrants who migrated to the U.S. within 10 years of the Census survey year and

between the ages of 25-64. Women are further selected as those who migrated as non-married.

*women will be more likely to be employed*). There is little difference here between  $\hat{\theta}$  and  $\hat{\theta}^{1990}$  which suggests that little of the variation in this relationship is explained by changes in the demographic characteristics of immigrants. Similarly, a rise in the source country gender LFPR gap increases the hours gap: a ten percentage point increase in the source gender LFRP gap is associated with a 1.2 hours increase in the unadjusted gender hours gap, and a 1.8 hours increase in the adjusted gender hours gap. Surprisingly, the source country gender LFPR gap does not predict any changes in the immigrant gender LFPR gap. This last result suggests that cultural factors which affect the gender LFPR, and that are transmitted across the migration process (Blau et al. 2008; Antecol, 2001), are likely to be time invariant.

In contrast, increases in the change of per capita income in the source country are associated with a narrowing of the immigrant gender LFPR gap, gender employment gap, and gender hours gap. In particular, a 10 percent increase in the change in GDP per capita is associated with a decline in the gender

LFPR gap of .005 percentage points, a decline in the gender employment gap of .005 percentage points, and a decline in the gender hours gap of .30 hours. Importantly, once that we control for changes in demographic characteristics between the 1980-1990 and 1990-2000 immigrant cohorts, these estimates attenuate towards zero and become statistically insignificant. This suggests that the relationship between changes in log GDP per capita in the source country and changes in the gender gaps in immigrant labor supply outcomes in the U.S. are mostly due to changes in the demographic characteristics of immigrants. Finally our last two variables: changes in the source country fertility and changes in the proportion living in urban areas, explain none of the changes in the immigrant labor supply gender gaps. This does not necessary mean that the variables are not correlated with immigrant's labor supply, just that the relationship is not different for women relative to men.

When analyzing gender gaps in labor market outcomes it is not clear whether the changes are due to the changing outcomes of immigrant women or immigrant men. For example, in Table 1 our results showed that when the source country gender LFPR gap increased, the employment gender gap among immigrants in the U.S. increased as well. However, it may be possible that the increase in the employment gender gap could be driven by larger changes in the labor market outcomes of women relative to men. In order to provide greater insight into which group (men or women) is contributing more to the changes in our outcome variables, we re-estimate equations 2 and 3 restricting the data to women, now the dependent variable is  $\hat{\delta}_j^f = \hat{Y}_{j2000}^f - \hat{Y}_{j1990}^f$ . This allows us to estimate the relationship between changes in source country variables and changes in the outcome variables between women in the 2000 Census who migrated between 1990 and 2000 and women in the 1990 Census who migrated between 1980 and 1990. As in Table 1, we also measure how changes in the source country charac-



Table 2: Ordinary Least Squares Coefficients For Immigrant Women

	Labor Force (1)	Labor Force <sup>90</sup> (2)	Employed (3)	Employed <sup>90</sup> (4)	Hours (5)	Hours <sup>90</sup> (6)
$\Delta$ Gender LFPR Gap	-0.093 (0.192)	-0.100 (0.137)	-0.092 (0.179)	-0.074 (0.148)	-8.765 (8.253)	-15.986* (6.553)
$\Delta$ GDP per Capita	0.127* (0.024)	0.077* (0.034)	0.115* (0.028)	0.068* (0.038)	2.043* (1.271)	.777 (1.454)
$\Delta$ Fertility Rate	0.055* (0.028)	0.025 (0.025)	0.048* (0.024)	0.014 (0.022)	1.528 (.944)	.514 (.755)
$\Delta$ Proportion Urban	-0.323 (0.327)	-0.289 (0.301)	-0.246 (0.284)	-0.147 (0.369)	-15.264 (10.543)	-15.218 (13.342)

\* Denotes statistically significant at 10% confidence level (N=37).

Bootstrap standard errors presented in parenthesis (50 repetitions)

Sample: All female immigrants who migrated to the U.S. unmarried within 10 years of the Census

survey year and between the ages of 25-64.

teristics are associated with changes in the labor market conditions of immigrant women, if the demographic characteristics of female immigrants had stayed the same between both Census years and only the returns to those characteristics were changing. The estimates from these regressions are presented in Table 2.

The results suggest that changes in the source country gender LFPR gap do not affect the changes in the labor supply outcomes between 2000 Census immigrant women and 1990 Census immigrant women. However, according to Table 1, an increase in the source country gender LFPR gap increases the gender employment and hours worked gaps among immigrants in the U.S. Thus, the increase in the gender employment and hours worked gaps must be due to changes among immigrant men. On the other hand, increases in GDP per capita in the source country are associated with an increase in the labor force participation rates of immigrant women from that country. Note that this relationship, attenuates to half once we control for differences in observable characteristics, but remains positive and statistically significant. This suggests that as a country becomes wealthier, immigrant women from this country will be

more likely to be in the labor force and be employed. This is partly due to demographic characteristics, perhaps as the country becomes wealthier women invest in skills that are transmittable between source and host country, but it is also due to a change in the prices to those characteristics. Finally, changes in the source country fertility rates are also positively (and perhaps surprisingly) associated with changes in the labor force participation and employment rates of women. That is, as a country's fertility goes down, so does the probability that an immigrant woman from that country participates in the host country labor market. Nonetheless, those coefficients attenuate to zero one we control for the demographic characteristics.

It is worth noting here that it is not intuitive to us why changes in the gender LFPR gap in the source country affect the outcomes of immigrant men and not those of women, and we can only hypothesize that perhaps this relationship is being driven by some unobserved factor. The results in the second row, those for log GDP per capita, suggest that this factor must be other than income, as changes in GDP per capita are associated with changes in women's labor supply. Comparing the first row in Tables 1 and 2, suggests that among immigrants from countries where the gender LFPR gap is increasing, men are increasingly more likely to be working or to work long hours. Women are not. This puzzle remains a topic for future study.

## 4 Summary

This paper highlights that changes in the source country characteristics are important in determining the demographic characteristics of the immigrant population. We find that there is a positive relationship between changes in the gender LFPR gap in the source country and changes in the gender employment and hours worked gaps among immigrants in the U.S. This result is consistent

with Antecol 2000 and Blau et al. 2008 in that source country characteristics can persist across borders. We also find that changes in the gender labor force participation gap are not associated with changes in the labor supply of immigrant women. This result suggests that to the extent that labor force participation rates represents the source country's culture and attitudes, this variable will be time invariant and it will not be likely to affect the changes in the outcomes of immigrants. Furthermore, we find that increases in the source country GDP per capita are associated with a decline in the labor supply gender gaps, and this relationship disappears once we control for demographic characteristics. Finally, we find that changes in the source country fertility rate is also positively correlated with immigrant women's labor force participation and employment rates, but the magnitude of this relationship halves once that we control for observable characteristics.

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