

# *The Long Run Development Impacts of a Guest Worker Program: Evidence from the Bracero Program*

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**Abstract:** The Bracero Program was a historical guest worker program between Mexico and the United States that saw the temporary migration of nearly five million agricultural workers to the United States. These guest worker programs benefit the host country with cheaper labor and the sending communities with influxes of cash earned abroad. The Bracero Program provides an opportunity to understand the long term development impact of such a policy. I compare the adult outcomes of those children who were treated with exposure to the program to those children who were not exposed. I utilize two methods to isolate plausibly exogenous variation and estimate this effect. One is a family fixed effects model that compares siblings, and the other is a difference-in-differences model that exploits a natural experiment in the institutional history of the program. Positive effects in the long run provide further evidence of guest worker programs as good development policy.

**JEL Classification:** J15; J24; J08; O15; N36

**Keywords:** Guest Worker Program; Human Capital; Education; Mexico; Bracero Program

*Preliminary and Incomplete – Not for Citation or Dissemination*

## *Introduction*

The Bracero Program was a guest worker program between Mexico and the United States from 1942 until 1964. It allowed for the migration of nearly five million agricultural workers. They worked under contract for a short period of time at a set wage, and then returned to Mexico with money in their pockets.<sup>1</sup> Fast forward 50 years and much of the debate over comprehensive immigration reform in the United States includes some discussion of the implementation of a guest worker program. Development economists cite short term successes for contemporary guest workers as a reason to believe that these programs would be good development policy.<sup>2</sup> I perform an appraisal of the development impacts of a historical guest worker program to better understand whether or not we can expect long run benefits for participants of the more recent programs.

One way to assess the long run benefits of the program is to look at the eventual adult outcomes of the children of those who migrated to the United States as braceros. Our concept of economic development has changed from one of just increases in per capita income to a paradigm of human development (e.g., improvements in health and education).<sup>3</sup> If this program resulted in investments that created sustained increases in human capital (e.g., health, education, etc.) for the children of participants, then one could claim it was, and continues to be, a long run success in Mexico.

Specifically, in this paper, I compare adult outcomes (e.g., years of education, occupation, health indicators, etc.) for those who were “treated” by exposure to the Bracero Program as a child in their formative years to those who were not. I consider two different, yet

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<sup>1</sup> See Galarza (1964) for a description of the Bracero Program.

<sup>2</sup> See Clemens and Pritchett (2013).

<sup>3</sup> Consider, for example, the United Nation’s Millennium Development Goals (MDGs) (<http://www.un.org/millenniumgoals/>).

related types of treatment. In the first case, I consider a child treated with exposure to the program if their father migrated to the United States as a bracero during their formative years of development, and untreated if they were too old at the time their father migrated. In the second case, I consider a child treated with exposure to the program if they were living in a place a particular time that made it more likely for their father to migrate as a bracero (i.e., near a recruitment center), and untreated if they were not.<sup>4</sup> If there is an economically and statistically significant advantage for those who were treated, this would be evidence that the program had a positive, long term impact on the economic well-being of poor households in Mexico.

One contribution of this work will be to produce a more complete understanding of the historical impact of the Bracero Program. Most of the work in other literatures takes a very negative view of this program.<sup>5</sup> More recent work, however, shows evidence of the short term, positive impacts of the program.<sup>6</sup> This project will highlight additional benefits to create a more comprehensive, historical appraisal of the Bracero Program.

A second contribution will be to provide policymakers with evidence of the positive development impacts of good migration policy. Guest worker programs, both historical and contemporary, have short term, positive impacts on participants and their households.<sup>7</sup> However, no one has assessed the long run impact of these programs on development in the sending communities. This is an example of a problem that history has an advantage in solving. Since

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<sup>4</sup> This has not yet been completed, but is described in the future work section of the paper.

<sup>5</sup> See Galarza (1964), Massey and Liang (1989), Reichert and Massey (1982), Rosas (2011), and Sandos and Cross (1983) for examples highlighting negative impacts on participants.

<sup>6</sup> See Kosack (2016) for a review regarding the Bracero Program, as well as Gibson and McKenzie (2010) for the positive impacts of more recent guest worker programs.

<sup>7</sup> See Antman (2011), Antman (2015), Hanson and Woodruff (2006), Hildebrandt and McKenzie (2005), McKenzie and Rapoport (2011), Woodruff and Zenteno (2007), and Yang (2008) for studies of the impacts of migration. See Kosack (2016) and Gibson and McKenzie (2010) for the short term impacts of guest worker programs.

the program was in place several decades ago, I can fill this gap by looking at long run effects; namely, the eventual adult outcomes of those who were exposed as children. If the positive effect of the program can be shown to have been sustained over a long period of time, then one can argue its benefits are even greater than previously imagined. This is an important step in assessing whether or not guest worker programs can be good development policy tools today.

This is exciting, new work that builds on previous studies I have conducted to identify the short run impacts of the Bracero Program.<sup>8</sup> We know from these studies that braceros used their monies earned abroad to invest in themselves and in their children in the very short run. The bigger question, however, “Were these very temporary, albeit large, influxes of cash into the household sufficient to make the necessary investments to change lives for the better in the long run?” If that is the case, then guest worker programs are powerful tools in conducting development policy.

### ***Background***

For an in depth description of the Bracero Program, its operation, administration, and institutional history, please see Kosack (2016). The Bracero Program was a guest worker program between the United States and Mexico that lasted for 23 years, from 1942 until 1964. It was born out of a labor shortage in the United States, stemming from World War II. An increase in the demand for agricultural products and decrease in the supply of workers in the fields, both resulting from the war, spurred farmers to demand some action. The Bracero Program, although starting as a wartime program, obviously lasted well beyond. This program was actually a series of several bilateral agreements signed between the two nations over this time period. This is important because it provides variation over time in the operation and administration of the

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<sup>8</sup> See Kosack (2016) for two specific examples of studies that identify the positive, short run impacts of the program on migrants and their children.

program. Over the lifetime of this program, between four and five million agricultural workers migrated to the United States to work temporarily as braceros, making it the largest guest worker or temporary worker program in the migration history of the United States.

The Bracero Program was a bilateral effort between Mexico and the United States that was designed to operate in a very specific way. Farmers or farmer associations in the United States would request the opportunity to recruit workers from Mexico, citing difficulties in hiring domestic labor at the prevailing wage. If the request was certified by the government in the United States, the request for workers would be sent down to a recruitment center in Mexico. In Mexico, individuals who desired to work temporarily in the United States would travel from their home to the nearest recruitment center. Either they would go with a *permiso* from the local government official, or they would simply go hoping to be granted a contract. After arriving at the recruitment center, having undertaken the journey at their own cost, they would wait in long lines to be called for a contract. The recruitment centers in Mexico are where worker met contract.

Once the worker obtained a contract, he would be transported at the cost of the employer to his place of employment in the United States. There he would work for the contracted amount of time, at the specified wage and doing the specified tasks. Other benefits were supposed to be provided, including room and board, insurance, transportation costs to the United States and back to the recruitment center in Mexico, etc. Once the contract was completed (anywhere from three to nine months) the worker would be transported back to Mexico. He could either wait in line for another contract, or decided to return to his family. There is very little wage evidence that exists for these braceros, although the best guess is that the daily wage in the United States was nearly seven to nine times what the worker could have earned back in Mexico. Much of the

literature available focuses on the abuses that occurred as part of this program. Those did occur and they are well-documented. This paper, however, will focus on the benefits that emerged, despite those abuses, from the process described above.

## ***Data and Methods***

### *Data*

The data for this paper come from the Mexican Migration Project (MMP), a database maintained through a joint effort by Princeton University and the University of Guadalajara. This is a survey of households in Mexico in 154 different communities. The communities are not chosen at random as they are selected for being in high-migration areas, but the households are selected randomly within the communities. Thus, it should not necessarily be thought of as a representative sample for all of Mexico. This is a very rich database, with information collected on the head of household and his or her family, including detailed migration histories, demographic information, educational outcomes, occupational outcomes, and much more. I use the information in this database to construct my sample.

For this paper, I create a sample of individuals who had a father that migrated to the United States as a guest worker during the Bracero Program from 1942 to 1964. Households are eliminated from my sample if the head of household is not a male who made his first migration to the United States as a bracero. After identifying the targeted households in the survey, I calculate the age at father's first migration (as a bracero given the construction of the sample of households) for each child (i.e., year of birth subtracted from year of father's migration). Using this calculated age at father's first migration, I categorize individual children according to how old they were at exposure (e.g., unborn, 0-5 years old, 6-11 years old, 12-17 years old, and over 18 years old). Individual children are dropped when data on year of birth is either missing or

coded as unknown. This process yields a sample of 7,027 individuals in 1,008 different households.

I present the summary statistics for my sample in Table 1. The children of bracero migrants had, on average, seven completed years of education. The majority of the children, 84.6 percent were unborn at the time of their father's first migration to the United States as a bracero. Of the remaining 15.4 percent that were born, the overwhelming majority were very young and under six years of age. Although most were unborn, there is some variation in the age of exposure to their father's first bracero trip to the United States. Lastly, 49 percent of the children of bracero migrants in this sample were female and 51 percent were male. This not only paints a picture of what the children of bracero migrants looked like, but also provides a good comparison against which to scale the estimated effect.

### *Empirical Strategy*

One of the biggest problems when estimating the effect of migration on some outcome is the obvious endogeneity problem coming from self-selection into migration; those that migrate or those who had parents who migrated are likely different than those who did not. In this paper, I do two different things to ameliorate the bias that could come from selection into the decision to migrate. First, I restrict the sample of children to those who had a father who made his first migration to the United States during the Bracero Program. Thus, the comparison I make is one of "apples-to-apples" as I only compare the children of migrants (eliminating any bias from eventual selection into migration) and I only compare those who chose a very particular type of migration under the Bracero Program. Additionally, any estimated effect from this sample will be a treatment on the treated (TOT) or an impact for those who decide to take up guest worker migration to the United States under the Bracero Program.

Since I am not relying on a comparison between the children of migrants and non-migrants, a different source of variation is required to identify the effect of a father's migration as a guest worker on his children's eventual educational attainment. In this paper, I rely on the timing of the father's first migration to the United States under the Bracero Program, comparing children that are born before their father made this trip to children who were born after their father made that trip. Although there is no potential for selection bias from deciding to migrate or not, there could still be some selection bias as to when the individual decides to migrate. The second method I use to mitigate any remaining selection is to utilize a household fixed effects model to identify the effect. By including a household or family fixed effect in the regression, I compare the outcomes of siblings who were born before their father took his first trip as a bracero to those who were born after their father took that trip. This methodology will control for any potentially confounding, omitted factors that are constant across the household (i.e., across all individuals in the household).

I include additional controls in the regression to account for other factors that might bias the results. For example, birth year fixed effects to account for cohort effects in educational attainment. Not including these would tend to create a positive bias in the estimates as children born after their father migrated are, by construction, more likely to be born later and those born later are more likely, as a result of education trends in Mexico, to achieve more. Finally, controls that vary across siblings are included, such as sex and birth order.

I estimate an ordinary least squares equation with the elements described above, including household fixed effects, year-of-birth fixed effects, and sibling-variant controls. The regression that is estimated is described below in Equation 1:

$$EdYrs_{i,h,b} = \beta_0 + \beta_1 Unborn_{i,h,b} + X_{i,h,b}^T \alpha + \gamma_h + \mu_b + \varepsilon_{i,h,b} \quad (1)$$



The estimated coefficient,  $\beta_1$ , gives the relationship between being born after a father makes his first migration to the United States as a guest worker under the Bracero Program and the number of years of education eventually attained. If there are no sibling-specific shocks that are correlated with both educational attainment and the timing of migration relative to birth, then this estimated relationship can be interpreted causally.

### ***Preliminary Findings***

The preliminary results from the estimation of Equation 1 are presented in Table 2. The first column is a household fixed effects model with no controls added. Column 2 shows the results from a regression that adds birth year fixed effects to control for cohort effects in educational attainment. Column 3 is the preferred specification that includes both birth year fixed effects and controls for characteristics that vary across siblings (i.e., sex and birth order). Standard errors across all specifications are corrected for heteroscedasticity.

The estimates across all specifications indicate that there is a statistically and economically significant, positive relationship between a father's migration to the United States under the Bracero Program and the educational attainment of those children who are born after his return. Interpreting the estimate in Column 3, I can say that children in a family born after their father went to the United States under the Bracero Program attain 0.406 years more education than those siblings who were born before he left. Comparing this estimate to the mean for the sample, one can conclude that being born after the father's trip increases educational attainment by about 5.8 percent over the average. As long as there are no other sibling-specific shocks correlated with both the timing of migration and educational attainment, the positive relationship between bracero migration and eventual educational attainment can be interpreted as causal. Additional observations from this table of results are consistent with a priori predictions.

Female children in the sample attain fewer years of education. Children at higher birth order attain higher levels of education. The inclusion of birth year fixed effects greatly reduced the estimated coefficient, consistent with a positive bias from that omission in Column 1.

In a second specification, I run a similar regression to the one described in Equation 1, but I include additional age bins instead of just an indicator for unborn in order to look at the effect across different ages of exposure. Results from this estimation are presented in Table 3. The omitted age group is those children who were 18 or older when their father took his first trip under the Bracero Program. Again, the preferred specification is shown in Column 3. Consistent with the first regression discussed previously, there is a significant, positive increase in educational attainment for those born after the father took his first trip. Perhaps more interestingly, the effect is monotonic in the sense that the magnitude is decreasing in the age of exposure for the child (although none of the coefficients on other age groups are statistically significant, probably because of problems of statistical power).

### ***Conclusions, Future Work, and Extension***

The initial analysis in this project indicates that the positive relationship between a father's migration to the United States as a bracero and the human capital attainment of their children is a one that holds in the long run. Children that benefited from the money coming back from the United States end up with more education as adults than those who did not. In order to further explore this relationship and the question described in this paper, I will proceed in two different manners. The first thing I will do is test the plausibility of the causality of the relationship by utilizing a natural experiment in the history of the program. Plausibly exogenous variation in the opening and closing of recruitment centers over space and time will be exploited to confirm the relationship with a different identification strategy and a different dataset. The

second thing I will do is to exploit the model described above (as well as the model exploiting the natural experiment) to explore other long term outcomes for these children. Additional outcomes of interest to be exploited are employment, occupational choice, health, etc. These additional outcomes will tell a more complete story about the positive impacts of this guest worker program on the children of migrants in the long run.

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**Figures and Tables**

Table 1: Summary Statistics

| VARIABLES    | (1)<br>N | (2)<br>mean | (3)<br>sd | (4)<br>min | (5)<br>max |
|--------------|----------|-------------|-----------|------------|------------|
| edys         | 7,027    | 6.990       | 3.895     | 0          | 25         |
| age18andover | 7,027    | 0.00342     | 0.0583    | 0          | 1          |
| age12to17    | 7,027    | 0.0117      | 0.107     | 0          | 1          |
| age6to11     | 7,027    | 0.0363      | 0.187     | 0          | 1          |
| age0to5      | 7,027    | 0.103       | 0.304     | 0          | 1          |
| ageunborn    | 7,027    | 0.846       | 0.361     | 0          | 1          |
| female       | 7,027    | 0.490       | 0.500     | 0          | 1          |

Table 2: The Effect of Father's Migration as a Bracero on Educational Attainment of Children

| VARIABLES                   | (1)<br>edys         | (2)<br>edys         | (3)<br>edys           |
|-----------------------------|---------------------|---------------------|-----------------------|
| ageunborn                   | 1.312***<br>(0.137) | 0.398**<br>(0.160)  | 0.406**<br>(0.159)    |
| female                      |                     |                     | -0.356***<br>(0.0688) |
| order                       |                     |                     | 0.109**<br>(0.0434)   |
| Constant                    | 5.881***<br>(0.116) | 4.865***<br>(0.631) | 3.384***<br>(0.735)   |
| Family Fixed Effects        | Y                   | Y                   | Y                     |
| Year of Birth Fixed Effects | N                   | Y                   | Y                     |
| Observations                | 7,027               | 7,027               | 7,027                 |
| R-squared                   | 0.020               | 0.106               | 0.113                 |
| Number of id                | 1,008               | 1,008               | 1,008                 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3: The Effect of Father's Migration as a Bracero by Age at Exposure

| VARIABLES                   | (1)<br>edysr        | (2)<br>edysr        | (3)<br>edysr          |
|-----------------------------|---------------------|---------------------|-----------------------|
| ageunborn                   | 2.390***<br>(0.312) | 0.891*<br>(0.487)   | 0.854*<br>(0.480)     |
| age0to5                     | 1.213***<br>(0.301) | 0.490<br>(0.423)    | 0.448<br>(0.417)      |
| age6to11                    | 0.529**<br>(0.260)  | 0.222<br>(0.331)    | 0.172<br>(0.330)      |
| female                      |                     |                     | -0.357***<br>(0.0688) |
| order                       |                     |                     | 0.108**<br>(0.0433)   |
| Constant                    | 4.825***<br>(0.299) | 4.372***<br>(0.784) | 2.946***<br>(0.850)   |
| Family Fixed Effects        | Y                   | Y                   | Y                     |
| Year of Birth Fixed Effects | N                   | Y                   | Y                     |
| Observations                | 7,027               | 7,027               | 7,027                 |
| R-squared                   | 0.023               | 0.107               | 0.113                 |
| Number of id                | 1,008               | 1,008               | 1,008                 |

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1