

The Bracero Program and Effects on Human Capital Investments in Mexico, 1942-1964

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Abstract: The Bracero Program was a massive guest worker program that allowed over four million Mexican workers to migrate legally and work temporarily in the United States from 1942 to 1964. This paper examines the development impacts of the program. Exploiting a natural experiment in the institutional history of the program, I use a state's proximity to the nearest recruitment center as an instrument for bracero out-migration. Falsification tests confirm the validity of the identification strategy. I estimate the causal effect of bracero migration on public goods in sending states, such as school enrollments, school provision, and education spending. IV estimates show that OLS estimates are negatively biased and that bracero migration causes increases in school enrollments and in education spending. The Bracero Program increased human capital investments in Mexico, either through positive income shocks or imported ideas that fueled institutional change.

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Preliminary – Not for Citation

1. Introduction

The Bracero Program defined migration policy between the United States and Mexico for over two decades. Lasting from 1942 until 1964, the Bracero Program allowed over four million Mexican agricultural workers to migrate legally, making it the largest guest worker program in the migration history of the United States. In fact, flows of bracero migrants during that time exceeded permanent, legal migrant flows from all countries to the United States many times over. Figure 1 shows the magnitude of bracero flows relative to permanent, legal flows to the U.S. from Mexico and permanent, legal flows to the U.S. from the entire world. This was a guest worker program on a massive scale.

In this paper I analyze the impact of the Bracero Program on economic development and public good provision in Mexico. I examine whether or not bracero migration encouraged investments in education and human capital, both by households and by the state. Specifically, I utilize a new, hand-collected dataset to analyze the causal effect of state-level bracero out-migration on various state-level education outcomes. These outcomes include primary school enrollments, provision of primary schools, and education spending by state governments. Unique institutional features of the program allow for the use of an instrumental variables strategy and the estimation of causal impacts of the program.

For Mexico, the Bracero Program served to alter the trajectory of economic development in those communities that sent braceros. Bracero remittances created positive income shocks for households in those communities that sent them to the United States. Moreover, braceros were exposed to ideas and institutions in the United States, including greater educational opportunities for children than in their own communities in Mexico. Whether or not these forces acted to

improve investments in education and human capital in Mexico is an empirical question that this paper addresses.

Considerable work is done in the sociology and demography literature to better understand the implications of programs like the Bracero Program on migrant populations. Reichert and Massey (1982) argue that, although these programs may provide significant sums of money for migrants to remit home, they do little to increase actual economic development in the sending communities and they are not truly temporary in nature. In fact, they describe how guest worker programs actually perpetuate migration, both legal and illegal, by inducing a reliance on income that can only be earned abroad. Another study uses a unique micro dataset to test these theoretical hypotheses of the inherently “non-temporary” nature of these so-called temporary worker programs (Massey & Liang, 1989). The authors find that braceros were more likely to make repeated trips to the United States, that children of braceros were likely to become migrants, and that a significant portion of braceros eventually settled permanently in the United States. To my knowledge, this is the only study that uses micro data to systematically and empirically understand the individual characteristics of braceros. Finally, Sandos and Cross (1983) suggest that bracero earnings were unlikely to be used in investment given the lack of such opportunities and so were more likely used in a household’s consumption. It remains to show whether or not the positive income shocks from remittances did actually increase human capital investments.

Gibson and McKenzie (2010) present evidence that temporary worker programs can have significant, positive development impacts. They show that a recent program that brings Pacific Islanders to work temporarily in New Zealand has positive effects on income, consumption, durable goods consumption and subjective standards of living. What remains to be shown is if

this type of program can improve investments in human capital, and whether the positive impacts are generalizable to the unique relationship between the United States and Mexico.

There exist studies that specifically investigate the link between human capital investment and migration from Mexico. Hildebrandt and McKenzie (2005) and McKenzie and Rapoport (2011) study the impact of current migration on human capital investment in children, examining health outcomes and educational attainment, respectively. Both papers use the same household survey data from Mexico, and both utilize an instrumental variables strategy that uses historic migration rates as an instrument for current migration rates in order to circumvent the selection biases inherent in all of these analyses.¹ Using these similar empirical methodologies, Hildebrandt and McKenzie find that migration seems to cause an increase in positive health outcomes for children such as higher birth weights and lower infant mortality, yet McKenzie and Rapoport find that migration reduces educational attainment for both boys and girls. On the other hand, a study by Hanson and Woodruff (2003) finds that children in Mexico that come from households with external migrants in the U.S. tend to complete more years of schooling. They conclude that remittances from migration must relax the household income constraint to allow for greater educational attainment. Thus, in terms of human capital investment, it is not immediately obvious whether migration from Mexico has a positive or negative impact on populations in the sending communities.

In addition to remittances, many thought that the Bracero Program could have negative effects for children and family life. Rosas (2011) finds that the program led to the separation of children and caretakers, thereby negatively impacting the psychological and physical well-being of the family and the children. This disruption could lead to negative impacts for the education

¹ For further information regarding the use of historic migration rates as an instrument for current migration rates, see Woodruff and Zenteno (2007).

of the children of braceros. On the other hand, it could be that female heads of household are more likely to invest in their children and so the absence of fathers will increase the educational opportunities for children. Again, the effect of the Bracero Program on household decisions related to education is not clear.

Utilizing a novel instrumental variables strategy, I estimate the causal impact of the Bracero Program on human capital investments to be significant and positive. I use the proximity of a state in a particular year to the nearest bracero recruitment center as an instrument for the number of braceros migrating from that state. My results indicate that the program indeed increased investments by households in education as states that sent more braceros to the United States also experienced higher levels of primary school enrollments. Likewise, the program also induced greater human capital investments by the state governments. Sending more braceros to the United States caused increases in the state governments' expenditures on education.

Identifying the direct benefits of bracero migration, both through household decisions and through decisions by the state to increase the provision of public goods, is important to development policy. If temporary worker programs can be shown to be a valuable tool, they can be used to improve the conditions of developing areas of the world. In the economic history literature, much has recently been written about historical migration (Abramitzky, Boustan & Eriksson, 2010; Armstrong & Lewis, 2009; Ferrie, 1994 & 1997; Greenwood, 2007 & 2008). In the development literature, much has been written about the impacts of migration on sending communities, especially for present day Mexico (Hildebrandt & McKenzie, 2005; McKenzie & Rapoport, 2011; Yang, 2008). We know little to nothing, however, about either the impacts of a temporary worker program or of early twentieth century Mexican migration. The work

presented here will both increase our understanding of a more complete history of migration and provide a basis for the evaluation of the future use of guest worker programs.

2. *Historical Context*

2.1 *The Bracero Program*

As the United States found herself heavily involved in World War II, farmers called on the United States government to take action. The war both greatly reduced the labor supply and increased demand for agricultural products. The farmers perceived a labor shortage and lobbied the government to allow the importation of migrant labor from Mexico for relief. Mexico decided to take an active role in the process and the resulting immigration program was a bilateral effort by both the United States and Mexico.²

The first major agreement was reached on July 23, 1942 by representatives of both the United States and Mexican governments, and put into effect by an exchange of diplomatic notes on August 4, 1942 (EAS 278, p.1069). This agreement established a number of terms and conditions under which the program was to operate and continued in force until December 31, 1947.³ After negotiations between delegates from both countries, a temporary agreement was reached on February 17, 1948 and signed into force by an exchange of diplomatic notes on February 21, 1948 that allowed for the continuation of the program. This agreement, however, was terminated by the Mexican government, pursuant to notice given on October 18, 1948 (TIAS 1968, p.1232). After further negotiation, a new agreement was established on July 29, 1949 and

² I refer to the collection of agreements between the United States and Mexico for the period 1942 to 1964 as the Bracero Program. In 1917, responding to similar shortages caused by the United States entering WWI, some provision was made for the contracting of labor from Mexico. Specifically, a proviso was placed in the immigration legislation of 1917 (which prohibited entry by immigrants contracted for labor) that allowed the Commissioner General of Immigration to bypass the requirements for entry and permit temporary migration by laborers from Mexico if conditions in the labor market should so require it. This earlier episode is sometimes referred to as the “First Bracero Program,” (Scruggs, 1960).

³ The agreement was relatively unchanged over this period, although there was a revision entered into force by an exchange of diplomatic notes on April 26, 1943 (EAS 351, p.1129)

entered into force by an exchange of diplomatic notes on August 1, 1949, which continued until it was terminated by Mexico on June 15, 1951 (TIAS 2260, p.1258). After the passage of Public Law 78 by Congress on July 12, 1951 which institutionalized the Bracero Program, transferred control to the Secretary of Labor, and provided the legislative foundation for the United States to keep negotiating bilateral labor agreements with Mexico, talks between Mexico and the United States continued (Craig, 1971). On August 11, 1951, a new agreement was entered into force by an exchange of diplomatic notes (TIAS 2331, p.1940). Despite several amendments, this agreement remained in force until December 31, 1964, a date agreed upon for termination by an exchange of diplomatic notes (TIAS 5492, p.1804).

From the Mexican point of view, the Bracero Program was controversial. Many interest groups in Mexico viewed the temporary worker program as particularly attractive. In terms of economic development, the program promised the easing of rural unemployment, the accumulation of substantial savings for poorer households from earnings abroad, and the import of agricultural skills and technology from the United States (Craig, 1971). Moreover, this was an opportunity for Mexico to ingratiate herself politically to the United States, with the beginnings of the Bracero Program serving as her part in the war effort. Lastly, from a balance of payments perspective, this program was the opportunity for the influx of American dollars from bracero remittances (Craig, 1971). On the other hand, opposition came from groups concerned that labor shortages resulting from sending agricultural labor abroad would stunt Mexico's own agricultural development. As Ezequiel Padilla, Minister of Foreign Affairs in Mexico, pointed out to American Ambassador, George Messersmith:

“This Department considers itself under the obligation, first of all, of pointing out the importance for the country at present moment of conserving intact its human material, indispensable for the development of the program of continental defense to which the Government of Mexico is jointly obligated and in which, by very urgent recommendation

of the Head of the Executive Power, the intensification of activities and especially agricultural production take first rank,” (EAS 278, p.1069).

Not only that, but other groups worried that such a program would disrupt family life, expose the migrant to an immoral life and to Protestantism, engender greater economic dependence on the United States for the Mexican government, expose the migrant to politically radical ideas, and subject the Mexican citizen to racial discrimination and the humiliation of performing menial tasks (Craig, 1971). Thus, even before the program began, it was not obvious whether it would affect the country in a positive or negative way.

Although the rules governing the migration of braceros from Mexico to the United States changed slightly as the agreements were renegotiated, the general process to migrate remained relatively stable. First, growers or grower associations in the United States would certify with the United States government that a labor shortage existed and would provide the prevailing wage for the specific type of work in the region. Upon agreement by the appropriate agency in the United States government, an order would be sent to the Mexican authorities requesting a specific number of braceros for the work.

In Mexico, braceros arrived at the recruitment centers through one of two ways. Some were the recipients of permits or *permisos*, distributed to local mayors to hand out to individuals in their communities, who came to the recruitment centers with their permit promising a contract in hand. Others, known as *libres*, traveled to the recruitment centers without permits to wait in line with the hopes of being selected to receive a contract. Once selected to receive a contract, the bracero was transported from the Mexican center to a reception center in the United States and then to the place of employment, all at the expense of the employer. After performing the job for the time period for which they were contracted at the specified wage (including several

other benefits such as insurance, guaranteed work, food and housing, etc.), the worker was transported back to the recruitment center in Mexico at the expense of the employer.

2.2 *Education in Mexico*

In the post-revolutionary period, Mexico took several steps to socialize and centralize the provision of basic education. Article 3 of the new Constitution of 1917 guaranteed that education be free and nonreligious.⁴ The *Secretaria de la Educacion Publica (SEP)* was created in 1921 to oversee all matters relating to education. The federal government was in charge of the training of new teachers, setting the curriculum, and providing the majority of the resources for the expansion of education in the country (Andrade de Herrera, 1996). The Constitution also provided that primary schooling, in addition to being free and nonreligious, was compulsory and mandatory (Santibanez, Vernez & Razquin, 2005). It is important to note, however, that mandatory referred to the fact that the government had to provide the primary education free of charge, not that parents had to send their children (Helper, Levine & Woodruff, 2006). Despite the fact that much of Mexico's education policy during the mid-twentieth century was highly centralized, states and municipalities did collect revenues to spend on education. Furthermore, the transfers from the federal government to the state governments were dependent on the amount of tax revenues collected in the state (Rodriguez, 1997; Helper et al., 2006).

3. *Data*

3.1 *Data Sources and the Construction of the Sample*

Firstly, I trace institutional changes in the Bracero Program over time, utilizing the international agreements that were signed between officials of the United States and Mexico as primary source materials. The locations for the bracero recruitment centers in Mexico are stipulated in these

⁴ The article was amended in 1933 to read that education was to be socialist. The article was further amended in 1946 under President Camacho to remove references to a socialist education.

agreements. I use these agreements to identify the locations of the various recruitment centers in Mexico for each year of the program. Until the agreement of August 1, 1949, the locations of the recruitment centers were not included in the agreements and so I use secondary source materials to identify the placement of the centers prior to this date (Galarza, 1964).⁵ Table 1 lists these locations and Figures 2-10 show the locations of these centers and how they change over time.

Using these locations, I create a measure of adjacency or proximity to the recruitment center for each state in Mexico at each point in time. A dummy variable is created that takes a value of one if the state has a recruitment center in it and a value zero otherwise. Likewise, a dummy variable is created that takes a value of one if the neighboring state has a recruitment center in it and a value zero otherwise. In a similar fashion, I create dummy variables for having a recruitment center one state away, two states away, or more than two states away. These data are used to construct an instrument for an IV strategy that I will describe further in the next section.

Secondly, I collect state-level characteristics from the *Anuarios Estadísticos de los Estados Unidos Mexicanos* from the years 1942-1967. These statistical yearbooks of administrative data were compiled and made available by the national statistical agency in Mexico, the *Instituto Nacional de Estadística y Geografía (INEGI)*. The data include the numbers of braceros leaving each state, primary school enrollments for each state, the number of primary schools in each state, and state government spending on education.⁶ This data collection

⁵ The agreement entered into force on February 21, 1948 actually references the placement of the recruitment centers, but only stipulates that they should be no farther south than a particular location in Mexico (TIAS 1968, p. 1235)

⁶ For the years 1942 through 1954, the statistical yearbooks provide the number of braceros leaving a state. For the years 1958 through 1964, the statistical yearbooks change the name to agricultural migrants. The statistical yearbooks provide no data on braceros for the years 1955 through 1957. These

process yields a dataset of state-year observations of 31 states and one federal district over the 23 year period, from 1942 to 1964, for which the program was in effect.

3.2 Describing the Sample

I summarize the sample in Table 2. As I described previously, data are missing for some states in certain years, and so the sample size varies for each variable. On average, 5,199 braceros leave a given state in a given year, although there is quite a bit of variation across the sample. Urban primary school enrollments are greater than rural enrollments. The average state has 71,777 students enrolled in urban primary schools and 52,543 students enrolled in rural primary schools for an average year. There is greater dispersion in urban enrollments than in rural enrollments.⁷ The average state has 858 primary schools in a given year. Finally, state governments spend, on average, 10.1 million pesos a year on education. Again, there is significant variation in both the number of schools and education spending across states and across time.

4. Identification

As I show in Table 2, the number of braceros that leave each state in Mexico varies over the 23 year lifespan of the Bracero Program. I utilize this variation across states and over time to identify the impact of bracero out-migration on the economic outcomes of interest. The biggest challenge in identifying the causal effect of the Bracero Program on any number of outcomes is the selection of states into participation. For instance, if those states that experience the worst economic conditions are more likely to send braceros to the United States, and if these poor

data were all provided to INEGI from the Mexican Department of the Interior. Primary school enrollments are detailed in the statistical yearbooks for all years except 1961. The number of primary schools is given for all years (a distinction between rural and urban primary schools is made for all years through 1961). The amount spent by state governments on education is given for all years except 1963.

⁷ The minimum for rural schools is zero because some states (i.e., Mexico D.F.) had no schools classified as rural in some years.

economic conditions are likely to be negatively correlated with economic outcomes of interest, then ordinary least squares estimates of the impact of the program will be negatively biased.

I employ state and year fixed effects in an effort to overcome this bias. Year fixed effects will control for any potentially confounding factors that affect all Mexican states the same in a particular year. State fixed effects will control for any potentially confounding factors that are time invariant, or that remain constant for a particular Mexican state over the entire sample period. The fixed effects model is given by Equation 1.

$$\log(\text{Outcome})_{s,T} = \beta_0 + \beta_1 \log(\text{Braceros})_{s,T} + \delta_s + \mu_T + \epsilon_i \quad (1)$$

It is highly likely, however, that an omitted variable bias remains from time-varying factors that are specific to a given state. If, for example, high unemployment in a given state in a given year is positively correlated with bracero out-migration and negatively correlated with outcomes such as primary school enrollment, then I would expect the fixed effects model to produce biased estimates. As noted previously, if states send more braceros in years when they experience poorer economic conditions (factors that are likely correlated with lower investments in human capital), I would expect the OLS estimates to be negatively biased.

In order to produce causal estimates of the impact of the Bracero Program on educational outcomes in Mexico, I utilize a natural experiment in the institutional features of the program to extract exogenous variation in the out-migration of braceros from a particular state in a given year. Specifically, I use the proximity of a given state to the nearest bracero recruitment center in Mexico in a given year as an instrument for the number of braceros that leave that state in that particular year.

The instrumental variables approach relies on the validity of two key assumptions. Firstly, it is necessary that the correlation between the instrument and the endogenous variable is

sufficiently strong. I provide evidence of a strong first stage relationship between the number of braceros that leave a particular state in a particular year and the proximity of that state to the nearest recruitment center in that year. Secondly, it must be that the instrument is uncorrelated with the error term in Equation 1. This exclusion restriction requires both the instrument to be as good as randomly assigned in the reduced form relationship and the instrument to affect the outcome only through the endogenous regressor. I provide evidence for the validity of the exclusion restriction as well.

4.1 Bracero Out-Migration and Proximity to the Nearest Recruitment Center

In order to migrate as a bracero to the United States, a laborer in Mexico had to first travel to a bracero recruitment center in Mexico. A person could meet with a recruiter in his local community and pay to initiate the process to become a bracero. He would then need to travel to the recruitment center at his own expense to complete the process and wait in line to be called for service. Alternatively, he could bypass the recruiter and travel directly to the recruitment center at his own expense to try and become a bracero there. Either way, he had to cover the costs of transportation to get himself from his home to the bracero recruitment center in Mexico (Galarza, 1964; Anderson, 1976).

Travel within Mexico at this time was not easy, especially from rural locations. Some prospective braceros walked while others incurred the expense of transportation by bus or other means (Anderson, 1976). Those who were closer in distance to the bracero recruitment center found it less costly to get there, and so were more likely to get to the center and hence more likely to be contracted to work as a bracero in the United States. Thus, distance to the nearest recruitment center is a real determinant of the number of braceros who leave for the United States.

Figure 11 gives the average of the logged number of braceros leaving a state (after controlling for state and year fixed effects) for each category used to define proximity to the nearest recruitment center (i.e., recruitment center in a state, recruitment center in a neighboring state, etc.). I also include the 95% confidence interval around the mean for each bin. The figure shows a definite negative relationship between the number of braceros that leave a state and the distance to the nearest recruitment center. Those states that are closest to the recruitment center send the most braceros, and the number of braceros leaving declines as the state is located farther away from the center.

I test the first stage relationship between the proximity of a given state in a given year to the nearest recruitment center and the number of braceros that leave that state in that year for the United States using Equation 2.

$$\begin{aligned} \log(\textit{Braceros})_{S,T} &= \alpha_0 + \alpha_1 \textit{InState}_{S,T} + \alpha_2 \textit{Adjacent}_{S,T} + \alpha_3 \textit{OneAway}_{S,T} \quad (2) \\ &+ \alpha_4 \textit{TwoAway}_{S,T} + \delta_S + \mu_T + u_{S,T} \end{aligned}$$

This is a regression of the log of the number of braceros who leave a given state in a given year on a vector of dummy variables to describe the proximity of the state to the nearest bracero recruitment center in that year (i.e., whether the nearest center was in the states, in a neighboring state, one state away, two states away, or more than two states away), state fixed effects, and year fixed effects. Table 3 shows the results of this estimation.

These results confirm the pattern in Figure 11. Those states closest to the recruitment center send the most braceros, with all estimates being highly, statistically significant. Furthermore, this relationship is monotonic; states that have recruitment centers in them send the most braceros, states with recruitment centers in adjacent states send fewer than those with

centers in them and more than all other states, and so on. Finally, a test of the joint hypothesis that all coefficients on the set of instruments are equal to zero is rejected with an F statistic equal to 19. This is large enough to be sure that weak instruments will not cause inconsistency in the IV estimates (Bound, Jaeger & Baker, 1995). Thus, the analysis confirms that there is a strong first stage relationship between the number of braceros that leave a particular state in a given year and the proximity of that state to the nearest recruitment center.

4.2 The Exclusion Restriction

The second assumption that the instrumental variables strategy requires is that the proximity of a state to the nearest recruitment center in a given year is not correlated with the error term in Equation 1. This exclusion restriction likely holds, given the unique institutional features of the Bracero Program.

What is known as the Bracero Program was actually a series of international agreements that were negotiated between the two nations over the years from 1942 to 1964. Over the 23 year lifespan of the program, the location of the recruitment centers changed. These changes resulted from negotiations between officials from the Mexican and United States governments. Each time these agreements were either extended or re-negotiated, each side worked hard to include changes that would benefit their own national goals. The international agreements that were signed actually specified the places where recruitment centers were to be located. Thus, the location of the recruitment centers changed over time, and these changes were the result of bilateral negotiations between the United States and Mexico, not state-level economic conditions.

Mexico wished to keep the recruitment centers located as far south as possible. Firstly, the great farms of Mexico that fueled much of her agriculture were located in the North.

Locating the recruitment centers farther south would help to prevent the Bracero Program from draining the precious supply of agricultural labor in the North that was needed to keep these farms functioning properly (Galarza, 1964; Delano, 2011; Durand, 2007). The possibility that the Bracero Program would steal much needed labor from Mexico was a real concern of Mexican officials. Mexico could not let the United States' demand for braceros compete with her own demand for agricultural labor, thereby reducing her own agricultural productivity. She had an incentive to keep recruitment centers far away from agribusiness in the North.

Secondly, Mexico was very concerned about the problem of illegal migration to the United States. Recruitment centers located in northern parts of Mexico could lead to illegal migration for those rejected braceros who had already made the expensive trip to the center. It would be very easy for these individuals to cross the border and work illegally in the United States if they could not get a bracero contract (Galarza, 1964). Thus, to try and prevent illegal migration to the United States, Mexico had an incentive to keep the recruitment centers as far south as possible.

The United States, on the other hand, wished to locate the recruitment centers in Mexico as far north as possible. By international agreement, the employer in the United States was required to pay all transport and travel costs of the bracero from the recruitment center in Mexico to the place of employment and back at the end of the contract period (Anderson, 1976).⁸ This was explicitly stated in the Individual Work Contract which said:

“Transportation of the Worker, including transportation from the contracting center to the place of employment and return to the place of contracting, as well as food, lodging and other necessary expenses en route, including up to 35 kilograms of personal articles, but not including furniture, shall be at the expense of the Employer,” (TIAS 2260, p.1063)

⁸ In the initial phases of the program (1942-1947) these expenses were paid by the U.S. government. Later, they were covered by employers in the U.S. who paid into a revolving fund with the Department of Labor (Anderson, 1976).

In order to minimize costs for U.S. interests, the United States government had an incentive to locate the recruitment centers in Mexico as far north (i.e., as close to the U.S. border) as possible (Galarza, 1964; Durand, 2007).

The actual locations of these recruitment centers were borne of negotiations between the two sides. Both Mexico and the United States had distinct incentive to locate the recruitment centers in specific parts of Mexico; as far south as possible for the former and as far north as possible for the latter. Thus, the decision to open and close centers over time can be described as a story of bargaining power at the international level (Delano, 2011).⁹ The unique spatial and temporal pattern to the location of these centers that results is plausibly exogenous to the local, state-level conditions in Mexico that affected educational outcomes. Although an untestable assumption, the exclusion restriction is likely to hold as a result of this unique, institutional feature of the Bracero Program.

4.3 *Eliminating Potential Threats to Identification*

In further consideration of the validity of the planned identification strategy, it is important to distinguish between those factors that are not threats and those that are. Any characteristics of a state in Mexico that do not change over time will not threaten identification. The state fixed effects will eliminate any bias from these omitted variables. For example, proximity of a state to the border, proximity of a state to the capital, and relative size of the state (assuming no large population shifts in the 23 year period) are all factors that could threaten identification, but that are of no concern because of the inclusion of state fixed effects. Any national trends in Mexico

⁹ For example, at the beginning of the program, Mexico was able to exercise greater bargaining power and have centers located farther south in the country since the U.S. was desperate for the labor. In renegotiations right after the war, the U.S. was no longer desperate, but Mexico was eager to have a bilateral policy in place. As a result, centers opened in northern cities. With the outbreak of the Korean War, Mexico once again regained the advantage in negotiations and exercised its power to open centers in places that they would like. After the end of the Korean War the U.S. once again gained the advantage in negotiations and centers opened closer to the border (Delano, 2011).

that change over time, but that affect all states the same, will not threaten identification. The year fixed effects will eliminate any bias from these omitted variables. For instance, any national political, economic, or institutional factors that could threaten identification are not of concern (so long as they affect all states equally) because of the inclusion of year fixed effects. Thus, the only factors that remain a potential threat to identification are those that vary over both space and time, and that cause a violation of the exclusion restriction.

One such factor is the extent of political control exercised by the PRI, the dominant political party at this time in Mexico. The PRI won national elections in all states in Mexico in each of the presidential elections during the time of the Bracero Program, and so the fact that a state voted to elect a PRI candidate to the presidency is not a potentially confounding factor since that does not vary across space or across time. However, the strength of the PRI in a particular state in a given year could vary and threaten identification. Specifically, if the PRI decided to funnel resources to areas where they were in danger of losing an election in hopes of gaining the support of the populace, then the placement of recruitment centers might not be exogenous to this political factor. In order to eliminate this potential threat, I perform a falsification test. Mario Ramirez Rancano (1977) tabulates the results of presidential elections in Mexico. I use the number of PRI votes and non-PRI votes in each state in the elections of 1940, 1946, 1952, and 1958 and construct a state-level variable that measures the margin of a PRI win in the previous presidential election (i.e., the number of PRI votes less the number of non-PRI votes or the number of votes by which the PRI won). I estimate Equation 2, but replace the dependent variable with the log of the PRI vote margin in the previous election. The results of the estimation are presented in Table 4. None of the individual coefficients on the proximity variables are statistically significant, and an F test for the joint significance of the group of

proximity variables yields a highly insignificant F statistic of 0.53. All in all, this shows that political maneuvering by the PRI does not appear to be correlated with the placement of recruitment centers and so does not pose a threat to the identification strategy.

5. *Estimation and Results*

5.1 The Effect of Bracero Migration on Household Investments

I examine the impact of bracero program participation on human capital investments by households in a state. The household decision that I examine is a most fundamental one – whether or not to enroll a child in school.

I estimate the model given by Equation 1 using ordinary least squares, regressing the log of primary school enrollments on the log of bracero out migration and state and year fixed effects. The results of the estimation are given in Table 5. For urban primary schools, a 10% increase in the number of braceros that leave a state is associated with a 0.07% increase in the number of students enrolled in urban primary schools, although this is not statistically significant. A 10% increase in the number of braceros that leave a state is associated with a 0.1% increase in the number of students enrolled in rural primary schools, a result that is statistically significant at the 5% level. Combining rural and urban enrollments, I show that a 10% increase in the number of braceros that leave a state is associated with a 0.07% increase in the number of students enrolled in primary school, although this is statistically insignificant. These OLS models suggest a positive relationship between bracero migration and primary school enrollments.

I estimate the model using the instrumental variables strategy to obtain causal estimates of the impact of the migration of braceros on primary school enrollments. A two stage least squares process is applied to the model in Equation 1. The results of the IV estimation are given

in Table 6. All of the IV estimates are larger than the corresponding OLS estimates, consistent with the likely negative bias in the OLS estimation. A 10% increase in the number of braceros that leave a state in a given year causes a 0.3%, 0.4%, and 0.3% increase in the number of children enrolled in urban primary schools, rural primary schools, and all primary schools, respectively. It is important to note that the effect is still greatest for rural primary enrollments. This is quite intuitive given that most braceros came from rural areas and the impact of their migration would be concentrated in those areas from which they came. These estimates are statistically significant at the 10% level for urban and rural primary enrollments and at the 5% level for all primary enrollments. This effect is also economically significant. Consider an average state in an average year with 5,199 braceros leaving, 71,777 enrolled in urban primary schools, 52,543 enrolled in rural primary schools, and 124,319 enrolled in primary schools. The estimated effect of 0.3% would imply that increasing the number of braceros that leave the state by about 520 braceros would increase urban primary school enrollments by about 215 students, rural primary school enrollments by about 158 students, and total primary enrollments by 373 students.

5.2 *The Effect of Bracero Migration on Investments by the State*

I examine the impact of bracero migration on human capital investments by a state and the provision of public goods for the citizenry. The first decision by a state that I analyze is the decision to provide schools. The second decision that I analyze is the decision to invest in education in terms of state government expenditures for education.

I estimate the model given by Equation 1 using ordinary least squares, although I lag the outcome variables to account for some level of inflexibility in government action. Specifically, any reaction to bracero migration, either as a result of increased tax revenues or political demand

by returning braceros, are not likely to occur in the same year in which migration takes place since state budgets are already set. The earliest any effect should be felt is one year later.¹⁰ I regress the log of both the number of schools and state education expenditures in the next year on the log of the number of braceros leaving the state in the current year, as well as state and year fixed effects. The results of this estimation are given in Table 5. The results are mixed, with an increase in the number of braceros leaving a state associated with a 0.08% decrease in the number of primary schools and a 0.1% increase in the number of pesos spent on education by the state government. The estimate of the effect on education spending is not statistically significant. OLS estimation provides no evidence that bracero migration is related to positive investments by the State in human capital.

I estimate the model in Equation 1 using the instrumental variables strategy and two stage least squares to obtain causal estimates of the effect of bracero migration on both the provision of schools and education spending by the state government. The results of the IV estimation are given in Table 6. All of the IV estimates are larger than the corresponding OLS estimates, consistent with the likely negative bias in the OLS estimation. These results suggest that a 10% increase in the number of braceros that leave a state in given year causes a 0.06% decrease in the number of primary schools in the state in the next year, but a 1.4% increase in the number of pesos spent on education by the state government in the next year. The point estimate for primary schools, although negative is not statistically different from zero.¹¹ The effect on state education spending, however, is highly statistically significant. To put the effect in perspective,

¹⁰ This is a timing issue that I will continue to explore further. It is possible that effects might not be felt until the year following the next election. I plan to continue experimenting with different lag structures to better capture the actual decision-making process by state governments.

¹¹ I am currently exploring alternate measures of school provision available in the statistical yearbooks. It might also be that the construction of new schools is a centralized decision by the federal government that would not respond as much to local political pressure.

consider an average state in an average year with 5,199 braceros leaving and 10.1 million pesos spent on education. This effect implies that, for the average in the sample, an increase in the number of braceros that leave a state by 520 individuals causes an increase in the amount spent on education in the next year by the state government of 141,400 pesos.

6. *Concluding Remarks*

The Bracero Program was a massive guest worker program that allowed over four million Mexican workers to migrate and work temporarily in the United States from 1942 to 1964. Wages were specified by contract, along with other worker benefits. These wages were relatively higher than what could be earned in the home communities, and so remittances from braceros created positive, albeit temporary, income shocks to their households. Moreover, their time in the United States exposed braceros to ideals and institutions, including those of educational opportunity for children. Whether or not these forces were enough to cause households and the state to make significant human capital investments is a topic relevant to both the history of economic development in Mexico and to the possible use of guest worker programs as development policy today.

Results from the IV estimation indicate that the program did induce households to make greater human capital investments in their children as more bracero out-migration from a state caused increases in primary school enrollments in that state. The effect of the Bracero Program on investments by the state is less clear as IV estimates indicate no significant effect on the provision of primary schools, but a significant and positive effect on education expenditures by the state governments. These results have important implications for long run economic growth in Mexico. By causing higher investments in human capital in the mid-twentieth century, it could increase opportunities and standards of living for many years to come. Identifying the

Bracero Program as a policy that set regions on a path of long run economic prosperity is an important step to promoting guest worker programs as the ultimate aid policy with benefits to all agents involved.

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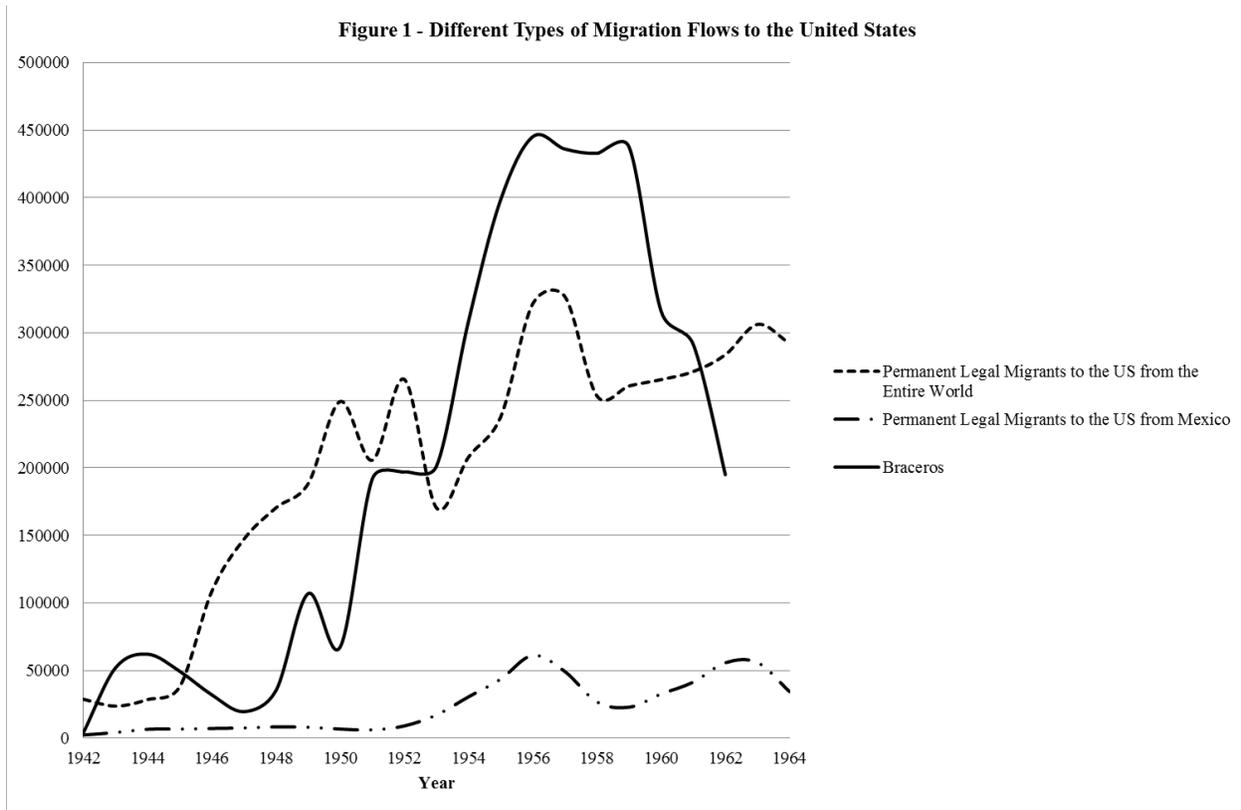
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Figures and Tables

Figure 1 - Different Types of Migration Flows to the United States



Various Sources, Available Upon Request

Figure 2 – Recruitment Centers, 1942-1943



Figure 3 – Recruitment Centers, 1944-1946



Figure 4 – Recruitment Centers, 1947-1949

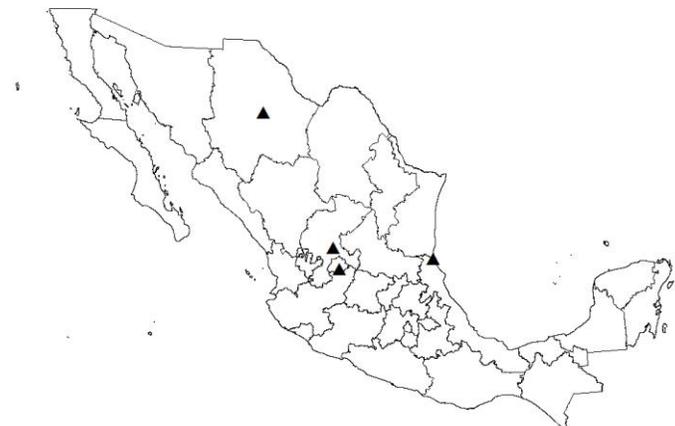


Figure 5 – Recruitment Centers, 1950-1951



Figure 6 – Recruitment Centers, 1952



Figure 7 – Recruitment Centers, 1953-1954

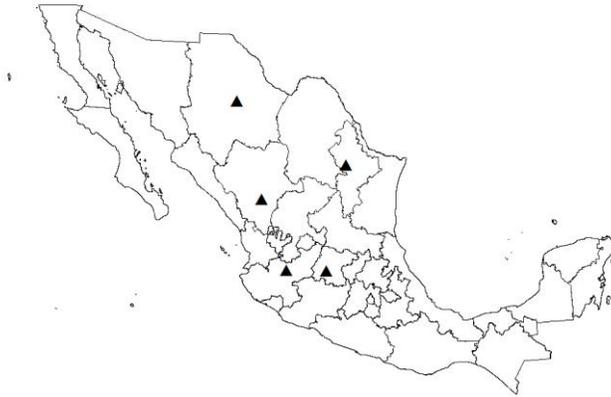


Figure 8 – Recruitment Centers, 1955



Figure 9 – Recruitment Centers, 1956-1962

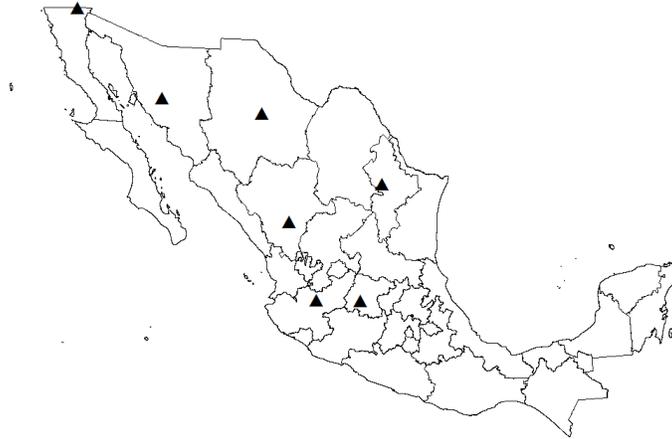
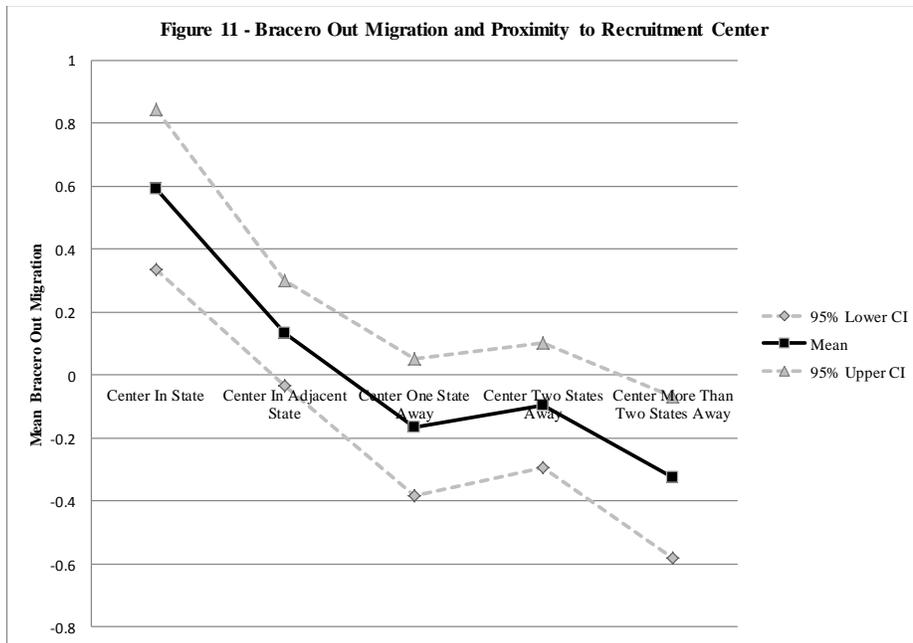


Figure 10 – Recruitment Centers, 1963-1964



Sources for Recruitment Center Maps: INEGI GIS files; City map coordinates found using Wikipedia.org and GeoHack; Recruitment Center locations from international agreements TIAS 1968, TIAS 2260, TIAS 2328, TIAS 2331, TIAS 2586, TIAS 2932, TIAS 3242, and TIAS 5160; Recruitment Center locations taken from Galarza (1964)



Notes: State and year effects have been removed from these bracero figures.
 Source: Anuarios Estadísticos de los Estados Unidos Mexicanos 1942-1967, International Agreements signed between officials of the United States and Mexico, and secondary source materials.

Table 1 – Mexican Recruitment Centers over Time	
<i>Date</i>	<i>Recruitment Centers</i>
1942	Mexico City
1944	Guadalajara, Jalisco Irapuato, Guanajuato
1947	Zacatecas, Zacatecas Chihuahua, Chihuahua Tampico, Tamaulipas Aguascalientes, Aguascalientes
1 August 1949	Hermosillo, Sonora Chihuahua, Chihuahua Monterrey, Nuevo Leon
11 August 1951	Aguascalientes, Aguascalientes Guadalajara, Jalisco Irapuato, Guanajuato Monterrey, Nuevo Leon Chihuahua, Chihuahua
19 May 1952	Monterrey, Nuevo Leon Chihuahua, Chihuahua Irapuato, Guanajuato Guadalajara, Jalisco Durango, Durango
10 March 1954	Mexicali, Baja California Monterrey, Nuevo Leon Chihuahua, Chihuahua Irapuato, Guanajuato Guadalajara, Jalisco Durango, Durango
14 April 1955	Hermosillo, Sonora Mexicali, Baja California Monterrey, Nuevo Leon Chihuahua, Chihuahua Irapuato, Guanajuato Guadalajara, Jalisco Durango, Durango
1 February 1962	Monterrey, Nuevo Leon Chihuahua, Chihuahua Empalme, Sonora

Source: Recruitment Center locations from international agreements TLAS 1968, TLAS 2260, TLAS 2328, TLAS 2331, TLAS 2586, TLAS 2932, TLAS 3242, and TLAS 5160; Recruitment Center locations taken from Galarza (1964)

Table 2 - Sample Summary Statistics

Variable	N	Mean	Standard Deviation	Min	Max
Braceros	633	5,199	9,893	0	61,381
Primary School Enrollment, Urban	736	71,777	115,805	970	1,182,224
Primary School Enrollment, Rural	736	52,543	43,139	0	274,128
Primary School Enrollment	736	124,319	131,895	2,144	1,182,224
Primary Schools	768	858	648	33	4,612
Education Spending by State Governments	693	10,100,000	16,300,000	0	118,000,000

Source: Anuarios Estadísticos de los Estados Unidos Mexicanos 1942-1967.

Table 3 - First Stage Relationship

VARIABLES	(1) log (Braceros)
Center In State	2.261*** (0.275)
Center In Adjacent State	1.483*** (0.235)
Center One State Away	0.796*** (0.243)
Center Two States Away	0.608*** (0.232)
Constant	2.914*** (0.300)
State Fixed Effects	Yes
Year Fixed Effects	Yes
F Statistic for Excluded Instruments	19
Observations	620
R-squared	0.828

Notes: All regressions include State and Year fixed effects; Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4 - Falsification Test

VARIABLES	(1) log (Vote Difference)
Center In State	-0.0627 (0.0805)
Center In Adjacent State	-0.0370 (0.0826)
Center One State Away	-0.0901 (0.0860)
Center Two States Away	-0.0889 (0.107)
Constant	9.641*** (0.0766)
State Fixed Effects	Yes
Year Fixed Effects	Yes
F Statistic for Joint Significance	0.53
Observations	731
R-squared	0.912

*Notes: All regressions include State and Year fixed effects; Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table 5 - OLS Regressions

VARIABLES	(1) log (Urban Enrolled)	(2) log (Rural Enrolled)	(3) log (Enrolled)	(4) log (Schools)_t+1	(5) log (Spending)_t+1
log (Braceros)	0.00711 (0.00502)	0.0137** (0.00610)	0.00654 (0.00408)	-0.00861** (0.00348)	0.0175 (0.0135)
Constant	8.946*** (0.0743)	8.830*** (0.0519)	9.612*** (0.0484)	5.067*** (0.0329)	11.44*** (0.170)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	589	580	589	620	558
R-squared	0.981	0.939	0.986	0.984	0.917

*Notes: All regressions include State and Year fixed effects; Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table 6 - IV Regressions

VARIABLES	(1) log (Urban Enrolled)	(2) log (Rural Enrolled)	(3) log (Enrolled)	(1) log (Schools)_t+1	(2) log (Spending)_t+1
log (Braceros)	0.0335* (0.0186)	0.0356* (0.0201)	0.0335** (0.0156)	-0.00644 (0.0118)	0.135*** (0.0409)
Constant	8.850*** (0.115)	8.754*** (0.0893)	9.514*** (0.0818)	5.059*** (0.0515)	11.02*** (0.228)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
First Stage F Stat	19.87	15.84	19.87	19	13.98
Observations	589	580	589	620	558
R-squared	0.980	0.938	0.984	0.984	0.909

*Notes: All regressions include State and Year fixed effects; Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*