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The Bracero Program and Effects on Human Capital Investments in Mexico, 1942 to 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. I estimate the causal effect of bracero migration on human capital investments 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 caused increases in primary school enrollments and in education spending. Analysis of heterogeneous effects suggests that the effect occurred at the marginal years of education (i.e., latter parts of primary schooling and early secondary schooling) and that the effect was relatively larger for female children than for male children. The Bracero Program increased human capital investments in Mexico through positive income shocks, a change to household structure, imported ideas that fueled institutional change or some combination thereof.

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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, including primary school enrollments, post-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 the sending communities. Temporary, positive income shocks from income earned abroad can increase household investments, especially in credit-constrained environments (Yang, 2008). Income earned through migration can ease a liquidity constraint, allowing parents to cover high fixed costs of education and substitute away from child labor toward the education

of children (Baland and Robinson, 2000). Empirical studies have found that migration and remitted income have caused increases in childhood health (Hildebrandt and McKenzie, 2005) and educational outcomes for children (Hanson and Woodruff, 2003; Antman, 2012), at least in the modern context. Higher earning potential abroad, however, could also have a detrimental impact on human capital investments. If the higher earnings abroad as agricultural labor lowered the return to Mexican education by offering a lucrative career path that did not reward additional years of school, then it could cause children (especially boys) to obtain less education (McKenzie and Rapoport, 2011).

The Bracero Program changed dramatically the family structure within the household as fathers were gone and mothers were in charge for some period of time (Rosas, 2011). The absence of the father in the household can negatively impact children and be detrimental to educational outcomes for children (Rosas, 2011; Sandefur and Wells, 1997). If fathers are not home, children may have to leave school to work and replace lost income (i.e., the father's absence might tighten the household income constraint). However, changing the bargaining position in a household bargaining model might shift household investment more toward a mother's preferences, and empirical evidence shows that when mothers are in charge of resources there are positive impacts on children, especially on girls (Duflo, 2003; Antman, 2011; Antman, 2015).

Just as the results from the current literature on the impact of migration on education are mixed, the results on the impacts of temporary worker programs are also mixed. Traditional work in the history and sociology literature stresses the negative impact of the Bracero Program, including how it perpetuated illegal migration and did little to increase economic development (Reichert and Massey, 1982; Massey and Liang, 1989), how it disrupted families (Rosas, 2011),

and how it provided very little in the way of investment opportunities back home in Mexico (Sandos and Cross, 1983). More recently, however, temporary worker programs have been shown to increase various development outcomes for Pacific Islanders (Gibson and McKenzie, 2010) and bracero migration has been shown to have increased short run investments in new businesses (Kosack, 2014).

Given the ambiguous a priori expectation about the direction of the impact of bracero migration on human capital investment, I take an empirical approach in this paper to identify the effect. I utilize a state-level dataset that I transcribed from the *Anuarios Estadisticos de los Estados Unidos Mexicanos* to estimate the impact of bracero migration from a given state in a given year on primary school enrollments, post-primary enrollments, primary school provision, and education spending. I employ state and year fixed effects in an ordinary least squares regression to account for any omitted variables that do not vary in a state over time or that are constant across states in a particular year. The estimates, however, are likely to be negatively biased by negative year-to-year shocks that both increase bracero migration and decrease human capital investment. In order to overcome this, I take advantage of unique institutional features of the program and use the distance of a state to the nearest bracero recruitment center in Mexico as an instrument for bracero migration. Instrumental variables estimates are larger than OLS estimates, confirming the negative bias that one would expect. Finally, I utilize individual microdata from the IPUMS sample of the 1970 Mexican Census to investigate heterogeneity in the effect of bracero migration on education by age and by gender.

Utilizing this empirical strategy, I estimate the causal impact of the Bracero Program on human capital investments to be significant and positive. 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. Decomposing the effect by age and gender reveals two important results. The positive effect exists for children aged nine to thirteen and so works at the marginal years of education just at the latter portion of primary school and the early part of secondary school. The effect is also stronger for girls than for boys, suggesting that mothers might be directing household resources more to their daughters than to their sons.

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; Antman, 2012). 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.

MIGRATION AND EDUCATION

In theory, migration can have varying impacts on human capital investments and economic development. When credit is available and borrowing is possible, investments in

education can be made in advance of the extra returns or extra income that will be realized as a result of that investment. In this case, temporary income shocks will not have any effect on investments unless they are substantial enough to alter permanent income. In a credit-constrained environment, however, investments are sensitive to current income shocks. Higher wages earned from a temporary stint in the United States can ease a liquidity constraint, allowing households to make higher investments in their children's education (Yang, 2008). Models of child labor, closely linked to the credit-constrained argument, can also be used to make predictions about the effect of migration on education. Baland and Robinson (2000) demonstrate how child labor might be high because imperfect capital markets keep children from transferring higher future earnings to earlier periods of forgone earnings through borrowing. Temporary income shocks for parents might relieve the constraints faced in early childhood, allowing parents to cover the high fixed costs of education and send their children to school instead of putting them in the labor force.

On the other hand, a temporary worker program in place could alter career choices available to young men. In essence, this changes the return to schooling for these men in Mexico. If this new, lucrative career does not reward human capital accumulated in Mexican schools, it could discourage human capital investments.

The disruption to the family unit and the absence of the father also could have negative effects on child development and educational attainment (Sandefur and Wells, 1997). Although, transferring charge of the household to mothers during the father's absence could have positive impacts on education. Antman (2011) shows how shifting the equilibrium in a household bargaining model and giving control of household resources to mothers can improve female

educational outcomes relative to male outcomes. Thus, the theoretical effect of bracero migration on childhood outcomes is ambiguous.

There exist empirical 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.

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

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

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.

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.

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

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.

HISTORICAL SETTING

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,

[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)

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 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).[4]

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

[4] Alston and Ferrie (1993) argue that the program ended in 1964 with agricultural advancements (the mechanization of cotton) and a withdrawal of political support by Southern politicians.

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. Either way, the migrant had to pay his

own way to get to the recruitment center in Mexico. 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.

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.[5] 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 Herrara, 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).

EMPIRICAL STRATEGY

[5] 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.

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 economic conditions are likely to be negatively correlated with economic outcomes of interest, then ordinary least squares (OLS) 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.

$$\log(Outcome)_{S,T} = \beta_0 + \beta_1 \log(Braceros)_{S,T} + \delta_S + \mu_T + \epsilon_{S,T} \qquad (1)$$

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 expected 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.

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.

In Figure 2 I provide a visual representation of the relationship between distance and bracero migration. I take the range of distances, divide it into 25 equal bins and graph the average for each bin. I also include a flexible polynomial fit through the data along with the 95% confidence interval. 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. In the regressions I run, however, I use the log of braceros and state and year fixed effects. To more closely match the actual variation in this specification, I reproduce the same picture in Figure 3 with the average of the residuals of the log of braceros (i.e., after state and year fixed effects are removed) against 25 equal bins of distance residuals (i.e., after state and year fixed effects are removed). Again, the figure shows a definite negative relationship between the migration of braceros and distance from recruitment centers, even if it is noisily estimated at the highest distances.[6]

[6] I have redone the analysis with alternate measures of distance and the results are qualitatively unchanged. These results are available upon request.

I conduct a more formal test of 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.

$$\log(Braceros)_{S,T} = \alpha_0 + \alpha_1 Distance_{S,T} + \delta_S + \mu_T + u_{S,T} \quad (2)$$

This is a regression of the log of the number of braceros who leave a given state in a given year on a measure of the distance of that state to the nearest recruitment center, state fixed effects, and year fixed effects. Table 1 shows the result of this estimation.[7]

These results confirm the pattern in Figures 2 and 3. The closer a state is to a recruitment center in a given year (i.e., the lower the distance between the state and the nearest recruitment center), the more braceros leave that state for the United States in that year. This result is highly statistically significant. An F-test that the excluded instrument is equal to zero is rejected with an F-statistic equal to 51. This is large enough to be sure that weak instruments will not cause inconsistency in the IV estimates (Bound, Jaeger & Baker, 1995).[8] 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.

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.

[7] The first stage results are qualitatively unchanged with alternate measures of distance. Results available upon request.

[8] This is the appropriate threshold when using standard errors robust to heteroskedasticity (i.e., White-corrected standard errors). In the IV regressions that I will estimate, the first stage will be checked with F-statistics that are adjusted for the appropriate level of clustering that I use.

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 (see Table 2 for a listing of recruitment centers by date). These changes resulted from negotiations between officials from the Mexican and United States governments. Every 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 cities 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).[9] 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)

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). 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 (see Figures 4 and 5). In renegotiations right after the war, the U.S. was no longer desperate, but

[9] 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).

Mexico was eager to have a bilateral policy in place. As a result, centers opened in northern cities (see Figures 6 and 7). 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 (see Figures 8 and 9). After the end of the Korean War the U.S. once again gained the advantage in negotiations and centers opened closer to the border (see Figures 10-12). 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.

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 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 will include a measure of PRI strength in the main IV equation to see what effect it might have. If it has no effect on the estimated coefficient measuring the effect of bracero migration, then it is not a concern.

DATA

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 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).[10] In Table 2 I list these locations and in Figures 4-12 I show the locations of these centers and how they change over time.

Using these locations, I create a measure of distance to the recruitment center for each state in Mexico at each point in time. In constructing this variable I must make assumptions to obtain distance measures at state by year level, which is the unit of analysis in this study. A point must be identified in each state to which distance can be measured from the city where the recruitment center was placed. In the main specification here, I use the centroid of the state, which I calculated using Geographic Information Systems (GIS).[11] Moreover, the recruitment centers change with the international agreements, which were negotiated in the middle of years. In order to associate a particular configuration of recruitment centers with a year, I must make an assumption about how long exposure to a recruitment center constitutes treatment. In the main specification here, I use a method whereby a year is associated with a recruitment center if the recruitment center was present for the majority (i.e., greater than six months) of the year.[12] This is the most conservative assumption I can make as recruitment centers could have had some effect even if there for less than six months. Using these assumptions, I have 720 state-by-year observations, measuring the shortest distance between the state's centroid and the nearest recruitment center city, over eight distinct configurations or regimes.[13]

[10] 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)

[11] Other methods include calculating distance to several, random points within a state and taking the average, or using a categorical measure of proximity or adjacency. Results using these alternate measures are qualitatively similar. Results available upon request.

[12] Another method would be to consider a recruitment center associated with a particular year if it existed for any part of that year. Results using this method are qualitatively unchanged. Results available upon request.

[13] Distances are calculated as geodetic distances using STATA's *geodist* command.

Secondly, I collect state-level characteristics from the *Anuarios Estadisticos 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 Estadistica y Geografia (INEGI)*. The independent variable of interest that I collect is the number of braceros leaving each state in a given year. For the years 1942 through 1954, the statistical yearbooks provide the number of braceros leaving a state, while they change the name to agricultural migrants for the years 1958 through 1964. The yearbooks provide no data about braceros for the years 1955 through 1957.[14] I also transcribe various educational outcomes at the state level. Primary school enrollments are available for all years except 1961. The number of primary schools is available for all years, with a distinction between rural and urban schools made through 1961. State spending on education is available for all years except for 1963. Post-primary school enrollments by gender, including several different types of post-primary schooling, are available from 1950 and later. This data collection process yields a dataset of state-by-year educational outcomes for 29 states, two territories and one federal district over the 24 year period, from 1942 to 1965.

Thirdly, I compile election data to be used in a robustness check of the main results. 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 strength of a PRI win in the previous presidential election. Specifically, I calculate the percentage of votes for the PRI in the previous election.[15]

[14] These data were all provided to INEGI from the Mexican Department of the Interior.
[15] Additional measures of the political strength of the PRI can be used. Results using additional measures are qualitatively unchanged. Results available upon request.

Fourthly, I utilize microdata from the one percent Integrated Public Use Microdata Series, International (IPUMS International) sample of the 1970 Mexican General Population and Housing Census to create state-level variables describing schooling by age and gender. The census provides a snapshot of individuals and their schooling outcomes. I use this along with some assumptions to create variables that describe the proportion of a given age and gender group in school in a given state and year (e.g., the proportion of six year old males who are in school in Guanajuato in 1947). The census provides the individual's gender, age, years of schooling, and state of birth. The first assumption I make is that an individual remains in their state of birth for the entirety of their childhood. The second assumption I make is that an individual starts school at age six, which is the age most children in Mexico start primary school. The third assumption I make is that children attend school continuously and without major breaks. Using the IPUMS sample and these assumptions, I count the number of individuals in a particular age and gender group for a given state and year. Then, I count the number of those individuals who were in school. For example, consider an individual in the 1970 IPUMS sample who was born in Sonora, is male, is 20 years old and completed 3 years of education. This individual would be counted as a six year old boy in Sonora in 1956, a seven year old boy in Sonora in 1957, etc. Furthermore, this individual would be counted as a six year old boy in school in Sonora in 1956, a seven year old boy in school in Sonora in 1957, an eight year old boy in school in Sonora in 1958, but a nine year old boy not in school in Sonora in 1959. Dividing those in school by the total in each age-by-gender-by-state-by-year group gives an estimate of the proportion of each group in school by state and year.

Describing the Sample

I summarize the data from the *Anuarios* in Table 3.[16] 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 primary 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 primary enrollments than in rural primary enrollments.[17] The average state has 858 primary schools in a given year. The average state in an average year has 13,646 students enrolled in post-primary schools, although there is significant variation across space and time. Post-primary enrollments are generally higher for males than for females (i.e., a mean of 8,475 for the former and only 5,171 for the latter), although there is a greater dispersion in male, post-primary enrollment. 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.

The aggregated microdata from the IPUMS sample of the 1970 Mexican census are shown in Table 4.[18] This table gives the mean proportion of a given age and gender group in school, averaged over all state-by-year observations. For example, on average, 80 percent of six year old males were in school over the sample period. One thing to note is that females are always less likely than males to be in school. This ranges from two percent to six percent less

[16] Mexico's Distrito Federal and two territories (Baja California Sur and Quintana Roo) could account for the outliers in this table. Main results omitting these entities are qualitatively similar. Results available upon request.

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

[18] Mexico's Distrito Federal and two territories (Baja California Sur and Quintana Roo) could account for the outliers in this table. Main results omitting these entities are qualitatively similar. Results available upon request.

likely to be in school across all age groups. Moreover, there is a monotonic decrease in the likelihood of attending school. That is, six year olds are the most likely to be in school, seven year olds are less likely than six year olds but more likely than eight year olds, etc. The means here show that attending school was more likely than not for the first three to four years of primary school, but thereafter became relatively unlikely for both males and females in Mexico in the middle of the twentieth century.

ESTIMATION AND RESULTS

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. In this section, I will explore the effect of bracero migration on both primary and post-primary school enrollments.

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.[19] 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 10% 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.

[19] For the IV estimation I cluster standard errors at the state x regime level because that is the level at which treatment (i.e., recruitment center placement) varies. To be consistent, I cluster the OLS results here at the same level.

These OLS models suggest a positive relationship between bracero migration and primary school enrollments.

I also estimate the model using OLS, regressing the log of post-primary enrollments on the log of bracero out migration and state and year fixed effects. The results are given in Table 5. A 10% increase in the number of braceros leaving a given state in a given year is associated with a 0.04% increase total post-primary enrollment, a 0.01% decrease in male post-primary enrollment, and a 0.08% increase in female post-primary enrollment. The estimated coefficients on total post-primary enrollments, male enrollments and female enrollments are all statistically insignificant. The OLS results hint at a positive relationship between bracero migration and post-primary enrollment in general, although it might be slightly negative for males. This could be because males choose to migrate as braceros as they get older instead of pursing post-primary education. More importantly, however, these OLS results demonstrate that bracero migration is likely to have a bigger positive effect for females than for males, possibly because female heads of household direct resources to female children. It is important to remember that these estimates are likely to be negatively biased, and the IV results will provide us with a relationship that has a causal interpretation.

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 that I explained previously. A 10% increase in the number of braceros that leave a state in a given year causes a 0.7%, 0.5%, and 0.7% increase in the number of children enrolled in urban primary schools, rural primary schools, and

all primary schools, respectively. 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 and 124,319 enrolled in primary schools. The estimated effect of 0.7% would imply that increasing the number of braceros that leave the state by about 520 braceros would increase total primary enrollments by 870 students.

The IV results for post-primary enrollments, although not statistically significant, are informative. The point estimates obtained through IV estimation imply that a 10% increase in the number of braceros leaving a given state in a given year leads to a 1% increase in total post-primary enrollments, a 0.2% increase in male enrollments, and a 1.5% increase in female enrollments. Most importantly, the IV estimates reveal that the effect on post-primary education is much larger for females than for males. This could be because males are choosing to become braceros instead of pursing post-primary education, because female heads of household have more control over household resources and direct those resources to female children, or both.

Heterogeneity in the Effect of Bracero Migration on Schooling

Simply looking at the aggregate effects on primary and post-primary enrollments could mask heterogeneity in the impact of bracero migration on enrollments by age and by gender. Using the IPUMS microdata and the constructed measure giving the proportion of each age and gender group in school for each state and year, I utilize the same instrumental variables strategy to explore the effect on each age and gender group. Specifically, I utilize two stage least squares to estimate the model given in Equation 1, using the proportion of a given age and gender group (e.g., six year old males) as the outcome. Again, I instrument the log of the number of braceros leaving a given state in a given year with the distance to the nearest recruitment center in that

year. The results of the estimation are given separately for males and females in Table 7 and Table 8, respectively.

The first important result from this analysis is that the effect of bracero migration on schooling appears to occur at the margin. The majority of six year olds are in school, and so, not surprisingly, there is little impact at this age. In the latter years of primary school and the early years of secondary school (ages nine through thirteen), however, schooling is less prevalent and I find significant, positive effects. At this time, these were the marginal years of education for the vast majority in Mexico. For males, a ten percent increase in the number of braceros leaving a state causes between a 0.1 and 0.2 percentage point increase in the proportion of nine, ten, eleven, twelve and thirteen year olds in school. These effects are statistically significant at ages nine, eleven and twelve. For females, a ten percent increase in the number of braceros leaving a state causes between a 0.1 and 0.3 percentage point increase in the proportion of nine, ten, eleven, twelve and thirteen year olds in school. These effects are statistically significant at ages ten, eleven and thirteen. The estimates are not statistically different from zero for ages below nine or for ages above thirteen. I graph the estimated effects on enrollment against the change in average enrollment from the previous age cohort in Figure 13. This figure illustrates how the biggest effects are found at the most marginal years of education (i.e., those ages with the biggest drops in enrollment over the previous age group). The Bracero Program increased schooling for both boys and girls, but only at the margin. That is to say, it operated at the intensive margin. It increased schooling by a few years for those students already in primary school, but did not cause new students to enter primary school.

The second important result from this analysis is that the effect, although positive for both males and females, is generally greater for female children. For example, consider eleven

year old males and eleven year old females. This is an age group for which the effect is statistically significant for both genders. A ten percent increase in the number of braceros leaving a state increases the proportion of eleven year old males in school in that state by 0.2 percentage points and increases the proportion of eleven year old females in school in that state by 0.3 percentage points. In percentage terms, taken at the average, this is a 0.6 percent increase for eleven year old males and a one percent increase for eleven year old females. The effect on female education is nearly double the effect on male schooling. Eleven year olds are too young to migrate as braceros, so this is not likely to be because males are choosing migration over school. Figure 13 rules out the possibility that girls are simply more marginal students as enrollment changes are nearly identical for boys and girls. It is suggestive, however, of female heads of household controlling resources and directing those resources to all children but disproportionately more to their daughters.[20]

The Effect of Bracero Migration on Investments by the State

I examine the impact of bracero migration on human capital investments by the 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

[20] This pattern could be explained by other phenomena. For example, it could be that male children must forgo schooling to work at home in place of their fathers who are working in the United States.

since state budgets are already set. The earliest any effect should be felt is one year later.[21] 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 0.2% 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 0.2% increase in the number of primary schools in the state in the next year, and a 1.7% increase in the number of pesos spent on education by the state government in the next year. The point estimate for primary schools is not statistically different from zero.[22] The effect on state education spending, however, is highly statistically significant. To put the effect in perspective, consider an average state in an average year with 5,199 braceros leaving and 10.1 million pesos spent on education.

[21] 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.

[22] 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.

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 171,700 pesos.

Robustness Check

The main threat to the identification strategy used here is a violation of the exclusion restriction and endogenous placement of the recruitment centers. In other words, the exclusion restriction would fail if there were some factor that influenced both the placement of the recruitment centers and human capital investments. A major concern here is one of political maneuvering and the use of investments by the main political party to garner support. At this time, Mexican politics were dominated by the PRI. If the PRI sensed that they were losing support in a particular area, they could try to buy votes by making favorable investments in that area. For example, recruitment centers might be placed to make it easier for people to travel to the United States as braceros and they might have invested more in education in that area, all in an attempt to gain favor with the people and get their vote. If this were the case, one might see recruitment centers and greater educational investments by the government in a given state in a given year when PRI support is relatively low. To be very clear, there is no variation at the state level in national election results. The PRI presidential candidate won in every state during this time and so the year fixed effect accounts for PRI strength in terms of whether they won the election or not. The PRI, however, might have funneled resources to areas in which they won by relatively fewer votes.

To this end, I utilize presidential election data and include a variable that measures that percentage of the vote in a state that went for the PRI candidate in the last presidential election in the main IV regressions. I check to see whether the estimated coefficient on bracero migration is

sensitive to the inclusion of this measure of PRI strength. The results of the estimation are presented in Table 9. The coefficient on PRI strength in the previous election is only statistically significant in the regressions for rural primary school enrollments and primary schools. In all other specifications it is statistically insignificant. More importantly, the estimated coefficients on bracero migration in this analysis are relatively unchanged when compared to the estimates in the main specification in Table 6. I conclude that political maneuvering by the PRI is not a threat to this empirical strategy. Even if I control for it, however, I find increases in primary school enrollments and education spending resulting from bracero migration that are consistent with those in the main specification.

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. Furthermore, the Bracero Program temporarily changed the household structure, putting mothers in charge of household resources as fathers were absent. 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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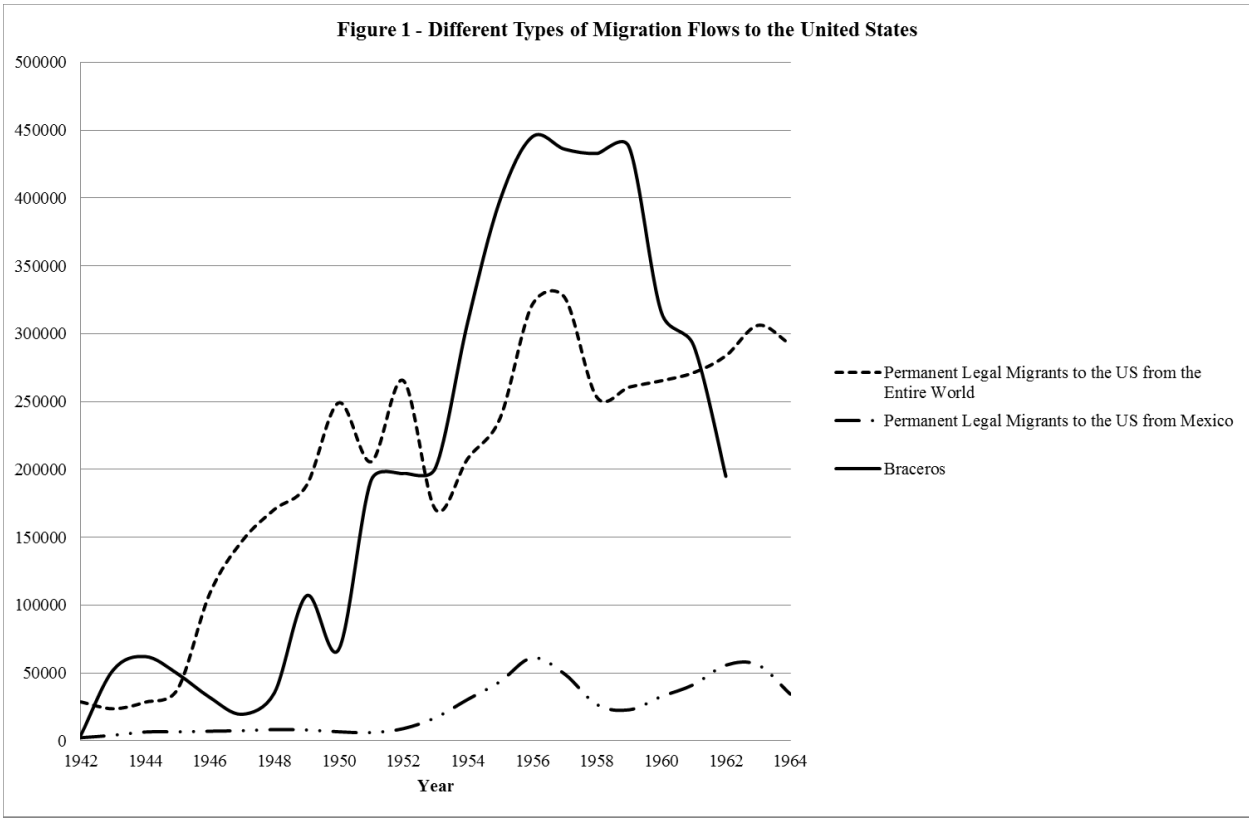
FIGURES AND TABLES

Figure 1 – Comparing Bracero Flows to Other Migrant Flows to the United States



Various Sources, Available Upon Request

Figure 2 - Average Bracero Flow by Distance Bin

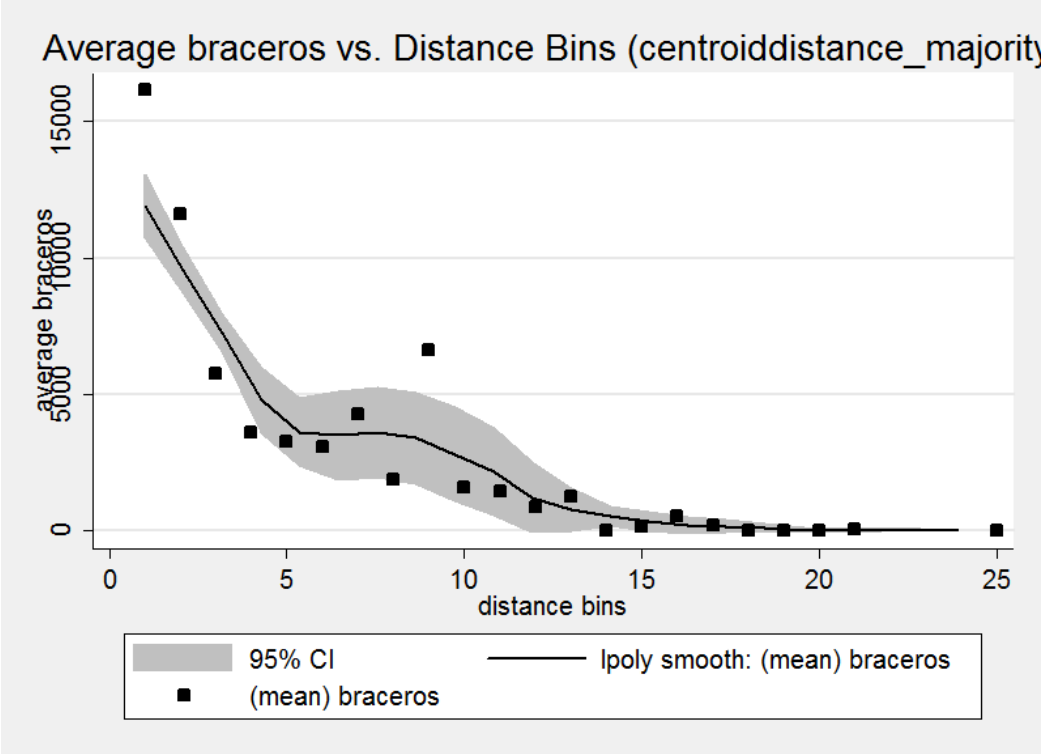


Figure 3 - Average Log Bracero Residual by Residual Distance Bin

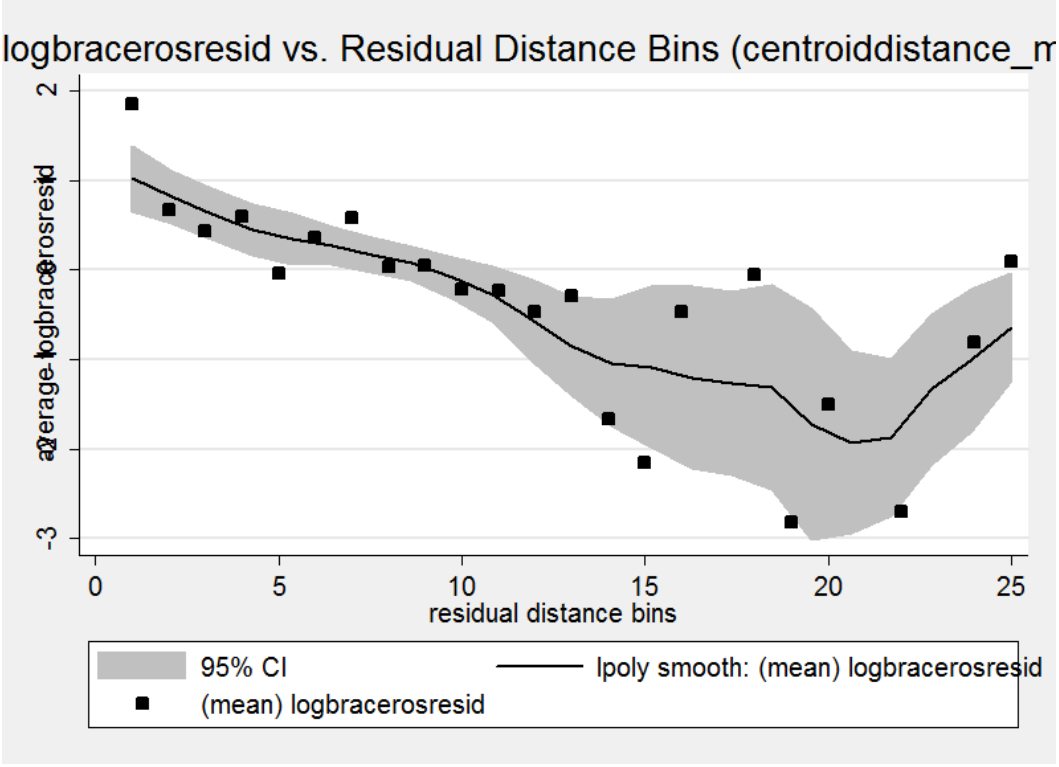


Figure 4

Recruitment Centers 1942-1943

Figure 5

Recruitment Centers 1944-1946

Figure 6

Recruitment Centers 1947-July 31, 1949

Figure 7

Recruitment Centers August 1, 1949-August 10, 1951

Figure 8

Recruitment Centers August 11, 1951-May 18, 1952

Figure 9

Recruitment Centers May 19, 1952-March 9, 1954

Figure 10

Recruitment Centers March 10, 1954-April 13, 1955

Figure 11

Recruitment Centers April 14, 1955-January 31, 1962

Figure 12

Recruitment Centers February 1, 1962-December 31, 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)

Figure 13—Average Enrollment Changes by Age and Gender vs. Estimated Enrollment Effect

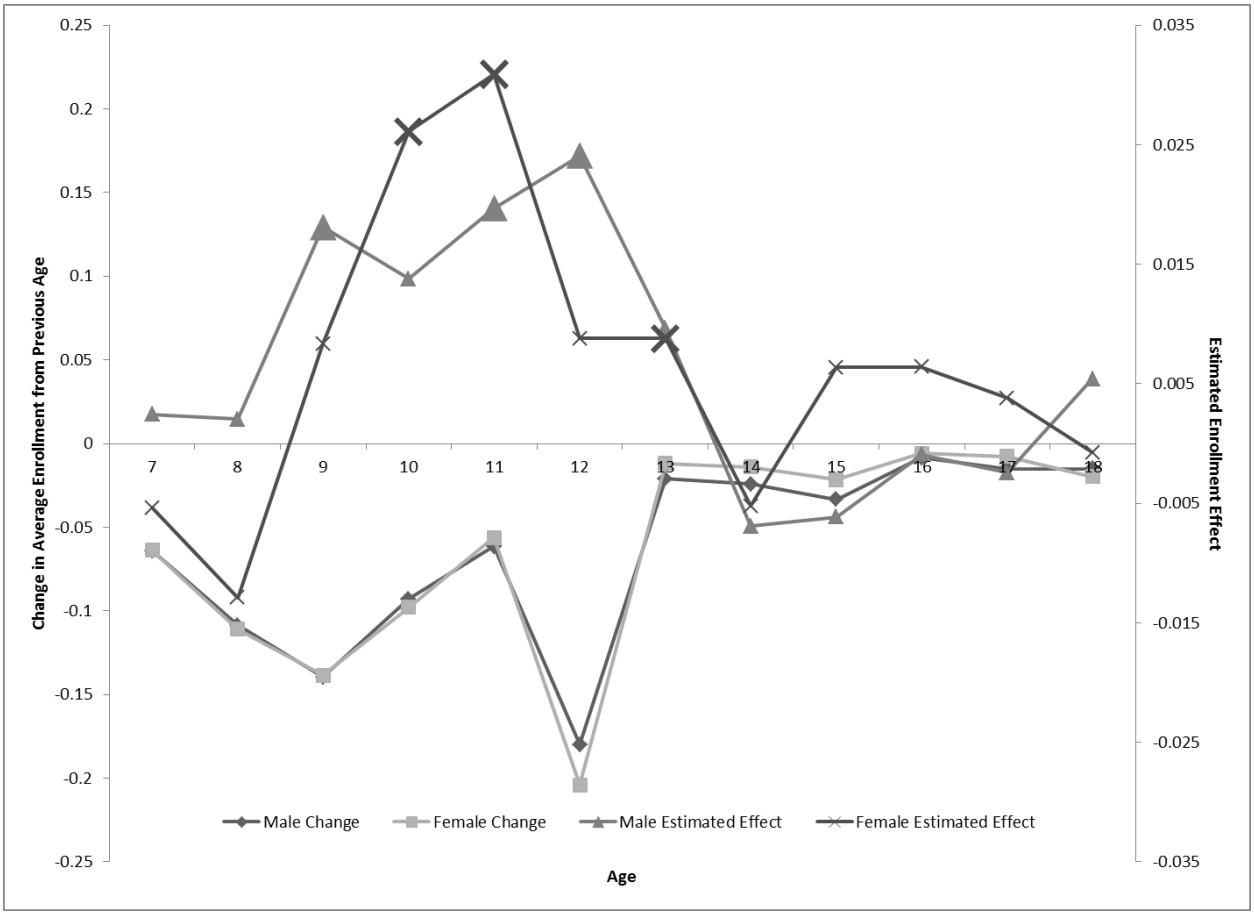


Table 1 – First Stage Relationship

VARIABLES	(1) logbraceros
centroiddistance_majority	-0.00173***
	(0.000242)
Constant	4.235***
	(0.314)
F Test for Joint Significance	51
Observations	620
R-squared	0.824

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2 – Recruitment Centers

Table 1 – Mexican Recruitment Centers over Time	
Date	***Recruitment Centers***
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 TIAS 1968, TIAS 2260, TIAS 2328, TIAS 2331, TIAS 2586, TIAS 2932, TIAS 3242, and TIAS 5160; Recruitment Center locations taken from Galarza (1964)

Table 3 – Summary Statistics for Data from the *Anuarios*

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
Post-Primary Enrollment, Total	512	13,646	34,620	0	392,653
Post-Primary Enrollment, Male	512	8,475	23,328	0	268,322
Post-Primary Enrollment, Female	512	5,171	11,383	0	124,331
Education Spending by State Governments	693	10,100,000	16,300,000	0	118,000,000

Table 4 – Average Proportion in School by Age and Gender

Age	Male	Female
6	0.8054643	0.768339
	(0.1101761)	(0.1442048)
7	0.7413254	0.7046524
	(0.1304995)	(0.1625677)
8	0.6326289	0.5936208
	(0.1647499)	(0.1823135)
9	0.4931067	0.455125
	(0.1819704)	(0.1871338)
10	0.4002518	0.3572206
	(0.1798316)	(0.1763382)
11	0.3388912	0.3010337
	(0.1664998)	(0.1605308)
12	0.1589249	0.0970241
	(0.1129642)	(0.0727975)
13	0.1378911	0.0849989
	(0.1060098)	(0.0694879)
14	0.1136795	0.0709157
	(0.0944947)	(0.064018)
15	0.0803426	0.0492191
	(0.0745077)	(0.0526792)
16	0.0718197	0.0432559
	(0.0711832)	(0.0497726)
17	0.0569019	0.0356404
	(0.0629355)	(0.0451894)
18	0.0418812	0.0158379
	(0.0567469)	(0.0255897)

Table 5 – OLS Results (Data from the *Anuarios*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	logurbanprimaryenrolled	logruralprimaryenrolled	logprimaryenrolled	logprimaryschools_1	logstateeducationspending_1	logpostprimaryenrolledtotal	logpostprimaryenrolledmen	logpostprimaryenrolledwomen
logbraceros	0.00711	0.0137*	0.00654	-0.00861*	0.0175	0.00451	-0.00150	0.00856
	(0.00641)	(0.00736)	(0.00549)	(0.00477)	(0.0156)	(0.0176)	(0.0176)	(0.0223)
Constant	8.946***	8.830***	9.612***	5.067***	11.44***	6.833***	5.956***	6.237***
	(0.0781)	(0.0557)	(0.0519)	(0.0361)	(0.207)	(0.163)	(0.184)	(0.199)
Observations	589	580	589	620	558	374	374	374
R-squared	0.981	0.939	0.986	0.984	0.917	0.966	0.963	0.948

Standard errors clustered at the state X regime level.
*** p<0.01, ** p<0.05, * p<0.1

Table 6 – IV Results (Data from the *Anuarios*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	logurbanprimaryenrolled	logruralprimaryenrolled	logprimaryenrolled	logprimaryschools_1	logstateeducationspending_1	logpostprimaryenrolledtotal	logpostprimaryenrolledmen	logpostprimaryenrolledwomen
logbraceros	0.0723*	0.0551*	0.0713**	0.0174	0.168***	0.101	0.0170	0.146
	(0.0398)	(0.0311)	(0.0343)	(0.0211)	(0.0582)	(0.102)	(0.0924)	(0.136)
Constant	8.709***	8.685***	9.377***	4.973***	10.90***	7.660***	7.456***	6.741***
	(0.172)	(0.122)	(0.142)	(0.0883)	(0.295)	(0.895)	(0.818)	(1.197)
Observations	589	580	589	620	558	374	374	374
R-squared	0.975	0.936	0.979	0.982	0.903	0.962	0.963	0.940
KP F-Stat	29.93	27.06	29.93	29.47	25.86	5.698	5.698	5.698

Standard errors are clustered at the state x regime level.
*** p<0.01, ** p<0.05, * p<0.1

Table 7 – IV Results by Age for Males (Data from IPUMS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
VARIABLES	6 Year Olds	7 Year Olds	8 Year Olds	9 Year Olds	10 Year Olds	11 Year Olds	12 Year Olds	13 Year Olds	14 Year Olds	15 Year Olds	16 Year Olds	17 Year Olds	18 Year Olds
logbraceros	0.00218	0.00243	0.00203	0.0181*	0.0138	0.0197**	0.0241***	0.00965	-0.00692	-0.00614	-0.000918	-0.00243	0.00543
	(0.00793)	(0.00641)	(0.00971)	(0.0108)	(0.0114)	(0.0100)	(0.00750)	(0.00824)	(0.0110)	(0.00720)	(0.00738)	(0.00874)	(0.00408)
Observations	619	620	620	620	619	619	619	619	620	618	620	619	620
R-squared	0.331	0.362	0.435	0.505	0.534	0.467	0.348	0.356	0.294	0.206	0.151	0.089	0.045
Number of id	32	32	32	32	32	32	32	32	32	32	32	32	32
KP F-Stat	36.95	36.98	36.98	36.98	36.49	36.91	36.94	36.95	36.98	36.58	36.98	36.95	36.98

Standard errors clustered at the state level.
*** p<0.01, ** p<0.05, * p<0.1

Table 8 – IV Results by Age for Females (Data from IPUMS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
VARIABLES	6 Year Olds	7 Year Olds	8 Year Olds	9 Year Olds	10 Year Olds	11 Year Olds	12 Year Olds	13 Year Olds	14 Year Olds	15 Year Olds	16 Year Olds	17 Year Olds	18 Year Olds
logbraceros	-0.00344	-0.00539	-0.0129	0.00837	0.0261***	0.0309***	0.00880	0.00878*	-0.00523	0.00637	0.00639	0.00379	-0.000752
	(0.00774)	(0.00989)	(0.00788)	(0.0101)	(0.00933)	(0.0103)	(0.00626)	(0.00490)	(0.00874)	(0.00600)	(0.00589)	(0.00400)	(0.00197)
Observations	620	620	619	619	618	619	619	619	620	620	618	618	616
R-squared	0.374	0.436	0.412	0.545	0.508	0.407	0.347	0.245	0.240	0.184	0.148	0.135	0.050
Number of id	32	32	32	32	32	32	32	32	32	32	32	32	32
KP F-Stat	36.98	36.98	36.49	36.91	36.42	36.95	36.95	37.02	36.98	36.98	35.85	36.63	36.31

Standard errors clustered at the state level.
*** p<0.01, ** p<0.05, * p<0.1

Table 9 – Robustness of the Results to PRI Strength

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	logurbanprimaryenrolled	logruralprimaryenrolled	logprimaryenrolled	logprimaryschools_1	logstateeducationspending_1	logpostprimaryenrolledtotal	logpostprimaryenrolledmen	logpostprimaryenrolledwomen
logbraceros	0.0741**	0.0456*	0.0697**	0.0123	0.168***	0.116	0.0313	0.156
	(0.0372)	(0.0274)	(0.0311)	(0.0190)	(0.0602)	(0.106)	(0.0923)	(0.143)
percentpri_last	-0.132	-0.469**	-0.213	-0.246**	0.0882	0.471	0.438	0.287
	(0.183)	(0.223)	(0.160)	(0.103)	(0.504)	(0.393)	(0.308)	(0.531)
Constant	8.823***	9.148***	9.577***	5.217***	10.82***	7.112***	6.946***	6.406***
	(0.199)	(0.228)	(0.165)	(0.116)	(0.609)	(1.092)	(0.872)	(1.522)
Observations	588	579	588	619	557	374	374	374
R-squared	0.975	0.938	0.979	0.983	0.903	0.961	0.963	0.939
KP F-Stat	28.12	25.61	28.12	27.66	24.33	5.526	5.526	5.526

Standard errors clustered at the State X Regime level.

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