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**THE INDIGENOUS HETEROGENEITY OF OPORTUNIDADES:
AMPLE OR INSUFFICIENT HUMAN CAPITAL ACCUMULATION?**

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Abstract:

Indigenous groups account for over one tenth of Mexico's population and many of them suffer from constant social disadvantages and extreme marginalization. One of their few paths out of poverty is through the accumulation of human capital, which is a central element of Oportunidades' strategy to ameliorate trans-generational poverty. This study finds that the positive impacts of Oportunidades on enrollment for the general population are no different for indigenous households. In addition, it finds that Oportunidades impacts on repeat and illness rates are consistently marginal. Thus, it is argued that unless tailored investment in indigenous human capital accumulation and complimentary alternatives are intensified to close the existing indigenous marginalization gaps, indigenous Mexicans will remain in profound and persistent poverty due to the unique and overwhelming obstacles they face.

1. Introduction:

Over 40 million indigenous people live in Latin America, making up approximately 8% of its population.¹ Regrettably, indigenous populations in the region (and beyond) are seriously disadvantaged. They are more likely than any other group to be poor and live in generally abysmal conditions.² Indigenous Latin Americans possess considerably lower endowments of human capital, are more than twice as likely to be employed as youths, and earn less on average than their non-indigenous counterparts.³ Not surprisingly, there is a strong correlation between schooling attainment, ethnicity, and poverty incidence in the region.⁴ Although paths out of poverty do exist, they are difficult to identify, challenging, and scarce. As a result, reducing education, health, and nutrition gaps is often one of the clearest, most significant, and readily available ways to minimize earning differentials and alleviate poverty, especially for indigenous populations.⁵ Oddly enough, antipoverty policies in the region have not historically focused on the lack of investment in human capital as a fundamental reason for the persistence of poverty.⁶

The largest indigenous population in Latin America lives in Mexico: approximately 12 million people, accounting for 13% of its total population.⁷ Unfortunately, their experience has been no better than that of other indigenous groups in the region. One empirical study illustrates that over 80% of the Mexican indigenous population lives in regions with a very high level of marginalization.⁸ It also shows that just under 80% of economically active citizens living in especially indigenous states, such as Oaxaca, Chiapas, Guerrero, Hidalgo, Puebla, and Yucatan, earn less than minimum salaries.⁹

Subsequently, municipalities with indigenous populations above 40% have an incidence of extreme poverty (around 45%) that is nine times as high as the rate for municipalities with less than a 10% indigenous population (a 5% incidence).¹⁰ This high level of persistent poverty

exacerbates the need for indigenous youths in Mexico to join the workforce (to make ends meet) and abandon their formal education, which stunts their human capital attainment and future earning opportunities. The same study above finds that indigenous children in Mexico are 13% more likely not to be in school than their non-indigenous counterparts and more likely to work.¹¹

Though indigenous groups in Mexico are distinctly marginalized, poverty is not a critical disadvantage unique to them. Despite numerous anti-poverty efforts, such as PRONASOL and PROCAMPO, approximately 20% of all Mexicans were extremely poor in 1995 – 40% of them being rural children whose welfare is awfully vulnerable.¹² This dire state of affairs, a product of years of social and economic exclusion, was greatly exacerbated by Mexico's 1994 Peso Crisis, which worsened conditions for the poor, squeezed public finances, and dried up social spending.¹³ As a result:

“More than one fifth of all families were unable to purchase a basic food basket to meet their nutritional needs, affecting their health, ability to learn, opportunities for employment, and their access to higher income. In some communities, malnutrition was the third cause of infant mortality; close to 10 million Mexicans lacked regular access to basic health care; more than 1.5 million children between the ages of 6 and 14 were out of school; and in disadvantaged communities illiteracy tripled the national average, and school dropout and failure rates doubled it...”¹⁴

Moreover, a national census from 1994/1995 indicated that 18.6% of children were short for their age, nearly equivalent to a two year lag in growth.¹⁵ Prevalence of malnutrition and stunting was highest in Chiapas and Oaxaca, two of the most southern and indigenous states in Mexico.¹⁶ Making this worse is the lack of health services available to the poor. This is reflected by the fact that the infant mortality rate for the poor (49 per 1,000 live births) is twice as high as the rate for the non-poor.¹⁷ Compounding this situation is the finding that almost half of poor children age fifteen and older did not complete primary school; this is the case with only one in five non-poor children.¹⁸ In addition, over 30% of poor children age twelve to fifteen

work to support their families, which negatively impacts their schooling.¹⁹ Poor households, on average, have one and a half more family members (5.8) than non-poor families and live in twice as crowded dwellings (3.8 individuals per room).²⁰ Moreover, 60% of people working in rural areas are landless and 56% of rural production units reported absolutely no production or were used strictly for subsistence consumption.²¹ It becomes evident that rural individuals have little access to assets other than their own labor and Mexico's poor (many of whom are rural) are in dire need of support.

In order to combat these issues of poverty and disparity for both indigenous and non-indigenous population, the Social Development Department of the Mexican government (SEDSOL) launched a program in August 1997 by the name of PROGRESA – the Education, Health, and Food Program, of Mexico – now known as Oportunidades.²² It is designed to increase the human capital of poor households via the disbursement of conditioned cash transfers. Oportunidades provides conditioned cash transfers to mothers of poor families (primarily in rural areas where poverty is three times more likely than in urban areas) every two months, if the household is poor enough and its members meet certain co-responsibilities.²³ Attending periodic medical check-ups and health talks or having children attend at least 85% of school days during the previous two month period are examples of the program's conditions.²⁴ It should also be noted that Oportunidades' design and implementation, which will be explained later in section five, is particularly unique not only because of its mix of components, but also because of its experimental design that facilitates rigorous evaluation of its impacts.²⁵

As such, the program aims to minimize current poverty levels and increase the future productivity of children from poor families to improve household welfare in the long run. By 1999, Oportunidades covered roughly 2.6 million households, nearly one 9th of all Mexican

families, and 40% of all rural households at a cost of \$777 million (0.2% of 1999's Gross Domestic Product – GDP).²⁶ Since then it has significantly expanded its efforts to become the most comprehensive conditional cash transfer program in the world.²⁷ Oportunidades recently culminated its eighth year of operations with over 5 million poor Mexican beneficiary households on its roster (or approximately 30 million people).²⁸ It currently spends approximately US \$2.7 billion a year and plans to continue growing based on its success.²⁹

A number of papers (which will be briefly summarized later) have been written assessing this program's impact on a variety of factors, such as dropout rates, anemia rates, child labor, consumption, and severity of poverty; nonetheless, Oportunidades' impact on Mexico's indigenous population has not received much attention.³⁰ Consequently, this paper is devoted to assessing the impact of Oportunidades on the capital accumulation of Mexico's indigenous poor. It aims to distinguish the program's impacts for indigenous beneficiaries from impacts for the general or average beneficiary population. In other words, this study tests *the hypothesis that the impact of Oportunidades on human capital (measured by school enrollment, progression, repeat, and illness rates) will differ between the general beneficiary population and indigenous beneficiary population.*

The remainder of this paper is organized as follows: Section 2 details the intricacies of Oportunidades and section 3 provides the conceptual framework this study is based upon. Next, section 4 describes the data analyzed and section 5 explains the triple difference estimator used to assess Oportunidades. Lastly, section 6 shares this paper's findings and section 7 concludes by highlighting its policy implications.

2. A Description of Oportunidades

A. The Implementation of a Multi-pronged Approach:

Poverty alleviation programs:

“...must try to eliminate, or at least reduce, the trade-off between income transfers that increase present consumption and income transfers that facilitate investments to enable more consumption in the future...” to unlock opportunities for people to eventually get ahead with their own efforts.³¹

In the long run Oportunidades’ strategy is based on human capital theory (which is examined in the following section) and aims to act as a safety rope that helps people climb out of poverty by preventing the transmission of intergenerational poverty.³² In the short term, its approach is rooted in the idea that poor families are unable to overcome the bevy of constraints they face now; thus a subsidy from the outside is needed to make ends meet. Oportunidades also acts as a safety net that catches tremendously marginalized households and props them up before they fall further below a predetermined poverty threshold. In essence, Oportunidades is “an effort to break the entangling web of poverty where malnutrition, morbidity, high infant mortality rates, high fertility, school dropout rates and unhealthy living conditions prevail.”³³ This is accomplished not only by providing incentives (via transfers) that lower opportunity costs, but also by bolstering the supply of services and actively promoting their use.³⁴

The initial implementation of Oportunidades involved four distinct stages that were focused on targeting and treating exceptionally poor families in a manner that would allow for subsequent rigorous evaluation. The first stage involved the detection of the most marginal, rural communities where the extremely poor households were likely to be found.³⁵ This was based on a marginality index (developed from national census data) and took into account geographical location, locality size, distance between localities, and access to supporting infrastructure (such as a secondary school or health clinic).³⁶

In order to facilitate the distribution of benefits, implementation of the program takes place in a random geographic manner (due to funding limitations); however, in practice the thrust of Oportunidades is family-based.³⁷ Its focus is on directly transferring resources to the households in extreme and structural poverty who can benefit from Oportunidades the most.³⁸ Though all impoverished families are in need of help, not all poor households are equally poor. Consequently, Oportunidades' initial implementation has aimed to reach families who suffer from the greatest depth and severity of poverty first. One empirical study estimates that the depth of poverty in 1994 experienced by a rural household was four times the depth experienced by an average household (including both rural and urban).³⁹ The finding suggests that a rural household's depth of poverty was ten times higher than an urban household's.⁴⁰ Similarly, the same study finds that the severity of poverty experienced by a rural household is approximately three times higher than an average household's.⁴¹ This estimate implies that a rural household's severity of poverty was twelve times higher than an urban household's.⁴² Once again, this underscores the need to target rural households.

The second stage involved the selection of treatment and control households within eligible communities via a discriminant analysis of household income and other characteristics.⁴³ During the third stage, a scoring system based on objective data, such as a standardized poverty line, was applied to individual questionnaires in order to ensure that the poor receive far consideration regardless of where they live.⁴⁴ Finally, lists of eligible beneficiaries were presented at community assemblies where amendments were made and final approval was granted so that treatment could begin.⁴⁵ This method of implementation has paid dividends: all communities selected to be Oportunidades participants took advantage of the program and the household take-up rate was (and continues to be) over 90%.

Unlike other social programs in Mexico, Oportunidades is multi-pronged – it deals with health, nutrition, and education simultaneously. Addressing these issues together leads to greater social returns than individual interventions.⁴⁶ This is because “deficiencies in education, nutrition and health are both cause and effect of persistent marginalization, and that they are closely interrelated.”⁴⁷ Justifying for Oportunidades’ multi-pronged approach is clear in the empirical literature, which demonstrates links between (i) food supply, nutrition, and health, (ii) infant mortality, fertility, and health, (iii) family size, income, and education, as well as (iv) low income and risk aversion.⁴⁸

Moreover, Oportunidades’ strategy takes advantage of positive cross-life cycle synergies, such as the impact of preschool nutrition on schooling success, adult wages, and productivity.⁴⁹ In other words, health and nutrition enhancements, which are valuable on their own, will directly enhance the effectiveness of education via school attendance and performance improvements for the poor today, which will pay dividends in the long run.⁵⁰ Oportunidades takes this multi-pronged approach because it is the most suitable way to break the vicious cycle of poverty that perpetuates itself across generations. These synergies between education, health, and nutrition interventions are necessary to manifest positive short term outcomes and those that are lagged over time.⁵¹

It should also be noted that these interconnected benefits must be sustained over time to truly make a substantial impact on the eradication of poverty.⁵² This is because advancements in education, health, and nutrition are results of a cumulative process, not temporary surges. Consequently, Oportunidades tries to provide “a comprehensive, continued, and long-term approach to establish conditions for poor families to take advantage of opportunities created by economic growth and broad social policy programs, and to lay the groundwork for a lasting

improvement in their incomes and quality of life.”⁵³ This is the explanation for why Oportunidades’ system of interventions can begin at birth and last through high school graduation and pregnancy.

In essence, the program fights a spiraling web of chronic poverty by attacking it at multiple levels and times. Although the structure of Oportunidades is complicated, it is also flexible enough to meet the needs of impoverished families in widely varying circumstances. In order to maximize the benefits associated with Oportunidades, the program also works in conjunction with numerous other complimentary projects. Examples include interventions that focus on generating employment and diversifying income options (such as the Temporary Employment Program), as well projects that developing promote the formation of physical capital (such as the State Municipal Social Infrastructure Fund). In combination, it employs this strategy to meet the following six objectives:⁵⁴

“(i) integrate and systematize measures to improve the educational, health, and nutritional status of families living in extreme poverty; (ii) aid children complete basic education eliminating their need to perform tasks that interfere with school attendance, and prevent school performance from being affected by illness or diet deficiencies; (iii) eliminate malnutrition, lower morbidity, mortality and fertility rates, and improve family health through a preventative approach including access to information on nutrition, hygiene, and environmental sanitation; (iv) modify the risk structure faced by poor families reducing uncertainty in consumption and risks associated with catastrophic health events, and promote long-term investment in projects such as children’s education; (v) Encourage responsibility and active participation by all family members to improve their education, health, and nutrition; and, (vi) redistribute national income towards poor families.”⁵⁵

B. Operational Components:

In practice, these six objectives are implemented via Oportunidades’ three key components. The first component, an education intervention, is seen as a strategic factor in breaking the vicious cycle of poverty because it serves as the strong empirical link between human capital, productivity, and growth.⁵⁶ The education component can be broken down into

four channels: (i) a system of education grants; (ii) monetary support for the acquisition of school material; (iii) strengthening the supply and quality of education services; and, (iv) cultivation of parental responsibility for, and appreciation of the advantages stemming from, their children's education.⁵⁷ The focal point of this component is the education grant, which is intended to "enable children and young adults to complete basic education, promote enrollment, regular attendance, and parental participation in children's school performance."⁵⁸

When Oportunidades was originally implemented, children between third and ninth grade who are younger than age eighteen, were eligible to receive grants conditioned on their school attendance, as well as a transfer to purchase and replace school supplies.⁵⁹ In 2001/2002, students enrolled in high school under the age of twenty-two also become eligible for these conditioned grants and students who complete high school became eligible for an additional transfer in 2003.⁶⁰ Enrollment grants are paid every two months to mothers during the academic year (lasting 10 months) and are contingent on students attending at least 85% of classes in each preceding monthly period.⁶¹ Transfers increase according to grade levels, when the opportunity costs of not working rises, and are higher for girls beginning in secondary school (seventh grade) to counteract the fact that girls tend to leave school earlier.⁶²

Grants for school supplies also increase in secondary school. In primary school they are paid twice during the academic year, at the beginning of the school year (with proof of enrollment) and in February to replace supplies (with proof of continued attendance).⁶³ School supply transfers are paid in cash, unless the primary school is supported by CONAFE (Consejo Nacional de Fomento Educativo); in such a case the first grant is provided to the school, which provides the supplies directly to students.⁶⁴ All education grants help compensate households for the opportunity costs associated with sending children to school instead of to work where they

can earn much needed income.⁶⁵ Table 1 below illustrates the transfer plan as it applied to education transfers:

Table 1: Value of Transfers Per Child from July to December of 2002 (in 2002 pesos)⁶⁶			
<i>School Year:</i>	<i>Attendance:</i>		<i>Supply Transfer:</i>
<u>Primary School</u>			
Third Grade	100		200
Fourth Grade	115		200
Fifth Grade	150		200
Sixth Grade	200		200
<u>Secondary School</u>			
Seventh Grade	<i>Boys</i>	<i>Girls</i>	250
Eight Grade	290	310	250
Ninth Grade	310	340	250
	325	375	250
<u>High School</u>			
Tenth Grade	490	565	250
Eleventh Grade	525	600	250
Twelfth Grade	555	635	250

The second component, a health intervention, focuses on enhancing health and nutritional status of the household, especially mothers and children.⁶⁷ This component can be broken down into three elements put into practice via the Ministry of Health and IMSS-Solidaridad, a branch of the Mexican Social Security Institute:⁶⁸ (i) a basic package of services, including medicines provided free of charge; (ii) educational trainings on health, nutrition, and hygiene topics to promote self care by families and communities; and, (iii) strengthening the supply of health care services to meet additional demand.⁶⁹ In general, the idea is to afford basic health care for all family members by promoting a preventative approach and disseminating information.⁷⁰

A pre-emptive health care approach enables households to anticipate both the causes and presence of illness to decrease the incidence of it.⁷¹ This is why all family members are required to regularly visit health centers according to a schedule determined by their age and individual health risk characteristics.⁷² This timetable can be found in Table 2 on the following page.

Although Oportunidades focuses on preventative care, this does not ignore the need for curative methods required to control and eliminate the spread of disease.⁷³

Table 2: Schedule of Required Health Care Visits⁷⁴	
<i>Group:</i>	<i>Frequency:</i>
<u>Children</u>	
Younger than 4 months	Three yearly check-ups: at 7 & 28 days, as well as 2 months
4 months to 24 months	Eight yearly check-ups: at 4, 6, 9, 12, 15, 18, 21, & 24 months, as well as a monthly checkup for weight & height
2 to 4 years	Three yearly check-ups: one every 4 months
5-16 years	Two yearly check-ups: one every 6 months
<u>Women</u>	
Pregnant	Five check-ups: throughout the prenatal period
Nursing	Two check-ups: one during puerperium & lactation
<u>Adults & Youths</u>	
17 & over	One yearly check-up

Health education trainings are principally targeted at mothers, the primary household caretakers, though some topics require the entire household's attendance.⁷⁵ Monthly sessions cover approximately 35 subjects (as illustrated in Table 3 on the following page) and promote changes in attitudes and habits.⁷⁶ An emphasis is placed on ways to prevent and reduce health risks, how to recognize signs or symptoms of sickness, and how to follow appropriate primary care procedures; these topics and other important health education messages are followed up on with patients during check-ups.⁷⁷ Recordings of health talks are aired on the radio for the general population and videos in native tongues are available for indigenous households.⁷⁸

Oportunidades also provides funds to bolster the supply of health services available to patients at public sector institutions. They ensure adequate supply of equipment, encourage top quality staff to work in remote areas for extended periods, provide necessary medicines or education materials as needed, and offer additional staff trainings to improve the quality of medical attention and operation of services.⁷⁹ These resources are vital to the efficiency and effectiveness of health services, as well as meeting additional demand created by the program.⁸⁰

1. Food supplements	19. Parasites
2. Food & health	20. Acute respiratory infections
3. Basic hygiene*	21. Pulmonary tuberculosis
4. Social participation	22. Hypertension & diabetes*
5. Adolescence & Sexuality**	23. Accident prevention*
6. Family planning**	24. Management of injuries
7. Motherhood & risk	25. Dental health
8. Pregnancy	26. Vector-borne illness*
9. Nutrition during pregnancy & lactation	27. Addictions**
10. Birth & the post-partum period	28. Sexually transmitted diseases**
11. The newborn	29. HIV/AIDS**
12. Breast-feeding	30. Gender equity**
13. Breast & cervical cancer	31. Family dysfunction & domestic
14. Infants under one year	32. Pre-menopause & menopause
15. Toddlers over one year	33. Basic disaster readiness*
16. Vaccinations	34. Caring for the elderly*
17. Diarrhea	35. Disabilities
18. Oral rehydration	

Notes:

- i) One asterisk (*) indicates that high school students receiving education grants must attend these talks as of 2001 in order to receive education grants.
- ii) Two asterisks (**) indicate that male parents are also asked to attend these talks, though their attendance has no effect on receipt of benefits.

The final component, a nutrition intervention, places a spotlight on the prevention of malnutrition in infants and small children, as well as pregnant and nursing mothers, which is particularly detrimental to the future cognitive and physical development of children.⁸² It offers two different benefits: (i) in kind nutritional supplements and (ii) a cash transfer intended to improve the nutrition level of privately purchased food.⁸³ This component provides “subsidies to improve food consumption and the nutritional status of vulnerable family members.”⁸⁴

Nutrition supplements are provided year round at no cost to children between the ages of four months and two years (they are not provided earlier to encourage breast feeding to infants), to children between the ages of two and four who are malnourished, and to pregnant or nursing mothers.⁸⁵ Supplements are granted at check-ups to mothers who are informed of their child’s

nutritional status and how to correctly administer the supplements.⁸⁶ They aim to minimize inequalities in intra-household food allocation and right micronutrient deficiencies.⁸⁷

Table 4: Nutritional Content of Supplements⁸⁸		
<i>Nutrient:</i>	<i>Children:</i>	<i>Pregnant & Nursing Mothers:</i>
Protein	5.8g	120g
Energy	194 kcal	250kcal
Fat	6.6g	11.2g
Carbohydrates	27.9g	25.3g
Sodium	24.5 mg	81.2mg
Iron	10mg	15mg
Zinc	10mg	15mg
Iodine	0mg	100mg
Vitamin A	400 mg	0mg
Vitamin B	6 mg	10mg
Vitamin B12	40 mg	70mg
Vitamin C	0.7	2.6mg
Folic Acid	50mg	100mg

As shown in table 4 above, two types of supplements, which are customized for children and mothers, supply 100% of daily micronutrient needs and approximately 20% of required daily calories.⁸⁹ Lastly, households can also obtain a cash transfer for food at a value of 150 pesos per month (in 2002 pesos).⁹⁰ This benefit is specifically conditioned on the attendance of all family members at mandatory check-ups as well as the mother's presence at monthly health talks discussed earlier.⁹¹ It, like all others, is disbursed only to mothers because they are generally the individual responsible for making shopping choices, cooking food, and looking after children's health and education; though this is not always the case.⁹²

C. Values, Costs, Coverage, & Progress:

The maximum monthly value of transfers that households can receive for education and food grants is capped at a value of 750 pesos (in 2002 pesos) to avoid a situation where beneficiaries may become dependent on public assistance; reducing a family's incentives to improve income and living conditions would be counterproductive in the long run.⁹³

Consequently, Oportunidades' is designed so that the total value of monetary transfers fluctuates along with a households' life cycle.⁹⁴ In addition, most of the money families receive from Oportunidades comes in the form of education grants tied to children's school attendance (instead of food transfers), which are phased out over time (as students progress) in order not to encourage large families.⁹⁵ Lastly, households are entitled to participate in the program for three years, at which time they must go through a process of re-certification, if they wish to continue for three more.⁹⁶ Interestingly, the nominal values of all transfers (education and food) are indexed to the National Consumer Price Index (which reflects the cost of living) and adjusted every six months to ensure that the real value of the grants is maintained.⁹⁷

In the end, Oportunidades' cash transfers amount to an average boost in income of around 22% for beneficiary families.⁹⁸ A typical beneficiary family receives 342 pesos (in 2002 values) per month, which is a significant amount when one considers that average monthly minimum was 1,192 pesos (in 2002 pesos) per month at that time.⁹⁹ Prior to Oportunidades, the average monthly minimum wage was 1,760 (in 2002 pesos); meaning that the program's transfers represented an increase in disposable income of just over 19%.¹⁰⁰ There is a great deal of variation in how much a family receives, depending on its characteristics and record of meeting conditionalities. Nonetheless, this is a sizable sum of money for poor families that should have an immediate and independent impact on poverty reduction in the short run (in addition to education, health, and nutrition outcomes over time).

Oportunidades is a distinctive program not only because of its hybrid strategy, but also because it is extremely cost effective. Though program expenditures have risen substantially, from 240 million to 2.7 billion pesos due to expansion of the program, operating expenses have stabilized at around 6% of the budget.¹⁰¹ In other words, 94 centavos out of every peso spent on

Oportunidades reaches households; 82 of those centavos represent direct cash transfers and the remaining 12 centavos represent in kind subsidies, such as nutritional supplements.¹⁰² A great deal of this can be attributed to that fact that unlike other demand side interventions in Mexico, it provides cash instead of food transfers – the latter of which have been proven to be by costly subsidies with very high levels of benefit leakages to non-poor households.¹⁰³ Grosh (1994) highlights the cost effectiveness of Oportunidades by comparing it to other programs in Mexico, such as Leche Industrial CONASUPO (LICONSA), that run program costs as high as 40 centavos per peso (or 40% of its budget).¹⁰⁴ As such, the amplification in the size of Oportunidades' spending appears legitimate due to the swell in the number of beneficiaries from thousands to millions of families.

The size of Oportunidades could foreshadow inefficient targeting and coverage, which has historically been common for other massive programs. Nonetheless, this has not necessarily proven to be the case. Some leakage from the program certainly exists; however, it appears as though the vast majority of Oportunidades' beneficiaries are those who fall under the poverty line. This is illustrated by the fact that as of 2003 74% of families in highly marginalized communities were covered by the program, while this was only the case with 31% of families in moderately marginalized communities, and fewer than 5% in communities with low levels of marginalization.¹⁰⁵

Moreover, its coverage is higher in smaller communities, which are often poorer and more marginalized.¹⁰⁶ For instance, Oportunidades serves 94% of families in communities with high to very high levels of marginalization and more than 100 inhabitants. That being said, it only serves 53% of those same poor families located in communities with less than 100

individuals.¹⁰⁷ Thus, it becomes evident that although Oportunidades' targeting and coverage is admirable, it has plenty of room for improvement, if it hopes to reach those who need it the most.

In order to ensure that Oportunidades has a lasting impact beyond the short to medium term, the program has taken a number of steps to improve itself. Aforementioned elements of its progression over time include changes to the education grant structure, the sizable expansion of its coverage, and the stabilization of its low costs. In 2001 a rather substantial increase in the program's coverage and budget, along the programming modifications referred to earlier, accompanied the program's change of name to Oportunidades. One additional and interesting factor of Oportunidades' progress over time has been the program's ability to remain non-partisan and out of the political arena, despite numerous heated elections.¹⁰⁸ Sadly, this should be measured an accomplishment considering the precedent for political manipulation and capture of social programs in the developing world (especially in Mexico).¹⁰⁹

D. Impacts:

Thanks to the experimental design of the Oportunidades, a plethora of impact evaluations have been conducted assessing the programs outcomes. Some of the most rigorous work has been conducted by the International Food Policy Research Institute (IFPRI), the Mexican National Institute of Public Health (INSP), and the Mexican Center for Research and Advanced Studies in Social Anthropology. The vast majority of the available empirical literature has assessed the program's impacts in rural areas over the short term and has found positive outcomes in education, health, nutrition, and consumption, despite some operational setbacks.¹¹⁰

For example, Shultz finds that enrollment rates for children in the program who have completed sixth grade (and should move on to seventh grade – most of which are twelve years old) improved 9.4% – 12.6% for females and 7.3% for males.¹¹¹ This is a promising finding

because the transition from primary to secondary school has been proven to be the starting point for when most children leave school.¹¹² Not surprisingly, increases in enrollment in conjunction with Oportunidades have been highly related to significant reductions in children's labor market participation.¹¹³ Though positive education impacts are found for other periods of schooling, the most pronounced findings hover around the transition to seventh grade and during secondary school because of how high enrollment rates are in primary schools. Consequently, Behrman, Sengupta, and Todd find that twelve year old children eligible to move on to secondary school are 6% less likely to repeat seventh grade and progress through school 11% faster as a result of Oportunidades.¹¹⁴ In addition, Parker finds that 14% of boys and 17.9% of girls who have previously dropped out of or failed third grade are more likely to stay in school as a result of the program.¹¹⁵

Oportunidades' impact on health and nutrition has also proven robust across numerous indicators. For example, Gertler finds that children between the ages of zero and five in the program exhibit 12% lower incidence rates of illness.¹¹⁶ Likewise, Gertler finds that young children in the program are nearly one centimeter taller than control children (those with similar characteristics in non-participating households) and 25.5% less likely to be anemic.¹¹⁷ When it comes to adult health, Gertler finds that beneficiaries spend 17% fewer days incapacitated, 22% fewer days in bed, and walk about 7% farther.¹¹⁸ Some of this can be attributed to the encouraging result that the demand for health services increased by 30 to 50%, depending on age groups, in response to the free health care options provided by Oportunidades.¹¹⁹ Lastly, Hernandez and Huerta conclude that the number of program beneficiaries engaged in prenatal care rose nearly 5% (from 84.1 to 88.9%), illustrating Oportunidades' positive influence on pregnant mothers.¹²⁰

In terms of consumption, Oportunidades also appears to have had a substantial and positive effect on beneficiary households. For instance, Hoddinott, Skoufias, and Washburn, find that average level of consumption increased nearly 15% for beneficiary households.¹²¹ It is particularly encouraging that in November 1999, over 10% of this increase was spent on food expenditures, which translated into a 7.1% increase in caloric acquisition for participants.¹²² Most of these additional purchases have come in the form of vegetables and animal purchases, signifying an overall improvement in dietary quality for beneficiaries.¹²³

Though assessing Oportunidades' impact on poverty is difficult, numerous estimates convey that the program has improved the general welfare of its beneficiaries. For example, the headcount poverty rate from November 1997 to November 1999 (measured according to median consumption as a proxy for income) fell by 17%.¹²⁴ Moreover, the poverty gap and severity of poverty declined 36% and 46%, respectively, for participants during the same period.¹²⁵ This, coupled with the finding that the additional education attained by children should translate into an 8% future increase in annual earnings, highlights Oportunidades' fairly robust results.¹²⁶

Though not all of program's interventions have been as effective as those mentioned above, they have for the most part contributed to the accumulation of human capital and improvement of welfare for Mexico's poorest groups. Only time will tell if these outcomes will be sustained, strides will be made according to additional measures, and Oportunidades will contribute to breaking the vicious cycle of poverty in the long run. Although Oportunidades has not yet achieved its goals, it has begun the process of "creating conditions where families would have more security regarding the availability of income to buy food; more information on hygiene, environmental and reproductive health; alternative sources of income for present

consumptions to enable their children to attend school more regularly and for longer periods of time; and a modified structure of health risks...”¹²⁷

3. Conceptual Framework:

A. Human Capital Theory & Conditionality Underpinnings:¹²⁸

The human capital framework, which became quite prominent in the early 1960s, attempts to explain why people’s incomes differ based on their training, amongst other factors like basic health.¹²⁹ It has been rigorously tested in over 60 countries and is based on the idea that “if someone has more years of schooling, he or she will receive higher rewards later in life relative to a lesser trained person as compensation for past investment in human capital.”¹³⁰ In the mid 1970’s Jacob Mincer’s landmark investigation, *Schooling, Experience, and Earnings*, solidified the relationship between earnings, education, and labor market experience in the U.S.A.¹³¹ This link is one of the key reasons why some programs in developing countries target increases in education or basic health as a means to alleviate future poverty.

Human capital theory also asserts that in most instances education is obtained at a private cost by families to increase a student’s future productivity, in addition to public costs.¹³² Moreover, the decision to remain in school is “affected by the balance between the current opportunity cost of enrollment and the anticipated future productive gains from acquiring additional schooling.”¹³³ Many policies formulated to boost education or health for the poor focus on improving access to quality public schools and health clinics.¹³⁴ This increases the anticipated future productive gains from schooling, which helps education overcome the relatively high opportunity costs (shadow prices) of current enrollment. However, many of these policies have ignored that such measures also necessitate complimentary private investments by

the household and a basic level of health. To overcome this issue, programs such as Oportunidades transfer public resources directly to families (once they meet co-responsibilities) who then chose how to invest in their children's health and schooling as needed.¹³⁵

These in-kind transfers are purposely conditioned on regular school attendance and periodic medical visits that provide incentives for households to make additional private investments to increase human capital accumulation. Empirical analyses of unconditional cash transfer programs have found their positive impacts on education to be marginal at best.¹³⁶ On the other hand, studies have found that conditional transfers are associated with greater improvements in children's welfare than unconditioned cash grants.¹³⁷ This implies that unconditional income transfer programs can only have a limited effect in increasing human capital due to the nature of their design.¹³⁸ In addition, there is evidence that conditioned cash transfer programs may be more effective in lowering the shadow price of attending school, increasing complimentary household investment, fostering basic health, and improving school enrollment rates.¹³⁹

However, these findings are in contrast to basic economic theory, which proposes that a household would be better off receiving unconditioned benefits.¹⁴⁰ This theoretical perspective assumes that markets are fully functioning and fails to consider that household behavior deviates significantly in the presence of markets failures. The trend for households in rural economies affected by incomplete markets and externalities is to invest less in education and health than what would be socially optimal; conditionalities serve as a mechanism to bridge this gap and improve efficiency.¹⁴¹ In other words, requiring households to meet a minimum of school attendance and health visit co-responsibilities results in improved human capital accumulation for the poor and greater social welfare for society as a whole.¹⁴² Thus, it becomes apparent that

Oportunidades' unique synthesis of conditional cash transfers are justified on the basis that they lead to greater human capital accumulation for the poor, overcome obstacles created by imperfect markets, and maximize social welfare gains.

B. Underpinnings, Justifications & a Hypothesis:

By now it is apparent that if effective, Oportunidades should have a significant impact on Mexico's marginalized indigenous populations. After all, their education levels are quite low: in 2002, 28% of children between the ages of six and fourteen living in primarily indigenous municipalities did not enroll in school and 32.5% of individuals older than fifteen years old did not know how to read and write according to the Mexican Instituto Nacional Indigenista.¹⁴³ In addition, indigenous children are more likely to be overworked, exploited, and deprivation of their health as a consequence.¹⁴⁴ However, whether or not Oportunidades' impact will be the same, lesser, or stronger on indigenous populations versus the general population (or the non-indigenous group) is an unresolved question. That being said, there are numerous specific reasons why one might expect Oportunidades' impact on indigenous populations to differ.

For starters, it is possible that they will benefit more because they are starting off at a lower point of human capital accumulation and so their increase will be extraordinarily accelerated by Oportunidades. On the other hand, it can be argued that the program is not adequately designed to specifically meet indigenous people's unique needs. For instance, the cash transfers may not be sufficient to overcome the opportunity costs of sending an indigenous child to school or a clinic who is counted on to generate income with that time. This is a major concern because indigenous parents have less formal schooling, lower earnings, and many of them rely on agricultural work, which is intensive and necessitates family labor.¹⁴⁵ Not

surprisingly, households who work in agriculture have children with lower levels of human capital attainment.”¹⁴⁶

Further, indigenous populations are disproportionately concentrated in very rural areas of Mexico.¹⁴⁷ This is a disadvantage to them because rural public schools and clinics often have fewer and lower quality institutional resources.¹⁴⁸ Thus, the incentives for indigenous children to go to school or visit a doctor in very rural municipalities are diminished. In addition, rural children face substantial logistical obstacles, such as having to travel up to three to four hours to and from larger towns where schools or health centers are located.¹⁴⁹ Even if poor rural indigenous children do enroll in school it should also be noted that they are more likely to be taken out of school during times of need to work.¹⁵⁰ This issue intensifies as a child ages because a households’ dependence on child income increases with age; worse yet, indigenous children account for even larger portions of total family incomes.¹⁵¹ In addition, it should be highlighted that child labor forces are generally much greater in indigenous areas of Mexico.¹⁵²

Another issue that contributes to this problem, and the stunting of human capital accumulation, is the fact that indigenous children have a higher likelihood of being employed and out of school because of language problems and cultural differences.¹⁵³ This may also pose disincentives to visit health clinics where staff can not effectively communicate with indigenous families, indigenous patients feel uncomfortable, and the quality of care or information dissemination suffers greatly. Language complications are especially pertinent to the case of the indigenous poor in Mexico because they speak so many different languages that it is difficult for them to unify themselves with each other as a cohesive group (or the non-indigenous population) and overcome barriers, such as discrimination.¹⁵⁴ This issue of discrimination should not be

underestimated; it undoubtedly plays an influential role in why indigenous populations continue to be marginalized.¹⁵⁵

Thus, it becomes apparent that there are numerous reasons for why the impact of Oportunidades may differ on indigenous people. Certainly, others such as family size exist, but only the most prominent are discussed here in the interests of brevity. It is for the abovementioned reasons that this study tests *the hypothesis that the impact of Oportunidades on human capital (measured by school enrollment, progression, repeat and illness rates) will differ between the general beneficiary population and indigenous beneficiary population in Mexico.* Whether this divergence will be positive or negative is hard to say. The former is hoped for, but it is also obvious that the latter may be extremely likely considering the added challenges that the rural indigenous poor of Mexico continue to grapple with.

4. Data:

A. General Description:

The data used in this analysis is a panel that was constructed from five surveys starting in November of 1997 and ending in May of 2000. It is particularly rich data because of its substantial concentration of observations in the lowest tail of the income distribution where indigenous populations largely reside. Thus, it will hopefully provide for fruitful analyses of indigenous and impoverished households. The first survey is a Mexican household economic census (ENCASEH) from November 1997 that serves as the baseline for assessing Oportunidades. It is primarily used to provide individual and household characteristics, as well as starting points for enrollment, repeat, and progression rates. The second is an Oportunidades baseline follow up survey from March 1998 which provides the earliest information about illness

rates. The third is a household evaluation survey (ENCEL) from October 1998 that provides community level information, such as the presence of schools in a locality, as well as data concerning enrollment, repeat, and progression rates.

The fourth survey is an ENCEL from November 1999, conducted nearly two years after the program was initiated, which supplies data about enrollment, repeat, and progression outcomes. Lastly, an ENCEL from May 2000 is employed to provide information about illness outcomes. In total, the merged data provide observations for approximately 110,000 individuals from 320 treatment and 186 control communities. Whether or not a household has been treated is represented by a dummy variable named Participation (control = 0 and treatment = 1).

These data sets are merged to create two samples: one of children between the ages of eight and fifteen in 1997 and 1999 (to test enrollment, progression, and repeat outcomes), as well as one of children between the ages of zero and five in 1998 and 2000 (to test illness outcomes). The first data set is limited to the ages when most children are in grades three through nine, which are the grades Oportunidades originally offered transfers for, and yields roughly 48,000 observations. For the purposes of comparison, this education sample is broken down into two smaller sub-samples: one with children between the ages of twelve to fourteen (the age range when students generally transition into secondary school) and another restricted only to twelve year olds (the age when the greatest number of students transition). The second data set concentrates on younger children, when illnesses have the most serious long term consequences, and yields approximately 13,000 observations. For the purposes of comparison, this illness set is broken down into two smaller sub-samples: children between zero and two years old versus children between three and five years old.

This collection of observations is used to assess how enrollment, repeat, progression, and illness rates have changed for beneficiaries as a result of Oportunidades, as well as how these results differ for Mexico's indigenous poor. Enrollment, the dependent variable in the first test, is a nominal measure (no = 0 and yes = 1) representing whether or not survey respondents claim to currently be attending school.¹⁵⁶ Progression, the dependent variable in the third test, is a nominal measure defined as currently being in a grade above last year's. Repeat, the dependent measure in the second test, is a nominal variable defined as currently being in the same grade as the previous year. For progression and repeat tests, though not for enrollment regression, observations are dropped if a child skips more than three grades or goes backwards in grade level.¹⁵⁷ Illness, the dependent variable, is a nominal measure indicating a mother's response to whether her (five years old or younger) child has been sick in the last four weeks.

Individuals are identified as being indigenous in two ways for the purpose of comparison when initial tests are robust. The primary set of regressions identifies indigenous children based on whether or not their head of household speaks an indigenous language (Head Indigenous Language or Indigenous 1).¹⁵⁸ Surveys obtain this information by directly asking the head of household if he or she speaks an indigenous language.¹⁵⁹ A second more rigorous indigenous measure (used in this study when initial tests are statistically robust) is based on the first variable detailed above, but excludes heads of households who are bilingual. In other words, it identifies individuals who do not speak Spanish or any other additional language (Head Only Indigenous Language or Indigenous 2). This measure may prove helpful in assessing the impact of Oportunidades on less integrated indigenous populations.

Additional explanatory variables, such as Household Size, Owns Cattle, Education Committee, are described in the following section. If Indigenous 1 and Indigenous 2 test results

are statistically significant, logical, and consistent with previous studies, the heterogeneity of these impacts is further broken down for Indigenous 1 according to two separate specifications. Firstly, outcomes are taken into the gender (female = 0 and male =1) of respondents for reasons that will be described below. Secondly, results are broken down for respondents who reside in the states of Michoacan, Guerrero, and Veracruz for reasons that will be detailed later. This format allows for a more comprehensive view of Oportunidades' indigenous heterogeneity.

B. Control & Treatment Characteristics:

Before running any regressions, it is important to statistically compare the means of the control and treatment groups to understand how each group generally sizes up and to identify observable (significant) differences between the two that need to be controlled. In this case, three samples are considered to compare the characteristics of control and treatment groups: (i) a general sample of children zero to fifteen (which is an approximate baseline combination of the education and health samples), (ii) a sample of children eight to fifteen for three education factors, and (iii) a sample of children zero to five for one health factor. This format is repeated in the next section to contrast indigenous and non-indigenous populations.

The zero to fifteen sample yields approximately 32,000 observations: around 12,000 control and 20,000 treatment observations. The eight to fifteen sample yields roughly 23,000 observations: about 9,000 control and 14,000 observations. The zero to five sample yields approximately 7,000 observations: around 2,000 control and 4,000 observations. Table 5, found on the following page, demonstrates the results of numerous t-tests and illustrates the variety of similarities and significant differences between the groups.

Table 5: Treatment & Control Group Means at 1997 Baseline

<i>Variables</i>	<i>Control (C₀)</i>	<i>Treatment (T₀)</i>	<i>C₀-T₀</i>	<i>Significance</i>
<i>Ages 0 to 15 Observations:</i>	12527	19656		
<u>Household Data</u>				
Household Size	7.273	7.223	0.050	***
Age	9.880	9.812	0.068	***
Males	0.509	0.523	-0.014	***
Head Years of Education	2.815	2.865	-0.050	**
Head Literacy	0.731	0.734	-0.003	
Head Indigenous Language	0.343	0.362	-0.019	****
Head Bilingual	0.311	0.328	-0.017	****
Head Only Indigenous Language	0.032	0.034	-0.002	
Head Non-Agricultural Labor	0.263	0.284	-0.021	****
Labor	3.287	3.233	0.054	****
Male Labor	1.653	1.635	0.018	*
Owns Automobile	0.023	0.022	0.001	
Owns Truck	0.085	0.069	-0.016	****
Owns Home	0.951	0.959	-0.008	****
Owns Home Lot	0.890	0.911	-0.021	****
Land Used/Owned	2.339	2.261	0.079	*
Owns Cattle	1.131	1.064	0.067	*
Electricity	0.770	0.728	0.042	****
Tubed Water	0.330	0.403	-0.023	****
Earth-floor	0.600	0.605	-0.005	
Youth Literacy	0.743	0.732	0.011	***
Youth Indigenous Language	0.290	0.293	-0.003	
Youth Bilingual	0.230	0.249	-0.019	****
Youth Non Agricultural Work	0.549	0.630	-0.081	****
Youth Annual Work	0.585	0.535	0.050	****
<u>Community Data</u>				
Marginalization Index	0.469	0.434	0.035	****
Up to 25% Poor Households	0.071	0.097	-0.026	****
26% to 50% Poor Households	0.486	0.351	0.135	****
51% to 75% Poor Households	0.293	0.376	-0.083	****
75% to 100% Poor Households	0.150	0.176	-0.026	****
Education Committee	0.784	0.791	-0.007	
Pre-school	0.826	0.840	-0.014	****
Primary School	0.961	0.946	0.069	****
Secondary School	0.010	0.011	-0.001	
<i>Ages 8 to 15 Observations:</i>	8972	14025		
<u>Education Data</u>				
Enrollment Rate	0.783	0.821	-0.038	****
Repeat Rate	0.144	0.154	-0.010	***
Progression Rate	0.636	0.663	-0.027	****
<i>Ages 0 to 5 Observations:</i>	2460	3923		

<u>Health Data</u>				
Illness Rate	0.341	0.342	-0.001	

Notes:

i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.

Although, the magnitudes of these variations are not extremely large in nearly all instances, many prove to be statistically significant above a 95% or 99% level. Thus, it becomes apparent that despite the randomized design of Oportunidades (which is detailed in the following section), a great deal of statistically powerful differences still exist between control and treatment groups, no matter how subtle they may seem at first. For instance, household size and labor are actually larger in the control group, which is also slightly older; however, there are more males in the treatment group. All of these results vary in a highly significant manner. A head of household's years of education, often a strong indicator of children's education levels, is statistically significant above the 90% level, unlike a head of household's literacy or whether he or she only speaks an indigenous language. There are also extremely significant differences between each group in regards to head of households who speak an indigenous language, are bilingual, or participate in non-agricultural labor. Male labor and ownership of an automobile do not vary much, but ownership of a truck, home, and home lot do in a significant manner. The amount of land owned/used, cattle owned, and whether a household has an earth-floor do not differ significantly, but access to electricity and tubed water do.¹⁶⁰ Thus, it becomes evident that household characteristics and asset levels will need to be controlled for; otherwise they may drive the results to under or overestimate the effects of Oportunidades.

For youths, highly significant differences between both groups can be found regarding school enrolment, repeat, and progression rates, as well as literacy, being bilingual, or engaging in non-agricultural work and annual work. On the other hand, speaking an indigenous language

or the incidence of illness do not pose discrepancies to be concerned about. In terms of community characteristics, one also finds a multitude of observable statistically significant variations to account for. For instance, the control group averaged a significantly higher marginalization index score than the treatment group. Moreover, the percentage of poor households in a community, as well as whether a locality has a pre-school or primary school, is quite significantly different. On the other hand, whether a community has an education committee (a crude measure of social capital) or a secondary school does not vary much across groups. In the end, it is apparent that simply comparing control and treatment groups without controlling for their inherent differences would be imprudent and bias the program's results.

C. Indigenous & Non-Indigenous Characteristics:

It is also imperative to examine the characteristics of indigenous and non-indigenous households because they too could bias regression estimates. Table 6 on the following page illustrates a somewhat analogous situation to the previous one, although in this instance there is more statistical divergence between the groups. The zero to fifteen sample yields roughly 21,000 non-indigenous and 11,000 indigenous observations (according to Indigenous 1). The eight to fifteen sample yields approximately 15,000 non-indigenous and 3,000 indigenous observations. The zero to five sample yields around 4,000 non-indigenous and 2,000 indigenous observations. To start, it is apparent that participation in Oportunidades is significantly greater for the indigenous group at a 99% significance level. This may be because there are more poor indigenous communities or indigenous take-up rates are higher, as well as because of administrative targeting and implementation issues.

Table 6: Indigenous & Non-Indigenous Group Means at 1997 Baseline

<i>Variables</i>	<i>Non-Indigenous (I₀)</i>	<i>Indigenous (I₁)</i>	<i>I₀-I₁</i>	<i>Significance</i>
<i>Ages 0 to 15 Observations:</i>	20764	11419		
<u>Household Data</u>				
Participation in Oportunidades	0.604	0.623	-0.019	****
Household Size	7.267	7.198	0.069	****
Age	9.907	9.716	0.191	****
Males	0.513	0.526	-0.013	***
Head Years of Education	2.815	2.901	-0.086	****
Head Literacy	0.766	0.674	0.092	****
Head Bilingual	0.000	0.906	-0.906	****
Head Only Indigenous Language	0.000	0.094	-0.094	****
Head Non-Agricultural Labor	0.289	0.251	0.038	****
Labor	3.300	3.171	0.129	****
Male Labor	1.670	1.591	0.079	****
Owns Automobile	0.032	0.007	0.025	****
Owns Truck	0.103	0.026	0.077	***
Owns Home	0.945	0.975	-0.030	****
Owns Home Lot	0.890	0.926	-0.036	****
Land Used/Owned	2.368	2.152	0.214	****
Owns Cattle	1.366	0.589	0.777	****
Electricity	0.799	0.646	0.153	****
Tubed Water	0.454	0.230	0.224	****
Earth-floor	0.503	0.783	-0.280	****
Youth Literacy	0.758	0.696	0.062	****
Youth Indigenous Language	0.002	0.817	-0.815	****
Youth Bilingual	0.002	0.676	-0.674	****
Youth Non-Agricultural Work	0.642	0.510	0.132	****
Youth Annual Work	0.553	0.550	0.003	
<u>Community Data</u>				
Marginalization Index	0.186	0.923	-0.736	****
Up to 25% Poor Households	0.106	0.052	0.054	****
26% to 50% Poor Households	0.535	0.165	0.370	****
51% to 75% Poor Households	0.282	0.455	-0.173	****
75% to 100% Poor Households	0.077	0.328	-0.251	****
Education Committee	0.780	0.803	-0.023	****
Preschool	0.829	0.845	-0.016	****
Primary School	0.960	0.935	0.025	****
Secondary School	0.009	0.012	-0.003	***
<i>Ages 8 to 15 Observations:</i>	15004	7993		
<u>Education Data</u>				
Enrollment Rate	0.859	0.884	-0.025	****
Repeat Rate	0.217	0.254	-0.037	****
Progression Rate	0.641	0.628	0.013	**
<i>Ages 0 to 5 Observations:</i>	4017	2366		

<u>Health Data</u>				
Illness Rate	0.343	0.341	0.001	

Notes:

i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.

Household size is still statistically significant, although indigenous households are now smaller. The discrepancies in household size, age, and males are also quite statistically significant. Furthermore, variations in reference to a head of household's years of education, literacy, bilingualism, and non-agricultural employment are significantly different above a 99% level. It is particularly interesting that the indigenous group exhibits a higher mean head of household's years of education than the non-indigenous group. This is contrary to the theory provided earlier, but may be due to the fact that both populations are so poor that the typically wide indigenous education and poverty gap may not hold true. The remaining labor characteristics are also extremely significant and do not pose any particular surprises, though they too will need to be accounted for.

Moving on to the variables that deal with ownership, capital accumulation, and access to services, one finds that almost all of them are significantly different at a 99% level. The non-indigenous population is more likely to own an automobile, truck, land, and cattle, or have electricity and tubed water in their home. It is noteworthy that the non-indigenous households, on average, own almost one more cow than the non-indigenous households. On the other hand, households in the indigenous group are more likely to own their home and home lot or have a dirt earth-floor. This pattern can be partially explained because indigenous households typically live in more rural areas that lack access to credit and mechanized transportation. As a result, they are often more attached to their family dwellings, land or traditional (distinct) culture;

though, this is certainly only part of the story. Either way these discrepancies will need to be controlled for.

In terms of youth variables it is apparent that significant differences exist between both groups in relation to literacy, languages, and non-agricultural work, but not annual work. enrollment rates are about 3% higher for the indigenous group, however, progression and repeat rates are all lower for the indigenous group and significant above a 90% level. On the other hand, illness is once again consistently similar across the board. This may simply illustrate that indigenous households find sending their children to school more appealing, if they can bear costs, because they have few other options of providing valuable future opportunities for their children.

Indigenous communities come out to be enormously and significantly more marginalized than non-indigenous localities. In fact, indigenous households live in localities that are nearly five times as marginalized as those where non-indigenous households reside. This is supported by the finding that non-indigenous communities generally have fewer poor households; they are highly concentrated in communities made up of 0 to 50% poor households, while indigenous households are decidedly concentrated in localities consisting of 51 to 100% poor households. All of these comparisons are significant, which reinforces the view that the indigenous group appears to be much more impoverished. Lastly, education committees, pre-schools, and secondary schools appear more likely in indigenous areas, while primary schools are less common.

In the end, the two abovementioned comparisons make it clear that a wide variety of observable factors must be accounted for when assessing Oportunidades' impact on indigenous populations; otherwise this analysis will be inherently skewed. The exact list of variables

included in regressions as control variables is detailed in the following section. Table 5 demonstrated the statistical differences between control and treatment groups. In addition, Table 6 is of particular interest because it illustrated that the indigenous are more disadvantaged in a multitude of ways, though this does not unilaterally hold true. This outcome is quite possibly explained by the concentration of this data amongst the poorest of the poor. Consequently, some differences between highly disadvantaged populations, indigenous or non-indigenous, likely melt away as the challenges associated with abject poverty become overwhelming.

5. Empirical Methodology:¹⁶¹

The random design of this program and the panel form of this data are two features that facilitate impact assessments by minimizing numerous econometric pitfalls and statistical concerns. Oportunidades intentionally adhered to an experimental design from its inception, which allows for the comparison of impacts between treatment and control groups.¹⁶² This is possible because the program was randomly implemented in a limited number of eligible communities due to budgetary constraints.¹⁶³ As a result, eligible communities awaiting inclusion into Oportunidades serve as a control group up until the point when they are incorporated in the following years. Furthermore, this data set contains repeated observations for the same control and treatment households before and after the program was implemented.¹⁶⁴ For example, a sample of 24,000 families from 506 communities was regularly interviewed between 1997 and 1999 in the seven states where Oportunidades was initially launched.¹⁶⁵ Each time the program has expanded, it has made efforts to maintain its experimental design and repeatedly survey consistent (or extremely similar) samples of the population to facilitate future impact assessments.

As a result, it is possible to straightforwardly estimate program effects via a difference-in-difference or double difference method.¹⁶⁶ This approach is then extended one step to highlight Oportunidades' impact on indigenous populations. In essence, these differentiated results are estimated via a triple difference approach. The double difference approach provides the average program impact by taking into account the differences across time and across control and treatment groups. In theory, the double difference approach controls for the effects of observed differences between groups over time and all time invariant unobserved characteristics. This method is illustrated in Table 7 and its estimation equation found below:

Table 7: Double Difference Approach			
	<i>Treatment Group (T)</i>	<i>Control Group (T)</i>	<i>Difference Across Groups</i>
Follow Up (1 = 1999)	T1	C1	T1-T0
Baseline (0 = 1997)	T0	C0	C1-C0
Difference Across Time	T1 – T0	C1 – C0	(T1-T0)-(C1-C0)

$$(1) Eict = \alpha_0 + \alpha_1 Yt + \alpha_2 Pc + \delta_1 Yt Pc + (\mu_i + v_{ict}),$$

Eict is the outcome variable (enrollment, progression, repeat, or illness rates in this case), *Yt* represents time, *Pc* represents participation in Oportunidades, *Yt Pc* represents the interaction between participation in the program and time, $(\mu_i + v_{ict})$ represents controls for observed and unobserved household time invariant factors and time variant errors (respectively), α 's represent unknown parameters, and δ_1 represents the double difference impact. Next is the augmented triple difference equation (differentiated by indigenusness):

$$(2) Eict = \alpha_0 + \alpha_1 Yt + \alpha_2 Kc + \alpha_3 Pc + \alpha_4 Yt Kc + \alpha_5 Kc Pc + \delta_2 Yt Pc + \delta_3 Yt Pc Kc + (\mu_c + \mu_i + v_{ict})$$

The equation above follows the same form, but adds in *Kc* to represent being indigenous, $\alpha_4 Yt Kc$ represents the interaction between time and being indigenous, $\alpha_5 Kc Pc$ represents the interaction between being indigenous and participating in Oportunidades, *Yt Pc Kc* represents the interaction between time, participation in the program, and being indigenous, $(\mu_c + \mu_i + v_{ict})$

represents controls for observed and unobserved household and indigenous time invariant factors, as well as time variant errors (respectively), and finally δ_3 represents the triple difference indigenous effect. Thus, the total estimated program effect for indigenous people is $\delta_2 + \delta_3$ from the second equation.

To be clear, $(\mu_c + \mu_i + \nu_{ict})$ are the controls identified in the previous section that account for the statistically significant time variant and invariant differences between control and treatment groups, as well as indigenous and non-indigenous groups. In other words, the following is a list of variables included to control for observable differences: Household Size, Age, Male (gender), Head Years of Education, Total Land Used/Owned, Owns Cattle, Electricity, Earth-floor, Marginalization Index, Education Committee, Secondary School, and state dummy variables.¹⁶⁷ They are all included because they were significantly different in one of the aforementioned comparisons, varied in both, or measure (directly or as a proxy) an important asset (or category) that could influence the dependent variable. Youth human capital indicators are not incorporated because they are a function of human capital accumulation in the first place. Similarly, youth work indicators are omitted because in this context the decisions to work or go to school are non-separable, thus, their inherent relationship could lead to endogeneity issues.

6. Results:

As mentioned earlier, regressions are run for four key indicators of human capital – enrollment, progression, repeat, and illness rates. In each case, double and triple difference regressions are run with and without control variables to assess the impacts of Oportunidades on the general beneficiary population and indigenous beneficiary population. This format is intended to account for observable influences and to illustrate when they make a substantial

difference in the final estimations. Tests are run for a variety of age groups to identify the time in children's lives when Oportunidades' impacts are strongest. For example, education regressions (enrollment, progression, and repeat rates) begin by testing children between the ages of eight and fifteen, then youths between the ages of twelve and fourteen, and lastly only twelve year old children. Illness rates are initially tested for children between the ages of zero and five, then three to five years old youths, and finally children under the age of three.

These regressions are firstly run using the Indigenous 1 identifier. Secondly, if Indigenous 1 estimations appear sound, then the same set of tests are run using the Indigenous 2 identifier. Additionally, if all of those results appear sound and consistent, then Indigenous 1 results are broken down according to gender. Comparing Oportunidades' results for females and males is important, especially for education indicators, because females typically attain less schooling than their male counterparts.¹⁶⁸

Lastly, if the previous tests are regarded as robust, then Indigenous 1 estimations are broken down across three states: Michocan, Guerrero, and Veracruz. These areas are chosen because Michocan is the least indigenous state in the sample, according to the number of indigenous individuals (Indigenous 1) in the data set, while Guerrero and Veracruz are the most indigenous states. Less than 1% of observations in Michocan are identified as indigenous, while this is the case for nearly 59% of observations in Guerrero and almost 61% of observations in Veracruz. Comparing Michocan, Guerrero, and Veracruz estimations provide a final way to confirm whether or not outcomes vary according to indigenoussness and a method to consider whether they fluctuate considerably due to state differences. Every regression is run as a probit and all findings are reported according to marginal effects (dprobit).

A. Enrollment Rates:

Before beginning it is useful to point out that the particular coefficients of interests in these regressions, which are reported via numerous tables found below, are the double difference (DD) and triple difference (DDD) estimations. Table 8 (below) for eight to fifteen year-olds illustrates that Oportunidades' impact on enrollment for the general beneficiary population (DD) hovers around a 3.5% increase, regardless of controls and indigenous identifiers. These findings are statistically significant above the 99% level, which provides a great deal of confidence concerning Oportunidades' advantageous impact on enrollment. However, Table 8 also points out that Oportunidades' impact on the indigenous group (DDD) is not unique. This is evidenced by that fact that none of the triple difference estimators are even remotely statistically significant. Thus, their noticeably smaller magnitudes, which do imply different and lesser impacts for the indigenous beneficiary group, are not robust and can not be accepted with confidence.

Table 8: Ages 8 to 15 Indigenous Enrollment Triple Difference Results					
<i>Variables:</i>		<i>Indigenous 1 No Controls</i>	<i>Indigenous 1 Controls</i>	<i>Indigenous 2 No Controls</i>	<i>Indigenous 2 Controls</i>
<i>Observations:</i>		48509	48509	48509	48509
Time	(Coefficient)	0.0081	0.0166****	0.0101**	0.0201****
	(P-Score)	(0.199)	(0.001)	(0.059)	(0.000)
Indigenous Identifier		0.0387****	0.0338****	-0.0732****	-0.0381***
		(0.000)	(0.000)	(0.001)	(0.041)
Participation		0.0104**	0.0094***	0.0114***	0.0124****
		(0.075)	(0.049)	(0.021)	(0.003)
Time • Indigenous Identifier		0.0117	0.0186***	0.0529***	0.0578****
		(0.292)	(0.039)	(0.036)	(0.001)
Indigenous Identifier • Participation		-0.0055	-0.0012	-0.0431*	-0.0217
		(0.597)	(0.895)	(0.103)	(0.327)
Time • Participation	(DD)	0.0346****	0.0344****	0.0374****	0.0342****
		(0.000)	(0.000)	(0.000)	(0.000)
Time • Participation • Indigenous	(DDD)	0.0134	0.0006	0.0151	-0.0081
		(0.352)	(0.963)	(0.667)	(0.794)

Notes:

- i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.
- ii) Control variable outcomes are not reported in the interests of brevity; nonetheless, they are available in the appendix.

The estimates for a similar test on twelve to fourteen year-olds, the age range when many Mexican children drop out of school instead of staying on track and transitioning to secondary school, can be found in Table 9 found below. It shows that Oportunidades' impact on the general beneficiary population (DD) is highly significant for all tests. However, the magnitudes of the enrollment increases vary from 4.5 to nearly 6%, depending on controls and indigenousness. This swell in Oportunidades' effect makes sense considering that school enrollment rates start off lower for twelve to fourteen year-olds than for eight to fifteen year-olds. It is interesting to note that in both instances disregarding control variables would have underestimated the program's impact.

Table 9: Ages 12 to 14 Indigenous Enrollment Triple Difference Results

<i>Variables</i>	<i>Indigenous 1 No Controls</i>	<i>Indigenous 1 Controls</i>	<i>Indigenous 2 No Controls</i>	<i>Indigenous 2 Controls</i>
<i>Observations:</i>	18141	18141	18141	18141
Time (Coefficient)	0.0350****	0.0402****	0.0298****	0.0336****
(P-Score)	(0.003)	(0.001)	(0.003)	(0.001)
Indigenous Identifier	0.0743****	0.0889****	-0.0671**	-0.0212
	(0.000)	(0.000)	(0.086)	(0.567)
Participation	0.0128	0.0134	0.0110***	0.0125
	(0.240)	(0.215)	(0.237)	(0.177)
Time • Indigenous Identifier	-0.0101	-0.0089	0.0893**	0.1006***
	(0.637)	(0.677)	(0.057)	(0.022)
Indigenous Identifier • Participation	-0.0192	-0.0172	-0.0496	-0.0183
	(0.333)	(0.382)	(0.314)	(0.694)
Time • Participation (DD)	0.0444****	0.0498****	0.0530****	0.0585****
	(0.003)	(0.001)	(0.000)	(0.000)
Time • Participation • Indigenous (DDD)	0.0335	0.0291	-0.0063	-0.0491
	(0.212)	(0.272)	(0.928)	(0.487)

Notes:

- i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.
- ii) Control variable outcomes are not reported in the interests of brevity; nonetheless, they are available in the appendix.

Additionally, one finds that Oportunidades' impact on enrollment rises by almost one full percentage point for Indigenous 2 tests (DD). This suggests that controlling for heads of households who only speak an indigenous language notably boosts Oportunidades' impact on

enrollment rates during the transition to secondary school. More importantly, the lack of statistical significance in Table 9's triple difference estimations (DDD) proposes that indigenous beneficiaries who only speak an indigenous language do not benefit more or less from Oportunidades than average beneficiaries. Though the magnitude of benefits accruing to indigenous beneficiaries appears smaller, their lack of robustness makes it difficult to confidently draw conclusions – especially for the Indigenous 2 results, which turn out negative in magnitude and much more statistically insignificant.

Next, the same set of regressions are run strictly for twelve year olds, the age when the majority of children transition and, not surprisingly, when Shultz finds Oportunidades' most pronounced effects on enrollment (as mentioned above). Table 10 on the following page provides double difference estimates (DD) of Oportunidades' impact that fluctuate from enrollment increases of 5.5 to 7%, depending on controls and indigenusness. All of these outcomes are statistically significant above the 99% level. Although these findings are not quite as large as Shultz's, the relatively similar magnitude of these estimates appears logical considering unresolved sample size differences and potential variable definition discrepancies. This consistency provides added confidence concerning the robustness of these enrollment boosts.

In this case, it is also noteworthy that the inclusion of control variables avoids an over-estimation of Oportunidades' impacts. In addition, it is evident that for twelve year olds Indigenous 2 tests actually decrease the program's results. In other words, controlling for heads of households who only speak an indigenous language dampens Oportunidades' enrollment boost at age twelve, which is contrary to the estimate for the aforementioned age twelve to

fourteen range. This may be the situation because a critical mass of the twelve to fourteen year-olds leaving school actually dropout at age twelve, regardless of the program.

Table 10: Age 12 Indigenous Enrollment Triple Difference Results

<i>Variables</i>	<i>Indigenous 1 No Controls</i>	<i>Indigenous 1 Controls</i>	<i>Indigenous 2 No Controls</i>	<i>Indigenous 2 Controls</i>
<i>Observations:</i>	6425	6425	6425	6425
Time	(Coefficient) (P-Score)			
	0.0079 (0.615)	0.0099 (0.513)	0.0103 (0.442)	0.0128 (0.326)
Indigenous Identifier	0.0237 (0.231)	0.0457*** (0.022)	-0.1395**** (0.010)	-0.0545 (0.229)
Participation	-0.0095 (0.501)	-0.0035 (0.799)	-0.0080 (0.504)	-0.0012 (0.917)
Time • Indigenous Identifier	0.0219 (0.425)	0.0200 (0.449)	0.0889** (0.062)	0.0794** (0.086)
Indigenous Identifier • Participation	0.0069 (0.785)	0.0013 (0.958)	0.0145 (0.793)	-0.0004 (0.994)
Time • Participation	(DD) 0.0710**** (0.000)	0.0666**** (0.000)	0.0602**** (0.000)	0.0568**** (0.000)
Time • Participation • Indigenous	(DDD) -0.0479 (0.234)	-0.0404 (0.294)	-0.0355 (0.707)	-0.0125 (0.884)

Notes:

- i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.
- ii) Control variable outcomes are not reported in the interests of brevity; nonetheless, they are available in the appendix.

Moreover, Table 10 illustrates that triple difference estimates (DDD) are statistically insignificant, suggesting a lack of program impact variation. Magnitudes appear consistently negative suggesting a disadvantageous outcome at this specific age for twelve year old indigenous beneficiary children, especially for those whose parents do not speak Spanish. Nonetheless, little trust can be put in some of these results because of their lack of statistical robustness. Consequently, all of the results mentioned above, regardless of age, controls, and indigenesness, signify that one *can soundly reject the enrollment component of this study's hypothesis: the impact of Oportunidades on school enrollment does not differ for indigenous populations in Mexico when compared to the program's average affect on general beneficiaries.*

Considering Indigenous 1 impact estimates according to gender also implies that the enrollment component of this study's hypothesis should also be rejected. In all three age range instances, Table 11 on the following page shows that double difference estimates (DD) appear highly significant and reasonable considering the aforementioned results; while triple difference estimates (DDD) appear lower in magnitude, but extremely insignificant. Neither indigenous males nor indigenous females benefit more or less from Oportunidades than general beneficiaries. In other words, these results confirm previous findings concerning enrollment increases and provide added confidence to reject the study's enrollment hypothesis.

Table 11 also demonstrates that enrollment impacts differentiated by gender vary considerably. Oportunidades' average impact (DD) on eight to fifteen year-olds reflects a 3.25% increase in enrollment for females and a 3.63% boost for males at highly significant levels. However, the twelve to fourteen group provides evidence that females (7.04%) benefit over double that of males (3.13%). That being said, it should be noted that the female estimate is considerably more significant than the male one.

Furthermore, the twelve year-old group illustrates that Oportunidades leads to a female enrollment rate boost of 9.48%, which more than doubles the program's impact on twelve year old males (4.11%). Both of these findings are statistically significant above the 90% level. This is the point in a child's life when enrollment rate changes are greatest for females and males, which is consistent (though smaller in magnitude) with Shultz's findings.¹⁶⁹ Thus, it is clear that as children get closer to the transition between primary and secondary school, females benefit more from the program. In addition, it is apparent that Oportunidades' enrollment rate boosts do not differ for the indigenous population due to gender differences.

Table 11: Female & Male Indigenous Enrollment Triple Difference Results		
<i>Variables</i>	<i>Female Indigenous 1 Controls</i>	<i>Male Indigenous 1 Controls</i>
<i>Ages 8 to 15 Observations:</i>		
Time	(Coefficient) 0.0288**** (P-Score) (0.000)	23477 25032 0.0056 (0.420)
Indigenous Identifier	0.0273**** (0.008)	0.0390**** (0.000)
Participation	0.0070 (0.319)	0.0116** (0.077)
Time • Indigenous Identifier	0.0114 (0.397)	0.0257*** (0.033)
Indigenous Identifier • Participation	0.0008 (0.949)	-0.0030 (0.802)
Time • Participation	(DD) 0.0325**** (0.001)	0.0363**** (0.000)
Time • Participation • Indigenous	(DDD) 0.0105 (0.552)	-0.0097 (0.752)
<i>Ages 12 to 14:</i>		
Time	(Coefficient) 0.0553**** (P-Score) (0.002)	8635 9506 0.0271** (0.077)
Indigenous Identifier	0.0956**** (0.000)	0.0824**** (0.000)
Participation	0.0036 (0.829)	0.0245** (0.084)
Time • Indigenous Identifier	-0.0385 (0.240)	0.0198 (0.467)
Indigenous Identifier • Participation	-0.0270 (0.373)	-0.0101 (0.692)
Time • Participation	(DD) 0.0704**** (0.002)	0.0313* (0.108)
Time • Participation • Indigenous	(DDD) 0.0459 (0.250)	0.0114 (0.748)
<i>Ages 12 Observations:</i>		
Time	(Coefficient) 0.0006 (P-Score) (0.980)	3051 3369 0.0185 (0.311)
Indigenous Identifier	0.0389 (0.248)	0.0510*** (0.025)
Participation	-0.0344* (0.128)	0.0252* (0.131)
Time • Indigenous Identifier	0.0287 (0.501)	0.0113 (0.729)
Indigenous Identifier • Participation	0.0178 (0.656)	-0.0153 (0.614)
Time • Participation	(DD) 0.0948**** (0.002)	0.0411** (0.075)
Time • Participation • Indigenous	(DDD) -0.0703 (0.265)	-0.0104 (0.818)

Notes:

i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.¹⁷⁰

Lastly, a comparison of Indigenous 1 double and triple difference results across Michoacan, Guerrero, and Veracruz can be found in Table 12 on the following page. State tests across all three age ranges produce ambiguous results due to a lack of consistent statistical significance and magnitudes. In Michoacan, the state with the smallest proportion of indigenous observations, it appears as though Oportunidades has a statistically significant average effect (DD) of 3.2% on the eight to fifteen year-old range. Its impacts are very significant, though stronger in magnitude, for indigenous beneficiaries (DDD) of the same range. Results for the twelve to fourteen year-old group follows the same pattern, though the average program effect (DD) is a slightly significant enrollment increase of 4.54%. Twelve year-olds in Michoacan appear to benefit the most from Oportunidades (DD), 6.5% at a highly statistically significant level, which is consistent with previous findings. More importantly, indigenous beneficiaries once again do not appear to experience different results from the general beneficiary population, as evidenced by the low statistical significance of the triple difference estimator (DDD).

In Guerrero, one of the most indigenous states in this data set, both double and triple difference impacts are insignificant for the twelve to fourteen year-old range and twelve year-old group. In the case of the eight to fifteen year-olds, enrollment rates increased as a result of Oportunidades by 14.28% for the general beneficiary group (DD) at a highly significant level, while they decreased by 19.69% for the indigenous beneficiary group (DDD) at an equally robust level. This result suggests that there is in fact an enormous difference between the two groups. However, the extensive magnitudes of divergent change are a sign that there may be another influential factor at play in Michoacan's education system (or that regressions' specifications may need to be reviewed).

Table 12 Michocan, Guerrero & Veracruz Indigenous Enrollment Triple Difference Results			
<i>Variables</i>	<i>Michocan Indigenous 1 Controls</i>	<i>Guerrero Indigenous 1 Controls</i>	<i>Veracruz Indigenous 1 Controls</i>
<i>Ages 8 to 15 Observations:</i>			
Time	(Coefficient) 0.0338**** (P-Score) (0.007)	-0.0571 (0.327)	0.0142* (0.138)
Indigenous Identifier	-0.1548 (0.191)	0.0505 (0.298)	0.0589**** (0.000)
Participation	0.0331**** (0.006)	0.0310 (0.504)	0.0083 (0.409)
Time • Indigenous Identifier	-0.0433 (0.736)	0.1682**** (0.002)	0.0125 (0.339)
Indigenous Identifier • Participation	0.0824 (0.314)	-0.0147 (0.772)	0.0127 (0.349)
Time • Participation	(DD) 0.0320*** (0.042)	0.1428*** (0.013)	0.0356**** (0.006)
Time • Participation • Indigenous	(DDD) 0.0820 (0.498)	-0.1969*** (0.020)	-0.0203 (0.323)
<i>Ages 12 to 14 Observations:</i>			
Time	(Coefficient) 0.0318 (P-Score) (0.153)	0.0378 (0.746)	0.0402* (0.154)
Indigenous Identifier	0.1071**** (0.000)	0.1817** (0.073)	-0.1688 (0.472)
Participation	0.0119 (0.611)	0.1587* (0.108)	0.0713**** (0.007)
Time • Indigenous Identifier	-0.0082 (0.789)	0.1633 (0.168)	-0.1278 (0.730)
Indigenous Identifier • Participation	0.0320 (0.304)	-0.0759 (0.482)	0.1865 (0.384)
Time • Participation	(DD) 0.0454* (0.149)	0.0796 (0.508)	0.0651** (0.075)
Time • Participation • Indigenous	(DDD) -0.0052 (0.908)	-0.1752 (0.252)	-0.0487 (0.914)
<i>Age 12 Observations:</i>			
Time	(Coefficient) 0.0402* (P-Score) (0.154)	0.1729 (0.330)	0.0558 (0.038)***
Indigenous Identifier	-0.1688 (0.472)	0.1562 (0.251)	0.0901**** (0.002)
Participation	0.0713*** (0.007)	0.0964 (0.455)	0.0110 (0.669)
Time • Indigenous Identifier	-0.1278 (0.730)	0.0115 (0.953)	-0.0306 (0.428)
Indigenous Identifier • Participation	0.1865** (0.384)	-0.0736 (0.606)	0.0257 (0.462)
Time • Participation	(DD) 0.0651** (0.075)	-0.0599 (0.761)	0.0501 (0.173)
Time • Participation • Indigenous	(DDD) -0.0487 (0.914)	-0.0195 (0.928)	-0.0625 (0.327)

Notes:

i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.¹⁷¹

In Veracruz, the state with the highest proportion of indigenous observations, double and triple difference estimates are also insignificant for the twelve to fourteen year-old and twelve year-old groups. However, Oportunidades' average program effects (DD) for the eight to fifteen year-old range reflect a statistically significant 3.20% increase in enrollment rates. On the other hand, indigenous program impacts (DDD) turn out to be extremely statistically insignificant. In the end, this mix of results across states does not provide ample evidence to support the enrollment component of study's hypothesis, though more investigation should be done to explain Michocan's unique results. *Thus, it can be concluded that Oportunidades impacts do not differ due to indigenoussness: this study's enrollment hypothesis can be rejected.* These findings also illustrate that Oportunidades' impacts may in fact differ substantially across states, a result that should motivate future research on the program's results.

B. Progression & Repeat Rates:

Table 13 on the following page provides the Indigenous 1 progression and repeat test results for children in all three ages groups. It illustrates that Oportunidades had an extremely miniscule positive effect on progression rates of general beneficiaries (DD) for all age ranges, which are statistically insignificant regardless of controls. These results, which seem unlikely considering the well proven increase in enrollment rates, are contrary to Behrman, Sengupta, and Todd's aforementioned findings. This dissimilarity may stem from differences in sample size, the model relied on, or variable definitions. Yet, the fact that these estimates are so far off suggest that there may be an influential specification issue that needs to be revisited.¹⁷² Table 13 provides similarly insignificant small impacts for Oportunidades' indigenous beneficiaries (DDD). Thus, it appears as though the program has a comparable progression impact on

indigenous and general beneficiaries, regardless of the questionable nature of the average program impact results found here.

Table 13: Indigenous Progression Triple Difference Results		
<i>Variables</i>	<i>Indigenous 1 No Controls</i>	<i>Indigenous 1 Controls</i>
<i>Ages 8 to 15 Observations:</i>		
Time	(Coefficient) -0.2840e -4**** (P-Score) (0.000)	-0.3410e -4**** (0.000)
Indigenous Identifier	0.0351**** (0.002)	0.0613**** (0.000)
Participation	0.0211*** (0.012)	0.0282**** (0.001)
Time • Indigenous Identifier	-0.1740e -4*** (0.033)	-0.2040e -4*** (0.013)
Indigenous Identifier • Participation	0.0202 (0.161)	0.0099 (0.502)
Time • Participation	(DD) 0.0578e -4 (0.338)	0.0590e -4 (0.329)
Time • Participation • Indigenous	(DDD) 0.0212e -4 (0.839)	0.0140e -4 (0.891)
<i>Ages 12 to 14 Observations:</i>		
Time	(Coefficient) -0.4780e -4**** (P-Score) (0.000)	0.5240e -4**** (0.000)
Indigenous Identifier	0.0430*** (0.024)	0.0616**** (0.002)
Participation	0.0305*** (0.031)	0.0349*** (0.016)
Time • Indigenous Identifier	-0.4550e -4 (0.749)	-0.0470 e-4 (0.744)
Indigenous Identifier • Participation	0.0774 (0.257)	0.0305 (0.218)
Time • Participation	(DD) -0.0159e -4 (0.877)	0.0200e -4 (0.848)
Time • Participation • Indigenous	(DDD) -0.0714e -4 (0.694)	0.0880e -4 (0.633)
<i>Age 12 Observations:</i>		
Time	(Coefficient) -0.400e -4**** (P-Score) (0.001)	-0.4060e -4**** (0.001)
Indigenous Identifier	0.0125 (0.672)	0.0290 (0.356)
Participation	0.0358* (0.118)	0.0391** (0.090)
Time • Indigenous Identifier	-0.2020e -4 (0.347)	-0.1930e -4 (0.368)
Indigenous Identifier • Participation	-0.0157 (0.685)	-0.0103 (0.790)
Time • Participation	(DD) -0.0664e -4 (0.677)	-0.0540e -4 (0.738)
Time • Participation • Indigenous	(DDD) 0.154e -4 (0.576)	0.0990e -4 (0.720)

Notes:

- i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.
- ii) Control variable outcomes are not reported in the interests of brevity; nonetheless, they are available in the appendix.

When it comes to repeat rates, Table 14 on the following page illustrates somewhat parallel findings for all three age ranges. The magnitude of Oportunidades' appears to reduce repeat rates for the general beneficiary population (DD) in an extremely small manner. In this case double difference estimates are at least 90 to 95% statistically significant across the board, which should provide confidence concerning these findings. However, these results are also debatable considering that Behrman, Sengupta, and Todd find that Oportunidades has a much larger and advantageous effect on repeat rates (as previously mentioned). Such a discrepancy, much like the one above, calls these results into question. This inconsistency is also probably due to differences in the sample size, the model used, definitions of variables, or a misspecification.

In addition, Table 14's triple difference estimates (DDD), all of which are highly insignificant and extremely small, indicate that Oportunidades had a consistent impact on repeat rates, regardless of indigenesness. *Although these tests can not be held with nearly the same degree of confidence as those for enrolment rates (because of their lack of robustness and inconsistency with the existent literature), they do suggest that the repeat and progression elements of this study's hypothesis can be rejected. Progression and repeat estimates do not provide any evidence in support of the hypothesis that Oportunidades' impacts differ between general beneficiary and indigenous beneficiary groups.*¹⁷³

Table 14: Indigenous Repeat Triple Difference Results		
<i>Variables</i>	<i>Indigenous 1 No Controls</i>	<i>Indigenous 1 Controls</i>
<i>Ages 8 to 15 Observations:</i>		
Time	(Coefficient) 0.3030e -4**** (P-Score) (0.000)	-0.2790e -4**** (0.000)
Indigenous Identifier	0.0179*** (0.061)	-0.0045 (0.651)
Participation	0.0183**** (0.010)	0.0146*** (0.040)
Time • Indigenous Identifier	0.1290e -4** (0.051)	0.1340e -4*** (0.041)
Indigenous Identifier • Participation	-0.0223** (0.057)	-0.0177* (0.134)
Time • Participation	(DD) -0.1950e -4**** (0.000)	-0.1940e -4**** (0.000)
Time • Participation • Indigenous	(DDD) 0.0239e -4 (0.778)	-0.0284e -4 (0.736)
<i>Ages 12 to 14 Observations:</i>		
Time	(Coefficient) 0.3130e -4**** (P-Score) (0.000)	0.3060e -4**** (0.000)
Indigenous Identifier	0.0236* (0.108)	0.0047 (0.758)
Participation	0.0197** (0.067)	0.0160* (0.139)
Time • Indigenous Identifier	0.1630e -4* (0.106)	0.1650 e-4* (0.101)
Indigenous Identifier • Participation	-0.0127 (0.478)	-0.0106 (0.554)
Time • Participation	(DD) -0.177e -4*** (0.021)	-0.1750e -4*** (0.022)
Time • Participation • Indigenous	(DDD) -0.9180 (0.477)	-0.0942e -4 (0.463)
<i>Ages 12 Observations:</i>		
Time	(Coefficient) 0.3840e -4**** (P-Score) (0.000)	0.3840e -4**** (0.000)
Indigenous Identifier	0.0181 (0.475)	-0.0068 (0.799)
Participation	0.0210 (0.269)	0.0187 (0.328)
Time • Indigenous Identifier	0.1630e -4 (0.349)	-0.1400e -4 (0.419)
Indigenous Identifier • Participation	-0.0171 (0.585)	-0.0202 (0.516)
Time • Participation	(DD) -0.0259e -4** (0.051)	-0.2630e -4*** (0.046)
Time • Participation • Indigenous	(DDD) 0.1160e -4 (0.602)	0.1470e -4 (0.506)

Notes:

- i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.
- ii) Control variable outcomes are not reported in the interests of brevity; nonetheless, they are available in the appendix.

C. Illness Rates:

Table 15 on the following page reports results concerning Oportunidades' impact on illness rates for young children across three age ranges: zero to five, three to five, and under three. Just like the progression and repeat rates, these outcomes are combined into one table that illustrates a consistent trend. Double difference estimations (DD) for all three groups suggest that the program has decreased illness rates anywhere from .2 to 3.5%. These magnitudes appear to be greatest for the under 3 year old group and smallest for the three to five group; however, none of them are statistically significant above the 80% level and most are considerably less significant. As a result, the precision and accuracy of these results can not be held in great confidence.

It is noteworthy to point out that these average program effect estimations differ substantially from Gertler's aforementioned findings. This discrepancy, like those above, is most likely due to differences in the sample size, the approach used, definitions of variables, or a misspecification. Triple difference illness rate estimates (DDD) prove to be extremely statistically insignificant for all three age ranges. Though this does not provide a great deal of insight with respects to the outcomes and experiences of Oportunidades' beneficiaries, it does suggest that *there is no difference between the program's general and indigenous impacts. In other words, based on these findings it is apparent that the illness component of this study's hypothesis can be rejected, though more investigation is certainly necessary to alleviate robustness complications.*

Table 15: Indigenous Illness Triple Difference Results		
<i>Variables</i>	<i>Indigenous 1 No Controls</i>	<i>Indigenous 1 Controls</i>
<i>Ages 0 to 5 Observations:</i>		
Time	(Coefficient) -0.1119**** (P-Score) (0.000)	-0.0515**** (0.003)
Indigenous Identifier	0.0002 (0.993)	0.0192 (0.308)
Participation	0.0016 (0.903)	0.0025 (0.855)
Time • Indigenous Identifier	-0.0725**** (0.004)	-0.0715**** (0.004)
Indigenous Identifier • Participation	-0.0023 (0.916)	-0.0031 (0.888)
Time • Participation	(DD) -0.0260 (0.188)	-0.0259 (0.190)
Time • Participation • Indigenous	(DDD) 0.0006 (0.986)	-0.0017 (0.960)
<i>Ages 3 to 5:</i>		
Time	(Coefficient) -0.0614**** (P-Score) (0.005)	-0.0470**** (0.035)
Indigenous Identifier	0.0251 (0.405)	0.0525** (0.095)
Participation	-0.0199 (0.391)	-0.0104 (0.656)
Time • Indigenous Identifier	-0.0878**** (0.008)	-0.0899**** (0.006)
Indigenous Identifier • Participation	-0.0044 (0.907)	-0.0151 (0.687)
Time • Participation	(DD) -0.0022 (0.936)	-0.0068 (0.800)
Time • Participation • Indigenous	(DDD) 0.0026 (0.953)	0.0057 (0.899)
<i>Under 3 Years-old:</i>		
Time	(Coefficient) -0.1165**** (P-Score) (0.004)	-0.0902**** (0.029)
Indigenous Identifier	-0.0121 (0.604)	-0.0020 (0.940)
Participation	0.0114 (0.535)	0.0097 (0.595)
Time • Indigenous Identifier	-0.0548 (0.448)	-0.0445 (0.542)
Indigenous Identifier • Participation	0.0008 (0.978)	-0.0080 (0.791)
Time • Participation	(DD) -0.0344 (0.529)	-0.0264 (0.631)
Time • Participation • Indigenous	(DDD) 0.0004 (0.997)	-0.0181 (0.849)

Notes:

- i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.
- ii) Control variable outcomes are not reported in the interests of brevity; nonetheless, they are available in the appendix.

D. In Sum:

Taking into account this illness estimate and the fairly consistent trend of outcomes for education variable makes it exceedingly clear that a difference in indigenous impacts is extremely unlikely. There is little to no proof in support of this study's human capital accumulation hypothesis. To the contrary, there is an unwavering pattern of evidence demonstrating that indigenous beneficiaries do not benefit more or less than general participants from Oportunidades. *This analysis provides sufficient justification to reject the hypothesis that the impact of Oportunidades on human capital (measured by school enrollment, progression, repeat, and illness rates) differs between the general beneficiary population and indigenous beneficiary population in Mexico.*

Although Oportunidades does not appear to have created the expected situation, there is a clear need for further investigation of this issue on numerous fronts. For starters, effort should be spent reviewing the specification of regressions undertaken in this study. Moreover, similar types of analyses should be applied to alternative human capital variables (and welfare measures) before coming to a final conclusion. For instance, tests should be run on school dropout rates, the demand for health services, anemia rates, consumption and caloric acquisitions measures, expected wages, poverty rates, and so forth, to provide a more comprehensive view, point out exceptions, and strengthen understanding of this complicated situation.

7. Conclusion & Implications:

It is clear that the Oportunidades' impacts do not differ for indigenous people, but why is this and what does it mean? First of all, it is important to highlight that the data used for this study may be so concentrated in poverty that it provides few observable variations. Hence, the

findings of this study suggest that within poor populations in Mexico, disadvantages are not necessarily predicated on indigenesness. A positive implication of these findings is that Oportunidades' design and implementation is not biased. It is reaching the extreme poor regardless of if they are indigenous or not. This can be considered as step in the right direction due to the historical discrimination that indigenous people have suffered.

On the other hand, the finding that human capital outcomes are consistent across groups, regardless of indigenesness, poses a seriously worrisome question for Oportunidades: if the program is not disproportionately benefiting indigenous beneficiaries, who are often poorer and more marginalized than their non-indigenous counterparts, then it is contributing to an increase in inequality between indigenous and non-indigenous people. For instance, if indigenous progression rates start off at a lower level, but increase at the same pace as the general population, then the indigenous progression gap will widen. Although the overall human capital situation may improve under such circumstances, this increase in disparity is an irrevocably negative outcome that will exacerbate problems over the long run, if it is not addressed expediently. Special attention needs to be paid by Oportunidades to avoid making already marginalized indigenous groups worse off relative to Mexico's general poor and non-poor populations.

These findings are also distressing because of the well-established fact that indigenous groups do have to overcome more challenges than others to rise out of poverty and succeed. Thus, indigenous children, more than others, need to prevent illnesses, enroll in schools, expedite school progression, and avoid repeating grades at higher rates to accumulate sufficient human capital to merely maintain current inequality levels, open up new doors, or even increase their welfare. If indigenous individuals do not experience a sizeable boost in human capital accumulation, how will they overcome the smaller wages they are paid and the higher likelihood

that they will fall into poverty?¹⁷⁴ Aggravating this matter is evidence demonstrating that indigenous students suffer from diminishing returns to education.¹⁷⁵ Subsequently, it may be argued by some that combating indigenous poverty via human capital accumulation will provide insufficient benefits, relative to costs, to be regarded as truly effective (regardless of how few other options exist). In such a case, it is argued that investigating and implementing effective alternative strategies must become an immediate priority in order to overcome the numerous entrenched obstacles that stand in the way of progress for Mexico's indigenous peoples.

It should also be pointed out that although Oportunidades' impacts on indigenous and general beneficiary groups appear statistically similar, by no means does this indicate that their experiences in the program are alike. In fact, allegorical evidence demonstrates that indigenous groups have a more difficult time complying with conditionalities because of language and cultural barriers. De la Brière notes that the willingness of the indigenous to participate in Oportunidades is diminished due to these unique challenges, while the frustrations associated with participating in the program are heightened.¹⁷⁶ This is namely because Oportunidades (and other conditional cash transfer programs) neither design their interventions specifically for Mexico's indigenous population nor tailor elements of them to accommodate the needs of specific groups who experience inimitable barriers.¹⁷⁷

In addition, the fact that primary school is not taught solely in Spanish, particularly in highly indigenous areas, while secondary school is exclusively taught in Spanish serves as an additional hurdle for indigenous children to grapple with.¹⁷⁸ Indigenous children appear to be partially overcoming this obstacle because their enrollment, progression, and repeat education rate increases as a result of the program do not differ from those of the general the beneficiary group; nonetheless, the difficulty and frustration associated with this transition should not simply

be discounted. It is one of the many real life challenges that symbolize the relatively inferior status of indigenous groups in Mexico's society.

The experience of indigenous beneficiaries may be most different and difficult with respects to Oportunidades' health components. This is due to the fact that clear communication and general sense of welcome are paramount in this type of setting. Allegorical evidence suggests that indigenous beneficiaries suffer greatly from a lack of unambiguous correspondence and comfort at health clinics where doctors, nurses, and staff do not effectively understand the particular needs of clients or convey essential information.¹⁷⁹

As a result, indigenous patients feel uncomfortable, frustrated, and even disrespected at health clinics because of an alienating setting and resultant miscommunications.¹⁸⁰ Not surprisingly, some indigenous beneficiaries prefer to avoid the chaotic and demeaning experience of visiting health clinics.¹⁸¹ Subsequently, it is apparent that there are numerous reasons why the experience of indigenous beneficiaries likely differs from those of the general beneficiary population. Most of these differences appear to be disadvantageous for the indigenous poor of Mexico, as well as Oportunidades. That being said, additional research, particularly investigations that employ more qualitative information gathering techniques, should be undertaken to comprehensively and deeply survey this critical issue.

In the end, it is evident that the most vital policy implication that can be made is that a broad set of programs need to be designed to specifically meet the needs of the indigenous poor. Their circumstances are unique and in need of vast educational, health, labor, economic, and welfare improvements; particularly those that eradicate inequality, instead of furthering it. Some of these changes are unlikely to be provided by demand side subsidies, such as conditional cash transfer programs like Oportunidades, because they are policy issues or necessitate supply side

interventions. Consequently, the fact that poor families do recognize the benefits of good quality education and are often prepared to sacrifice in order to invest in the future of their children, is inadequate to induce substantial increases in human capital accumulation and reductions in poverty; complimentary interventions are also needed.¹⁸²

So how else will the intergenerational poverty be broken? What will it take to break the self perpetuating cycle of (indigenous) marginalization? Tailored investment in indigenous human capital accumulation and *alternative strategies*, including fully integrated demand and supply side interventions, must be intensified to close existing indigenous poverty and human capital gaps; otherwise indigenous Mexicans will remain in profound and persistent poverty because of the unique and overwhelming obstacles they face (or even become more marginalized due to rising inequality). In conclusion, this study highlights the need to find tangible action-oriented answers to the following urgent research question: what alternatives strategies tailored to the needs of the indigenous are available, feasible, and expected to be the most effective?

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9. Appendix:

Though the influence of control variables is not dissected in this investigation due to a lack of space, assessing their power to sway outcomes is a worthwhile endeavor. The marginal effects of control variables for most regressions are consequently reported below for the reader's convenience and to facilitate additional evaluation of this topic:

Table 8a: Ages 8 to 15 Indigenous Enrollment Controls		
<i>Variables:</i>	<i>Indigenous 1 Controls</i>	<i>Indigenous 2 Controls</i>
<i>Observations:</i>	48509	48509
Household Size (Coefficient) (P-Score)	-0.0018**** (0.003)	-0.0020**** (0.001)
Age	-0.0588**** (0.000)	-0.0591**** (0.0000)
Male	0.0226**** (0.000)	0.0229**** (0.000)
Head Years of Education	0.0115**** (0.000)	0.0118**** (0.000)
Total Land Used/Owned	0.0008*** (0.037)	0.0006** (0.071)
Owns Cattle	0.0016**** (0.000)	0.0014**** (0.001)
Electricity	0.0331**** (0.000)	0.0369**** (0.000)
Earth-floor	-0.0031 (0.322)	0.0017 (.586)
Marginalization Index	-0.0178**** (0.000)	-0.0052** (0.052)
Education Committee	0.0026 (0.392)	-0.0122**** (0.000)
Secondary School	-0.0102 (0.768)	0.0029 (0.764)
Guerrero	-0.0559**** (0.000)	-0.0652**** (0.000)
Hidalgo	-0.0072* (0.147)	-0.0107*** (0.034)
Michocan	-0.0424**** (0.000)	-0.0640**** (0.0000)
Puebla	-0.0331**** (0.000)	-0.0428**** (0.000)
Queretaro	-0.0915**** (0.000)	-0.1046**** (0.000)
San Luis	0.0101*** (0.036)	-0.0011 (0.826)

Notes:

i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.

Table 9a: Ages 12 to 14 Indigenous Enrollment Controls		
<i>Variables</i>	<i>Indigenous 1 Controls</i>	<i>Indigenous 2 Controls</i>
<i>Observations:</i>	18141	18141
Household Size (Coefficient) (P-Score)	-0.0047**** (0.001)	-0.0049**** (0.000)
Age	-0.1108**** (0.000)	-0.1108**** (0.0000)
Male	0.0600**** (0.000)	0.0606**** (0.000)
Head Years of Education	0.0198**** (0.000)	0.0208**** (0.000)
Total Land Used/Owned	0.0008 (0.306)	0.0007** (0.375)
Owns Cattle	0.0026*** (0.014)	0.0022*** (0.029)
Electricity	0.0598**** (0.000)	0.0665**** (0.000)
Earth-floor	-0.0006 (0.935)	0.0078 (.275)
Marginalization Index	-0.0322**** (0.000)	-0.0099** (0.090)
Education Committee	0.0004 (0.948)	0.0069 (0.295)
Secondary School	-0.0239 (0.785)	-0.0456 (0.609)
Guerrero	-0.0564**** (0.000)	-0.0689**** (0.000)
Hidalgo	-0.0099 (0.369)	-0.0165* (0.137)
Michoacan	-0.0787**** (0.000)	-0.1140**** (0.0000)
Puebla	-0.0614**** (0.000)	-0.0804**** (0.000)
Queretaro	-0.1382**** (0.000)	-0.1610**** (0.000)
San Luis	0.0228*** (0.036)	-0.0039 (0.718)

Notes:

i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.

Table 10a: Age 12 Indigenous Enrollment Controls		
<i>Variables</i>	<i>Indigenous 1 Controls</i>	<i>Indigenous 2 Controls</i>
<i>Observations:</i>	6425	6425
Household Size (Coefficient) (P-Score)	-0.0023 (0.206)	-0.0025 (0.179)
Male	0.0564**** (0.000)	0.0564**** (0.000)
Head Years of Education	0.0128**** (0.000)	0.0130**** (0.000)
Total Land Used/Owned	0.0004	0.0003**

	(0.706)	(0.795)
Owns Cattle	0.0032***	0.0032***
	(0.039)	(0.043)
Electricity	0.0278***	0.0297****
	(0.011)	(0.007)
Earth-floor	-0.0056	0.0017
	(0.552)	(.855)
Marginalization Index	-0.0259****	-0.0133**
	(0.001)	(0.078)
Education Committee	-0.0054	0.0086
	(0.544)	(0.338)
Secondary School	-0.0000	-0.0386
	(1.000)	(0.761)
Guerrero	-0.0704****	-0.0779****
	(0.000)	(0.000)
Hidalgo	-0.0354***	-0.0397****
	(0.019)	(0.009)
Michocan	-0.0567****	-0.0788****
	(0.001)	(0.000)
Puebla	-0.0435****	-0.0558****
	(0.003)	(0.000)
Queretaro	-0.1199****	-0.1365****
	(0.000)	(0.000)
San Luis	0.0113	0.0010
	(0.442)	(0.948)

Notes:

i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.

Table 13a: Indigenous Progression Controls				
<i>Variables</i>		<i>8 to 15 Indigenous 1 Controls</i>	<i>12 to 14 Indigenous 1 Controls</i>	<i>12 Indigenous 1 Controls</i>
<i>Observations:</i>		37533	13472	4961
Household Size	(Coefficient)	-0.0063****	-0.0089****	-0.0100****
	(P-Score)	(0.000)	(0.000)	(0.001)
Age		-0.0400****	-0.0558****	N/A
		(0.000)	(0.000)	N/A
Male		0.0093**	0.0537****	0.0475****
		(0.054)	(0.000)	(0.000)
Head Years of Education		0.0147****	0.0192****	0.0137****
		(0.000)	(0.000)	(0.000)
Total Land Used/Owned		0.0009	0.0010	-0.0018
		(0.174)	(0.371)	(0.284)
Owns Cattle		0.0025****	0.0029***	0.0030**
		(0.001)	(0.014)	(0.073)
Electricity		0.0271****	0.0511****	0.0398****
		(0.000)	(0.000)	(0.021)
Earth-floor		-0.0048	-0.0134	-0.0279**
		(0.387)	(0.157)	(0.053)
Marginalization Index		-0.0146****	-0.0318****	-0.0140
		(0.002)	(0.000)	(0.267)
Education Committee		0.0031	-0.0094	-0.0075

Secondary School	(0.571) 0.0267 (0.660)	(0.302) -0.0436 (0.706)	(0.590) 0.0863 (0.644)
Guerrero	-0.0922**** (0.000)	-0.0656**** (0.001)	-0.0920**** (0.002)
Hidalgo	0.0054 (0.520)	-0.0318*** (0.031)	-0.0520*** (0.021)
Michocan	-0.0069 (0.442)	-0.0674**** (0.000)	-0.0566*** (0.021)
Puebla	-0.0182*** (0.024)	-0.0482**** (0.001)	-0.0429*** (0.048)
Queretaro	0.0071**** (0.557)	-0.8259**** (0.000)	-0.0692*** (0.037)
San Luis	0.0486**** (0.000)	0.0522**** (0.000)	0.0287 (0.179)

Notes:

i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.

Table 14a: Indigenous Repeat Controls			
<i>Variables</i>	<i>8 to 15 Indigenous 1 Controls</i>	<i>12 to 14 Indigenous 1 Controls</i>	<i>12 Indigenous 1 Controls</i>
<i>Observations:</i>	37533	13472	4953
Household Size (Coefficient) (P-Score)	0.0038**** (0.000)	0.0035**** (0.010)	0.0072**** (0.002)
Age	-0.0179**** (0.000)	-0.0179**** (0.000)	N/A N/A
Male	0.0158**** (0.000)	0.0027 (0.654)	0.0018 (0.864)
Head Years of Education	-0.0036**** (0.000)	-0.0013 (0.316)	-0.0032* (0.146)
Total Land Used/Owned	-0.9230e -4 (0.863)	-0.7340e -4 (0.925)	0.0015 (0.293)
Owns Cattle	-0.0009** (0.100)	-0.0007 (0.324)	-0.0009 (0.454)
Electricity	0.0044 (0.406)	0.0040 (0.620)	-0.0157 (0.256)
Earth-floor	0.0081** (0.070)	0.0195**** (0.004)	0.0238*** (0.040)
Marginalization Index	-0.0041 (0.308)	-0.0043 (0.479)	-0.0094 (0.351)
Education Committee	0.0016 (0.726)	0.0040 (0.522)	0.0281*** (0.014)
Secondary School	0.0130 (0.338)	-0.0358 (0.648)	N/A N/A
Guerrero	0.0338**** (0.000)	0.0144 (0.288)	0.0263 (0.274)
Hidalgo	-0.0034 (0.610)	0.0219*** (0.034)	0.0217 (0.228)
Michocan	-0.0404*** (0.000)	-0.0371**** (0.000)	-0.0183 (0.339)
Puebla	-0.0026	0.0030	0.0069

	(0.681)	(0.757)	(0.686)
Queretaro	-0.0639****	-0.0377****	-0.0293
	(0.000)	(0.010)	(0.242)
San Luis	-0.0345****	-0.0304****	-0.0201
	(0.000)	(0.002)	(0.234)

Notes:

- i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.
- ii) Secondary school is dropped for age 12 because the absence of one perfectly predicts failure.

Table 15a: Indigenous Illness Controls			
<i>Variables</i>	<i>0 to 5 Indigenous 1 Controls</i>	<i>3 to 5 Indigenous 1 Controls</i>	<i>Under 3 Indigenous 1 Controls</i>
<i>Observations:</i>	12766	7579	5187
Household Size (Coefficient) (P-Score)	-0.0075**** (0.000)	-0.0073**** (0.000)	-0.0074**** (0.010)
Age	-0.0297**** (0.000)	-0.0136*** (0.039)	-0.0528**** (0.000)
Male	-0.0010 (0.894)	-0.0100 (0.283)	0.0122 (0.360)
Head Years of Education	0.0003 (0.845)	0.0018 (0.321)	-0.0019 (0.455)
Total Land Used/Owned	0.0012 (0.229)	0.0018** (0.096)	-0.955e -4 (0.957)
Owens Cattle	0.0002 (0.892)	0.0002 (0.919)	0.0003 (0.906)
Electricity	0.0132 (0.186)	0.0177 (0.135)	0.0099 (0.558)
Earth-floor	-0.0521**** (0.000)	-0.0580**** (0.000)	-0.0383*** (0.014)
Marginalization Index	-0.0031 (0.669)	0.0024 (0.788)	-0.0068 (0.590)
Education Committee	0.0014 (0.866)	-0.0064 (0.512)	-0.0097 (0.504)
Secondary School	0.0332 (0.768)	0.0609*** (0.021)	.1245 (0.624)
Guerrero	0.0186 (0.288)	-0.0123 (0.555)	0.0648*** (0.031)
Hidalgo	-0.0236** (0.064)	0.0009 (0.951)	-0.0621**** (0.004)
Michocan	0.0269** (0.078)	0.0216 (0.232)	0.0402 (0.125)
Puebla	-0.0138 (0.280)	-0.0222* (0.141)	-0.0023 (0.918)
Queretaro	-0.0696**** (0.000)	-0.0432*** (0.039)	-0.1067**** (0.001)
San Luis	-0.0280*** (0.026)	-0.0269**** (0.075)**	-0.0262 (0.222)

Notes:

- i) Four asterisks (****) indicate significance over 99%, three (***) indicate significance over 95%, two (**) indicate significance over 90%, and one (*) indicates significance over 85%.

10. Endnotes:

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- ¹ Bando, R., Lopez-Calva, L., and Patrinos, H., Child Labor, School Attendance, and Indigenous Households: Evidence from Mexico, *World Bank Research Working Paper* No. 3487 (Washington, D.C.: The World Bank, January 2005), p. 2.
- ² Psacharopoulos, G. and Patrinos, H., *Indigenous People and Poverty in Latin America* (Washington, D.C.: The World Bank, 1996), p. xi-xii.
- ³ Psacharopoulos and Patrinos, p. xi-xx.
- ⁴ Psacharopoulos and Patrinos, p. xi-xix.
- ⁵ Psacharopoulos and Patrinos, p. xi-xii.
- ⁶ Skoufias, E. and Parker, S.W., Conditional Cash Transfers and their Impact on Child Work and Schooling: Evidence from the PROGRESA Program in Mexico, *FCND Discussion Paper*, No. 123 (Washington D.C: IFPRI, 2001), p. 1. – A lack of jobs and credit, distorted relationships with markets, and insufficient infrastructure have often been the focus.
- ⁷ Bando, Lopez-Calva, and Patrinos, p. 2.
- ⁸ Psacharopoulos and Patrinos, p. 131.
- ⁹ Psacharopoulos and Patrinos, p. 131.
- ¹⁰ Psacharopoulos and Patrinos, p. 134.
- ¹¹ Psacharopoulos and Patrinos, p. 154.
- ¹² Levy, S. and Rodriguez, E., *Economic Crisis, Political Transition and Poverty Policy Reform: Mexico's PROGRESA-Oportunidades Program* (Washington, D.C: IDB, 2004), p. 1.
- ¹³ Hanson, G., Globalization, Labor Income, and Poverty in Mexico, *NBER Working Paper* No. 11027 (San Diego, CA: University of San Diego, 2005).
- ¹⁴ Levy and Rodriguez, p. 1.
- ¹⁵ Levy and Rodriguez, p. 15.
- ¹⁶ Levy and Rodriguez, p. 15.
- ¹⁷ Levy and Rodriguez, p. 16.
- ¹⁸ Levy and Rodriguez, p. 17.
- ¹⁹ Levy and Rodriguez, p. 18.
- ²⁰ Levy and Rodriguez, p. 14.
- ²¹ Levy and Rodriguez, p. 19.
- ²² International Food Policy Research Institute (IFPRI), PROGRESA, *IFPRI Online*; available from <http://www.ifpri.org/themes/progres.htm>; Internet; accessed on November 20, 2005.
- ²³ Levy and Rodriguez, p. 12. – In 1994, approximately six out of ten rural households were poor, in comparison to fewer than two out of ten urban households.
- ²⁴ Shultz, T.P., The Impact of PROGRESA on School Enrollments, Final report submitted to PROGRESA, (Washington, D.C.: IFPRI, 2000), p. iv. – Though this is somewhat of an oversimplification of the program, it explains the focal point of Oportunidades' activities, which are explained in more detail in the following pages.
- ²⁵ Skoufias, E., PROGRESA and its Impacts on the Welfare of Rural Households in Mexico, *Research Report*, No. 139 (Washington, D.C.: IFPRI, 2005), p. 2.
- ²⁶ Skoufias, p. ix.
- ²⁷ Shultz, p. iv.
- ²⁸ Inter-American Development Bank (IDB) America, Mexico's Oportunidades: An Interview with Miguel Szekely, Undersecretary of Social Development, *IDB America Online*; available from <http://www.iadb.org/iadbamerica/index.cfm?thisid=3169>; Internet; accessed on November 20, 2005.
- ²⁹ IDB America, "Mexico's Oportunidades."
- ³⁰ This is not surprising considering the general "...dearth of empirical research on the magnitude of differences in the mean achievements of indigenous and non-indigenous students..." McEwan, P.J., The Indigenous Test Score Gap in Bolivia and Chile, *Economic Development and Cultural Change*, Vol. 53, No. 1 (October 2005), p. 158. For one of the only evaluations of Oportunidades that tests for differential impacts on indigenous versus non-indigenous

groups please see – Parker, S.W. and Teurel, G., *Schooling Inequality and Language Barriers, Documento de Trabajo, Centro de Investigación y Docencia Económicas* (Mexico, 2003).

³¹ Levy and Rodriguez, p. 7.

³² Skoufias and Parker, p. 3.

³³ International Food Policy Research Institute (IFPRI), PROGRESA, *IFPRI Online*; available from <http://www.ifpri.org/themes/progres.htm>; Internet; accessed on November 20, 2005.

³⁴ Levy and Rodriguez, p. 6.

³⁵ It was specifically designed as a points system that takes into account various factors to objectively rank households and ultimately forms the basis for the transparent and non-political system for allocating benefits to the poor. Inter-American Development Bank (IDB) America, *The Story Behind PROGRESA, IDB America Online*; available from <http://www.iadb.org/idbamerica/index.cfm?thisid=3049>; Internet; accessed on November 20, 2005.

³⁶ Skoufias, p. 34.

³⁷ Levy and Rodriguez, p. 49.

³⁸ Skoufias, p. 1.

³⁹ Levy and Rodriguez, p. 13. – The depth of poverty, as measured by an index, is 23.9 for the rural population and 8.9 for the total population.

⁴⁰ Levy and Rodriguez, p. 13. – The depth of poverty, as measured by an index, is 2.4 for the urban population.

⁴¹ Levy and Rodriguez, p. 13. – The severity of poverty, as measured by an index is 12.7 for the rural population and 4.3 for the total population.

⁴² Levy and Rodriguez, p. 13. – The severity of poverty, as measured by an index, is 1.0 for the urban population.

⁴³ Skoufias, p. 34.

⁴⁴ Levy and Rodriguez, p. 78.

⁴⁵ Skoufias, p. 34.

⁴⁶ Skoufias and Parker, p. 5.

⁴⁷ Levy and Rodriguez, p. 42; Lipton, M. and Ravallion, M., *Poverty and Policy, Handbook of Development Economics*, Vol. III., ed. by Behrman and Srinivasan (North-Holland, 1999), pp. 2553-2675.

⁴⁸ Levy and Rodriguez, pp. 42-46.

⁴⁹ Skoufias, p. 22.

⁵⁰ Skoufias, p. 2.

⁵¹ Skoufias, p. 22.

⁵² Levy and Rodriguez, p. 46.

⁵³ Levy and Rodriguez, p. 46.

⁵⁴ International Food Policy Research Institute (IFPRI), PROGRESA, *IFPRI Online*; available from <http://www.ifpri.org/themes/progres.htm>; Internet; accessed on November 20, 2005.

⁵⁵ Levy and Rodriguez, p. 70.

⁵⁶ Skoufias, p. 3.

⁵⁷ Skoufias, p. 3.

⁵⁸ Levy and Rodriguez, p. 70.

⁵⁹ Skoufias and Parker, p. 5.

⁶⁰ Levy and Rodriguez, p. 71.

⁶¹ Levy and Rodriguez, p. 71.

⁶² Levy and Rodriguez, p. 71.

⁶³ Levy and Rodriguez, p. 72.

⁶⁴ Levy and Rodriguez, p. 72.

⁶⁵ Skoufias, p. 3.

⁶⁶ Levy and Rodriguez, p. 72.

⁶⁷ Skoufias, p. 5.

⁶⁸ Skoufias and Parker, p. 7.

⁶⁹ Skoufias, p. 72

⁷⁰ Levy and Rodriguez, p. 71.

⁷¹ Skoufias, p. 5.

⁷² Levy and Rodriguez, p. 72.

⁷³ Levy and Rodriguez, p. 72.

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- ⁷⁴ Skoufias, p. 6.
- ⁷⁵ Levy and Rodriguez, p. 73.
- ⁷⁶ Levy and Rodriguez, p. 73.
- ⁷⁷ Skoufias, p. 7.
- ⁷⁸ Levy and Rodriguez, p. 75.
- ⁷⁹ Skoufias, p. 7.
- ⁸⁰ Skoufias, p. 7.
- ⁸¹ Levy and Rodriguez, p. 75.
- ⁸² Skoufias and Parker, p. 7.
- ⁸³ Levy and Rodriguez, p. 75.
- ⁸⁴ Levy and Rodriguez, p. 71.
- ⁸⁵ Levy and Rodriguez, p. 75.
- ⁸⁶ Skoufias, p. 8.
- ⁸⁷ Levy and Rodriguez, p. 76.
- ⁸⁸ Skoufias, p. 9.
- ⁸⁹ Levy and Rodriguez, p. 76.
- ⁹⁰ Levy and Rodriguez, p. 76.
- ⁹¹ Levy and Rodriguez, p. 76.
- ⁹² Levy and Rodriguez, 76.
- ⁹³ Skoufias, p.3.
- ⁹⁴ Levy and Rodriguez, p. 77.
- ⁹⁵ Levy and Rodriguez, p. 77.
- ⁹⁶ Levy and Rodriguez, p. 79.
- ⁹⁷ Skoufias, p. 3.
- ⁹⁸ Skoufias and Parker, p. 1.
- ⁹⁹ Levy and Rodriguez, p. 77.
- ¹⁰⁰ Levy and Rodriguez, p. 77.
- ¹⁰¹ Levy and Rodriguez, pp. 87-88.
- ¹⁰² Levy and Rodriguez, p. 87. Though these figures vary in other studies, they do not deviate by much. Oportunidades is consistently regarded as one of the more cost-efficient anti-poverty programs in operation. For alternative assessments see Skoufias, p. 63, and Coady, D., *The Application of Social Cost-Benefit Analysis to the Evaluation of PROGRESA*, Final report submitted to PROGRESA. (Washington, D.C.: IFPRI, 2000).
- ¹⁰³ Bando, Lopez-Calva, and Patrinos, p. 17.
- ¹⁰⁴ Grosh, M., *Administering Targeting Social Programs in Latin America: From Platitudes to Practice* (Washington, D.C.: The World Bank, 1994).
- ¹⁰⁵ Levy and Rodriguez, p. 84.
- ¹⁰⁶ Levy and Rodriguez, p. 84.
- ¹⁰⁷ Levy and Rodriguez, p. 84.
- ¹⁰⁸ Levy and Rodriguez, p. 138.
- ¹⁰⁹ For a more detailed discussion concerning the political economy of Oportunidades and Mexico's social programs see Levy and Rodriguez, pp. 137-147.
- ¹¹⁰ Levy and Rodriguez, pp. 112-136.
- ¹¹¹ Shultz, p. 20.
- ¹¹² Shultz, p. 5.
- ¹¹³ Skoufias, p. 52.
- ¹¹⁴ Behrman, J.R., Sengupta, P., and Todd, P., *Progression through PROGRESA: An Impact Assessment of a School Subsidy Experiment*, Project Papers and Briefs (Washington, D.C.: IFPRI, April 2001), pp. 17-18; Skoufias, E. and Parker, S.W., *Conditional Cash Transfers and their Impact on Child Work and Schooling: Evidence from the PROGRESA Program in Mexico*, *FCND Discussion Paper*, No. 123 (Washington D.C.: IFPRI, 2001), p. 1
- ¹¹⁵ Levy and Rodriguez, p. 126.
- ¹¹⁶ Gertler, P., *The Impact of PROGRESA on Health*, Final reported submitted to PROGRESSA (Washington, D.C.: IFPRI, 2000), p. iv.
- ¹¹⁷ Gertler, P., *Do Conditional Cash Transfers Improve Child Health? Evidence from PROGRESA's Control Randomized Experiment*, *Health, Health Care, and Economic Development*, Vol. 94, No. 2 (May 2004), p. 340.

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- ¹¹⁸ Paul Gertler (a), p. iv.
- ¹¹⁹ Gertler (a), p. 12.
- ¹²⁰ Levy and Rodriguez, pp. 118.
- ¹²¹ Hoddinott, J., Skoufias, E., and Washburn, R., The Impacts of PROGRESA on Consumption, Final report submitted to PROGRESSA (Washington, D.C: IFPRI, 2000), p. iv.
- ¹²² Hoddinott, Skoufias, and Washburn, p. v.
- ¹²³ Skoufias, p. 59.
- ¹²⁴ Skoufias, p. 37.
- ¹²⁵ Skoufias, p. 37.
- ¹²⁶ Skoufias, p. 51.
- ¹²⁷ Levy and Rodriguez, p. 46
- ¹²⁸ It should be noted that human capital theory, as evidenced by the literature, originally refers to the attainment of education. This is logical because it is seen as the direct link between increased earnings and improved welfare. Nonetheless, one should not overlook the fact that such theory assumes a basic level of health that allows the individual to effectively participate in education and labor arenas. Though Oportunidades is not the first program to combine the two, it should still be regarded as a step forward in the understanding of human capital accumulation in all its dimensions. This is because it explicitly synthesizes the idea that basic health is a prerequisite to substantial education attainment and genuine human capital accumulation in both theory and practice.
- ¹²⁹ For more details see – Shultz, T.P., Investing in Human Capital, *American Economic Review*, Vol. 51, No. 1 (March 1961), pp. 1-17; and Becker, G.S., *Human Capital* (New York: National Bureau of Economic Research, 1975).
- ¹³⁰ Psacharopoulos, G., Ethnicity, Education, and Earnings in Bolivia and Guatemala, *Comparative Education Review*, Vol. 37, No. 1, Special Issues on Ethnicity (February 1993), p. 9.
- ¹³¹ For more details see – Mincer, J., *Schooling, Experience, and Earnings* (New York: Columbia University Press, 1974).
- ¹³² Shultz, p. 10.
- ¹³³ Shultz, p. 10.
- ¹³⁴ Shultz, p. 10.
- ¹³⁵ Shultz, p. 10.
- ¹³⁶ Emmanuel Skoufias and Susan W. Parker, p. 3.
- ¹³⁷ Mayer, S.E., *What Money Can't Buy: Family Income and Children's Life Chances* (Cambridge, MA: Harvard University Press, 1997); Currie, J., *Welfare and the Well Being of Children: Fundamentals of Pure and Applied Economics* (Chur, Switzerland: Harwood Academic, 1995)0.
- ¹³⁸ Emmanuel Skoufias and Susan W. Parker, p. 3.
- ¹³⁹ Skoufias and Parker, p. 3.
- ¹⁴⁰ Skoufias, p. 17.
- ¹⁴¹ Skoufias, p. 17.
- ¹⁴² Skoufias, p. 17
- ¹⁴³ Bando, Lopez-Calva, and Patrinos, p. 3.
- ¹⁴⁴ Bando, Lopez-Calva, and Patrinos, p. 4.
- ¹⁴⁵ Bando, Lopez-Calva, and Patrinos, p. 3.
- ¹⁴⁶ McEwan, p. 1-3.
- ¹⁴⁷ Bando, Lopez-Calva, and Patrinos, p. 3.
- ¹⁴⁸ McEwan, p. 1.
- ¹⁴⁹ Shultz, pp. 2-5.
- ¹⁵⁰ Bando, Lopez-Calva, and Patrinos, p. 5.
- ¹⁵¹ Bando, Lopez-Calva, and Patrinos, p. 3.
- ¹⁵² Bando, Lopez-Calva, and Patrinos, p. 3
- ¹⁵³ Bando, Lopez-Calva, and Patrinos, p. 3
- ¹⁵⁴ Psacharopoulos and Patrinos, p. 14-15.
- ¹⁵⁵ Psacharopoulos and Patrinos, p. 7.

¹⁵⁶ In other words, school attendance is taken to be a proxy for enrollment because direct enrollment information is not available from the surveys.

¹⁵⁷ Behrman, Sengupta, and Todd, p. 5. – This is what Behrman, Sengupta, and Todd do in their investigation: they allow students to skip grades because this is quite common; especially in the case of children entering school for the first time who are placed in grade two or three with the rest of their age cohort. On the other hand, it is uncommon for students to skip more than three grades. This restriction is not applied to enrollment outcomes in order to make this study's findings more comparable to Shultz's, who does not employ this limitation.

¹⁵⁸ Bando, Lopez-Calva, and Patrinos, p. 17. This is a common practice, which is exemplified by Bando, Lopez-Calva, and Patrinos on p. 17. of their study.

¹⁵⁹ An alternative measure that is not used in this instance, but can also be valuable, is whether or not a person identifies him or herself as indigenous.

¹⁶⁰ Land markets in rural Mexico are not considered to be extremely deep or active. Thus, if a household uses land it is most likely the owner.

¹⁶¹ This section, including the equations, is a simplified version borrowed from – Maluccio, J., Coping with the 'Coffee Crisis' in Central America: The Role of the Nicaraguan Red de Protección Social, *FCND Discussion Paper*, No. 188 (Washington, D.C.: IFPRI, February 2005), pp. 17-21.

¹⁶² Skoufias, p. xi.

¹⁶³ Levy and Rodriguez, p. 113.

¹⁶⁴ Levy and Rodriguez, p. 113.

¹⁶⁵ Levy and Rodriguez, p. 114.

¹⁶⁶ Ravallion, M., The Mystery of the Vanishing Benefits: Ms. Speedy Analyst's Introduction to Evaluation, *World Bank Economic Review* Vol. 15, No. 1, (2001), pp. 115-140.

¹⁶⁷ State dummies are included to account for regional differences. Dummies are included for every state except for Veracruz, which has the largest number of observations in this data set. Thus, all state dummy variables should be interpreted in relation to Veracruz.

¹⁶⁸ This is also a meaningful comparison because it serves as a way to evaluate the gender sensitive design of Oportunidades' enrollment grant structure, which provides transfers of higher values for females starting in secondary school to encourage continuing participation.

¹⁶⁹ This can be seen as a positive sign for Oportunidades' gender sensitive design.

¹⁷⁰ Control variable outcomes are not reported because they are not central to the point of this test, thus they are not available in the appendix. The same controls are used in this test as previous regressions, except for Male.

¹⁷¹ Control variable outcomes are not reported because they are not central to the point of this test, thus they are not available in the appendix.

¹⁷² Behrman, Sengupta, and Todd, pp. 4-6. – That authors employ a Markov Matrix model to assess progression and repeat outcomes.

¹⁷³ The fact that progression and repeat rate estimates suggest statistically insignificant mixed magnitudes precludes running additional tests for Indigenous 2 or breaking Indigenous 1 down by gender and state. These results would likely also turn out not to be statistically insignificant, untrustworthy, and unsettled. Before moving on to additional tests, it would be preferable to review Indigenous 1 tests and ensure their accuracy.

¹⁷⁴ Ilahi, N., Orazem, O., and Sedlacek, G., The Implications of Child Labor and Adult Wages, Income, and Poverty: Retrospective Evidence from Brazil, mimeo (Washington, D.C.: The World Bank, 2000).

¹⁷⁵ Psacharopoulos, p. 19.

¹⁷⁶ De la Brière, B., personal conversation, Conditional Cash Transfers: A Fresh Assessment, International Development Forum (Washington, D.C.: School of International Service at American University, March 28, 2006).

¹⁷⁷ De la Brière, B., personal conversation. It should be noted that providing tapes of health talks in indigenous languages is the sole example of intervention adaptation.

¹⁷⁸ This should not to be misinterpreted as support for eradicating the use of multiple languages in primary school. Instead, it should be understood as justification for universal, tailored bilingual education.

¹⁷⁹ De la O Campos, A.P., personal conversation (Washington, D.C.: School of International Service at American University, April 4, 2006).

¹⁸⁰ De la O Campos, A.P., personal conversation (Washington, D.C.: School of International Service at American University, April 4, 2006).

¹⁸¹ It is important to note that this point is based solely on communication issues; nonetheless, allegorical evidence also suggests that indigenous groups may avoid health interventions (visits and talks) for two additional reasons.

First of all, the health practices being advocated by doctors and the program may be culturally insensitive because they conflict with traditional indigenous practices. Secondly, allegorical evidence suggests that disrespectful behavior by health staff further contributes to this uneasy dynamic.

¹⁸² Bando, Lopez-Calva, and Patrinos, p. 6.