

## Youth Mexican labor market, ethnicity and education 2010

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### Abstract

This research reviews the general aspects of the young labor market, the general conditions in Latin America and in Mexico, and a cross section econometric model for comparison of indigenous and non-indigenous youth in year 2010, as per the latest information available from Census 2010. An important difference was found in the states where there is a predominance of indigenous population—Oaxaca, Chiapas, Yucatan and Quintana Roo—in them, the education variable is important, because it has a greater elasticity. In other words, an increase of 10% of young employed people with completed secondary education, increases the employment probability to 8% of young people who obtain wages of around two minimum wages. Similarly, in states where the young people are predominantly indigenous, their getting jobs with social security also has a positive relationship with income, which means that a few more of them could get two minimum wages, or a wage that gets them out of extreme poverty.

### Youth indigenous, education, econometric model, States

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## Introduction

Youth employment is typically associated with limited job opportunities and high job turnover rates and a large percentage of young people, who are neither studying nor working or in training (NEET). Several variables affect youth employment and according to Freeman and Wise (1982), severe unemployment is concentrated among a small proportion of youths with distinctive characteristics, such as black youths. Sometimes, not working in earlier years could have a negative effect on subsequent wages because wage increases are related to experience.

Youth is associated with limited job opportunities and job instability (Breen, 1992). In the case of Latin America (LA), the slowdown in population growth seen in the last two decades has had a favorable effect on youth employment (Weller, 2006; Fawcett, 2001). Brinton (2000) studies the social capital available to individuals through their own personal networks.

There are some variables that explain the youth unemployment as a decline in young people's level of education which has been advanced as a possible explanation for the higher rate of youth unemployment. However, Bell and Blanchflower (2010) find that young people in industrialized countries are more educated than they were before, and Bassi and Galiani (2009) and Weller (2006) report similar findings for Latin America. Another reason is the minimum wage laws that are popular in LA, that may, for example, discourage employers from hiring people in this age group. Neumark et al (2014) conclude that minimum wages in the United States have not reduced employment.

Their results reaffirm the evidence of disemployment effects; with teen employment elasticities near  $-0.15$ , they conclude, that minimum wages pose a tradeoff of higher wages for some against job losses for others.

The introduction of new technologies also tends to increase the demand for skilled labor, which could have an impact on the recruitment of young people (Dolado, Felgueroso and Jimeno, 2000). Another important variable, according to Tanveer et al (2012), are financial crises that have an impact on youth unemployment and goes beyond the impact resulting from GDP changes. The effect on youth unemployment, therefore, is greater than the effect on overall unemployment. Chung et al (2012) states that the recent global recession, and the general flexibilization of labor markets affects the young people, concluding that the new generation – with higher exposure to systematic labor market risks than previous generations – is being left to fend for itself with little appropriate state support. Dietrich (2013) tested the ratio of youth unemployment to the corresponding adult rate, and found it to have increased in the 2000s until 2008. In the years of crisis, however, this ratio stagnated or even decreased slightly. Generally speaking, the development of this ratio seemed only to be weakly connected to the business cycle in the 2000s.

Zanin and Prometeia (2014) investigated Okun's law in OECD countries by examining estimates for male and female age cohorts for the period 1998-2012. They found that the young population, and particularly the young male population, tends to be most exposed to the business cycle in both developed and emerging OECD countries.

Simmons et al. (2013), based on findings from a longitudinal study of 20 young people who have spent significant periods of time as NEET (Not in Education, Employment, or Training). Drawing on three years of ethnographic research conducted across two local authorities in the north of England, it focuses on the life experience of a set of young people as they move between various sites of exclusion and participation in the labor market. Central to the paper are the experiences of three individuals and their attempts to begin work in the retail, care and catering industries. The paper illustrates a range of tensions between the aspirations of young people and the opportunities open to them. It provides a critical insight into some of the conditions which characterize work on the fringes of the labor market and the interplay between these and the attitudes, values and dispositions of the young people taking part in the research. The paper's findings challenge popular discourses about young people on the margins of participation and pose questions about the articulation between education, work and training for those seeking to enter the labor market.

Yip and Wong (2014) shed light on the role of aggregate fertility as a form of statistical discrimination against young working women in the labor market; the study provides unequivocal evidence that age-specific fertility rates exert a negative impact on female wages.

## Literature review

“Job shopping” is the mobility between jobs, based on uncertainty and imperfect information (see Johnson 1978). In theory, job transitions are voluntary, because they are taking advantage of the stage in their working lives when the opportunity cost is low to move from one occupation to another in search of better options (Neumark, 2002).

Young people are often employed in low-productivity activities in which the opportunities to gain expertise in a given area are much more limited (Maurizio, 2011). Oliveira et al (2011) in their research, analyzed precarious work among the young people in 27 EU member states. They conclude that the generation of young adults (15-24 years) is by far the most affected by temporary employment in all EU countries without exception and, specifically, in Spain, Germany, Portugal, Sweden and France. A temporary work will show a duality in the juvenile temporary work. Temporary work is classified as either an option or a constraint. In the first case, the negative weight associated with the precarious situation can be diluted and the precariousness of employment only really poses a problem for young people entering a working life with expectations to build a professional future.

Jimeno-Serrano et al (2000) examined a combination of an increase in the relative supply of higher educated worker and rigid labor market institutions which harms the training and labor market prospects of lower educated workers, while it raises the proportion of higher educated workers performing low-skill jobs. Morsy (2012) argued that for young people it has always been costly to find work. Historically, the rate of unemployment for the age group of 15-24 years in the advanced economies has been double or triple as compared to older age groups, and if they do not find their first job or if they cannot keep it for long, their lives and career prospects can be impaired in the long term. However, youth unemployment also has social implications and contributes greatly to the growing income inequality in the advanced economies.

Parente et al (2014) analysed the structural changes of youth employment aged between 15 and 24 years of age, with compulsory basic education (ISCED 0-2) in 1988, 1998 and 2007.

Based on the unpublished data from Quadros de Pessoa (Labor Census - Public sector excluded) of the Ministry of Employment and Social Solidarity. The exploration of variables such as contract, seniority, working hours, and remuneration, allows configuring an autonomous labour market of juvenile manpower with regard to the general labor market. It concludes by arguing that schooling is a key differentiator of the employment relation of less educated young people apropos the higher educated ones.

Corrales y Rodriguez (2014) states that for some people, a part-time job is merely an intermediate state that serves as a stepping stone to further employment and makes the labor market integration easier. Yet, part-time work also appears in highly unstable careers. The present research aims to determine the role of part-time employment for young people with non-university studies. Using the Survey on Transition from Education/Training and Labor Market Integration (ETEFIL-2005), we built the monthly sequence of labor states for young people from when they had finished their non-university studies until the time of the survey. The analysis allows us to conclude that part-time work is fairly atypical in the early stages of a career but that those who have part-time jobs spend quite a long time in them. In addition, we identified several patterns in the use of part-time work, the 'integrative' pattern proving to be the most prevalent. Factors such as education and early preferences are seen to have a major impact on career paths.

Potestio (2014) assessed the effectiveness of a reform of the higher education system aimed at stimulating employability and faster access to the labor market for Italian graduates. Using the Taylor formula, the evolution of the employment rates has been followed through the movements and interaction of activity and unemployment rates.

The progress in the level of educational attainments has not been accompanied by a true reversal of the weaknesses within the Italian youth labor market. Two main results emerge. First, delayed entry into the Italian labor market remains a peculiar characteristic of young graduates. Second, a comparison within the 25-29 age group reveals weaker results among first-level graduates.

Mroz and Savage (2006) said that involuntary youth unemployment may yield suboptimal investments in human capital in the short run. Their theoretical model of dynamic human capital investment predicts a rational "catch-up" response; they also find evidence of persistence in unemployment. They found that unemployment experienced as far back as ten years ago continues to affect their earnings adversely despite the catch-up response.

De Lange et al (2014) states that young people in Europe face great difficulties nowadays when entering the labour market. Unemployment and temporary employment are high among youth, although considerable differences exist between European countries. In this article, we study as to what extent the cyclical, structural, and institutional factors explain cross-national variation in the youth labour market integration. In addition, we examine educational differences in the impact of these macro-characteristics. To answer these questions, we use data on young people from 29 countries who were interviewed in the European Social Survey of 2002, 2004, 2006, or 2008 and left day-time education in the period 1992-2008. Both, unemployment and temporary employment, are regarded as a lack of labor market integration, compared to the situation of permanent employment. The empirical results first show that high unemployment hinders young people from smoothly integrating into the labor market. Conversely, economic globalization positively affects youth labor market integration.

We also demonstrate that young people experience fewer difficulties with labor market integration as the educational system is more vocationally specific. Those in the intermediate and higher educated categories particularly profit from the positive effect of the vocational specificity of the educational system. Finally, as the employment protection legislation of incumbent workers is stricter, young people experience more difficulties with labor market integration, especially the higher educated youth.

Kramarz and Skans (2014) opine that the conditions under which young workers find their first real post-graduation jobs are important for their future careers and insufficiently documented given their potential importance for young workers' welfare. To study these conditions, and in particular, the role played by social ties, they use a Swedish population-wide linked employer-employee data set of graduates from all levels of schooling that includes detailed information on family ties, neighborhoods, schools, class composition, and parents' and children's employers over a period covering years with both high and low unemployment, together with measures of firm performance. They found that strong social ties (parents) are an important determinant for where young workers find their first job. The effects are larger if the graduate's position is "weak" (low education, bad grades), during high unemployment years, and when information on potential openings are likely to be scarce. On the hiring side, by contrast, the effects are larger if the parent's position is "strong" (long tenure, high wage) and if the parent's plant is more productive. The youths appear to benefit from the use of strong social ties through faster access to jobs and by better labor market outcomes as measured by a few years after entry.

In particular, workers finding their entry jobs through strong social ties are considerably more likely to remain in this job, while experiencing better wage growth than other entrants in the same plant. Firms also appear to benefit from these wage costs (relative to comparable entrants) starting at a lower base. They also benefit on the parents' side; parents' wage growth drops dramatically exactly at the entry of one of their children in the plant, although this is a moment when the firm's profits tend to be growing. Indeed, the firm-side benefits appear large enough for (at least) small firms to increase job creation at the entry level in years when a child of one of their employees graduates.

Carmo et al (2014) state that the European and Portuguese labor markets have undergone significant changes in recent years. The high rates of unemployment have been accompanied by precarious employment – a phenomenon that is affecting younger people the most. This article analyzes how the future employment prospects of young people with few qualifications and/or on low pay, are both represented and projected. By means of a content analysis of 80 interviews with young working people in Portugal, two forms of projecting their professional future were defined: the cumulative and the noncumulative projections. Within the latter category, three subtypes were identified: those of contingency, immobility, and rupture. These categories are systematically explained, considering the notion of time as a sociological variable.

Abdih (2011) states that unemployment in the Middle East is primarily a youth phenomenon. Young people (aged 15 to 24 years) represent 40% or more of the unemployed in Jordan, Lebanon, Morocco and Tunisia, and nearly 60% in Syria and Egypt. The rate of youth unemployment in these countries was 27% on average in 2008 than that of any other region.

These levels of unemployment have substantial economic and social costs, and in part due to the lack of labor prospects, a large number of people have migrated abroad.

Latin America

In Latin America, the situation of the youth labor market is different. Cacciamali (2005) calculated that youth unemployment in Argentina, Brazil and Mexico is two or three times that of adults, and the difficulties tend to increase among those whose level of education is lower. This is especially so in the lower-income families where young people with less schooling present a large percentage of youth who neither participate in education nor in the labor market. Employment prospects are good for those with better qualification and exclude unskilled youths. In these three countries, there is a high probability of maintaining a cycle of reproducing intergenerational poverty.

A successful entry in the labor market depends on the sharp inequalities that mark young people's opportunities for human and social capital formation (Weller, 2006). In addition, Weller (2007) examined that the employment status of the youths was worse in absolute terms along with the deterioration of the general labor market. He also noted great heterogeneity in the working conditions, depending on the level of education, gender and household characteristics. His research identifies a number of tensions between the subjectivity of the youths and the reality of the labor market.

Kilksberg (2008) argued that insecurity is one of the great problems of Latin America; the homicide rate has doubled since 1980 to reach levels that could be considered epidemic. The classic response was based on police and repressive approaches known as "hard hand" which.

By contrast, prevents differentiation between organized crime and criminal acts of excluded youth and hinders the development of policies that aim to address the issue in depth.

Tong (2010) said that before the crisis, the youth unemployment rate in the Southern Cone was the highest in all of Latin America. During the period 1997-2007, Central America, Mexico and the Dominican Republic recorded the lowest rate of youth unemployment in the region. The female youth unemployment rate for 2005 is 1.4 times higher than the male rate. This relationship held until 2008. Since 2008, countries that showed a moderate decline of GDP and a significant increase in youth unemployment were Brazil, Chile and Nicaragua. Mexico, in the meanwhile, posted a sharp drop in the real GDP in 2009 with significant impact on youth unemployment. In terms of intensity in the increase in unemployment, the countries most affected are Chile (8.5 percentage points), Colombia (7.5 pp), Peru (5.2 pp) and Mexico (5.1 p.p.). On the other hand, some of these countries are also the ones showing further decline in youth unemployment, with Chile (-4.6 percentage points) and Mexico (-2.2 p.p.). A recent study concludes that a person exposed to a recession between ages 18-25 years is more likely to believe that success in life is achieved by being more random (lucky) than through hard work (Giuliano and Spilimbergo, 2009).

In 2009, about 82,100 young people of ages 15 to 19 years, only found employment as casual employees. Of these, 51 were located in the informal sector enterprises and 25 jobs were not protected from formal enterprises. The difference corresponds mostly to young women with informal jobs in homes, mainly related to domestic work. Sex differences within the youth population are marked. In the case of young women aged 15-19 years.

Informal employment in informal sector enterprises has increased significantly from 39.2 percent in 2007 to 47 percent in 2009. This means that although there is an increase in the level of employment, the quality thereof has suffered. For men, informal employment increased by a 4 points percentage in the informal sector, an increase well below that of the women.

Viollaz (2014) found that the employment status of young people in LA had deteriorated over time until an improvement seen in the late 2000s. Although youth unemployment and informality rates are still very high, young people are entering into a typical employment cycle in which they are surpassing the results obtained by the adults of earlier generations.

## Mexico

De Oliveira (2006) studied the situation of labor precariousness of the young salaried population in Mexico at the beginning of the 21st century. In her study, she took into account socio-spatial, labor, family and individual aspects, and found that most young employees are introduced in the labor market in jobs that are characterized by being precarious in degrees ranging from moderate to very high. Only about a third of them do not indulge in precarious activities or are involved in less precarious activities. Most young workers lack local labor contracts and benefits; their occupations are unrelated to their studies, and they work excessive hours at for very low incomes. The oldest young workers, 25 to 29 years old, have a workplace, labor contracts, perform activities related to their studies, work part-time most of the days and earn higher hourly wages. They come from families with greater financial resources, having a career or graduate studies or in occupations as officials, managers, professionals and technicians.

Canovas and Amador (2007) analyzed the various stages of: leaving school, first job, leaving the parental home, first union and first - born child. Young Mexicans do not finish their studies before starting work; instead, their first transition entails entering the job market. Likewise, although the majority leaves the parental home to marry or to live with someone, some still live with their parents even though they are married and have children. The time it takes for young people to make the transition to adulthood, when living in a restrictive environment, accelerates the occurrence of these five events. Conversely, communication with one's parents and a better financial situation delay their occurrence.

Abril-Valdez et al (2008) analyzed the scholar drop out, and their results indicated that 86% of the surveyed students abandoned high school between the first and the third semester. Their grade average during the last semester studied was 7.49. The main reasons of the desertion of these students were: economic factors, failure in some subjects, and the lack of interest in their studies. Of the total participants in the study, 93% were not satisfied with the academic level they had reached.

Saravi (2009) provided in his book a detailed analysis of the family and residential transitions, school and entering the labor market, the crisis of integration institutions, stigma and urban segregation, the risk factors that threaten vulnerable young people, as well as the perceptions and experiences of falling into exclusion. An awareness of vulnerable transitions regarding the problems and dilemmas is prevalent among the youth in underprivileged areas of Mexico, a paradigmatic example of which can be found in other large urban centers in Latin America.

Botello-Triana (2012) stated that for the period 2000-2010, unemployed youth numbered approximately 970,000 people, 59.4% of who suffered from total unemployment. During the period 2000-2008 the relative growth of young migrant population, in this case 15 to 29 years, reduced from 32% in 2000 to 46% in 2008. On an average in the period 2000-2010, the population NEET amounted to 1.2 million people, of which 46% were male and 54% female; the highest annual increase was observed in 2005, increasing by 28.5% overall; 22.5% for men and 33.8% for women.

Vargas-Valle and Cruz-Piñero (2014) found that the odds of searching for employment were considerably higher among unprotected workers than among those with social protection. Non-working males registered higher odds of searching for employment than unprotected workers, while non-working males exhibited similar odds of job search than those female workers without social protection. The search for employment of young males was higher in the southern regions, which are characterized by a low supply of jobs with social protection. Their results support the idea of a high level of job search among young workers in low-quality jobs.

Ramirez-Baca (2014), who identified the existence of the phenomenon of informal dualism in Mexico, acknowledged the presence of two informal groups in the segmented youth labor market and concluded that informality is heterogeneous.

Raja and Zsekely (2015) made a simultaneous analysis of the influence of individual-family, community, and macro factors, on the upper secondary education dropout numbers in Mexico.

Their results about the labor market were that the consequences of dropping out are the inability to pursue higher education, which has the highest economic returns, to reduced opportunities for securing employment, access to lower wages, and higher levels of informality. Drop out, in the long run, includes having a head of household being unemployed and a low household income. Yaschine (2015) concluded that education is the factor that most affects the status of young people in the labor market, but those factors related to their social origin have, on the whole, an effect of similar magnitude. Additionally, differences in gender and migration status that highlight the importance of the characteristics of the context and labor markets were observed.

Bermudez-Lobera, J (2014) states that people between 15 to 29 years old who are Not in Employment, Education or Training (NEET), are not a homogeneous group but have different characteristics as life trajectories. Also, NEETs are not just the result of economical exclusion but the product of how society assigned gender roles.

Garcia et al (2015) identified four issues in NEET people: a) perception of themselves, b) through your path of life; c) identity references; and d) life goals. The results of the comparison revealed fairly homogenous cultural life goals and difficulties into work or school, which is explained by a common construction process and the search for social insertion. Differences show different perceptions on the current situation and the apparent initial construction of this phenomenon.



## Migrants to USA

Cornelius et al (2009), in their book which is a follow-up to *Mayan Journeys*, drew on responses to more than 1,000 surveys and some 500 hours of in-depth interviews in both the Yucatán and the US. The authors document the economic coping strategies of migrants and their families, how migrant workers navigate the US job market, and how health, education, and community participation are being shaped by the ongoing economic crisis. A groundbreaking chapter explores how a "youth culture of migration" develops in a migrant sending community.

Fusell (2004) opines that there are three distinct sources of Mexico-U.S. migration flow: the oldest stream from rural communities in central western Mexico, an incipient stream from interior urban areas, and a small but steady stream from Tijuana, a northern border city. Using the Mexican Migration Project data with an expanded geographic coverage, I identified these streams and examined how the differences in the origin community in terms of family-based migration-related social capital, internal migration experience, and labor force participation shapes the likelihood that men in the community initiate and continue migratory trips. I found four patterns of Mexican migration that make up the flow from central Mexico to northern Mexico and the U.S.: (1) the well-established flow of mostly undocumented low-skill agricultural labor migrants originating in the rural areas of central western Mexico and moving directly to the U.S.; (2) a newer stream of mostly undocumented U.S.-bound migrants from urban interior communities with a greater range of human capital; (3) internal migrants who move to Tijuana as a final destination, and (4) career migrants who make Tijuana a home base for making repeated, mostly undocumented, trips to the U.S.

Marquez (2007) analyzed a remittance-based development model. He reviewed: the export of cheap labor; the role of labor migration in US productive reconstruction, and the function assigned to remittances in the Mexican economy. He concluded that development based upon remittances intensifies the dependence on them, yet is not linked to mechanisms that promote local, regional or national development. Alarcon et al (2009) said that Mexicans constitute the largest immigrant group in the United States, accounting for nearly a third of all immigrants. In volume, they are followed far behind by those from China, Philippines and India (Alarcon, 2007). In 2007, there were 11.7 million people living in the United States who were born in Mexico, 62% of these people live in homes of families with married couples and 47% live in homes that are owner-occupied. These data suggest that the Mexican immigrant population in the United States has a large component of families settled there. Hernandez et al (2015) states that nowadays, it is estimated that over 11 million people born in Mexico are residing in the USA, of which 90% are concentrated in the states of California, Texas, Illinois and Arizona. The reasons for this immigration are: the persistent demand for Mexican labor in USA's agricultural, industrial and service sectors; the wage differential between the two economies; the intense pace of population growth in the working age population; insufficient dynamics of the Mexican economy to absorb surplus labor force, and the tradition of migration to the USA. As for receiving remittances, Mexico has the third place in the world behind China and India. Castañeda-Camey (2014) states that there are two imaginaries of young people with regard to employment: one is made up of the economic and educational expectations and, the second is made up of desires, illusions and expectations from the affective and emotional outlooks, such as family reunification and the consolidation of a couple's life.

Morales (2015) briefly presents the participation of Mexican women in the migration process as labor migrants who are part of a new migratory pattern different from the traditional family reunification, identified in the migration of Mexicans to the United States. But the expectations of the young living in the USA are difficult as it was for their parents. As Abregoa and Gonzalez (2010) stated in their study, undocumented youth are growing up with legal access to public education through high school but facing legal restrictions and economic barriers to higher education and the workforce. Every year, about 65,000 undocumented students graduate from high school nationwide. Like other children of immigrants, they plan to remain in the United States, but these young men and women have few means out of poverty, and are a vulnerable population at risk for poverty and hardship. They concluded that, if given opportunities to pursue higher education and work legally in this country, these bilingual, bicultural students would benefit the U.S. taxpayers and the economy overall.

### Data and econometric results

In year 1930, there were 2.3 million people speaking 85 different native languages. They represent 16.6% of the total population; by 2010 they were 6.6 million and only 6.5% of the total population. In 2010, there were four states in the south of Mexico with 15% or more of their total population that speaks a native language, Oaxaca with 30%, and Chiapas, Yucatan and Quintana Roo with 15%.

Year	Total population	People speaking a native language (millions)	%
1930	14 028 575	2.3	16
1950	21 821 032	2.4	11.2
1970	40 057 728	3.1	7.8
1990	70 562 202	5.3	7.5
2000	84 794 454	6.3	7.1
2005	90 266 425	6	6.6
2010	101 808 216	6.6	6.5

**Table 1** Population five years old or more

Source: INEGI. Censo, 1930, 1950, 1970, 1990, 2000, II Conteo de Población y Vivienda 2005, and 2010

First, the occupied youth (14-24 years old) population is divided in two groups: one that speaks a native language and another which does not. The variables used in this research were: income defined as the percentage of youth that earn between 1.5 and 2 minimum salaries, enough to leave extreme poverty; the mean was 17.8% for indigenous youth and 25.07% for non-indigenous youth. High school is the percentage of youth that finished secondary education or half high school in the Anglo system. Of these, 19.85% were indigenous youth and 31.28% non-indigenous. The percentage of youth that work in industry, was 24.9% for indigenous and 40.7% for non-indigenous. Sewer, is a social condition variable measured by people who have a sewer in their house, comprised 56.8% to indigenous and 88.6% for nonindigenous. Another social variable was insured, people who had social security in their jobs; of these 44.5% for indigenous and 53.7% for non-indigenous. See tables 2 and 3 (INEGI, Census 2010).

			Indigenous		
STATE	SEWER	INSURED	INDWORKER	INCOME	HIGHSCHOOL
Aguascalientes	97.7	63	24.38	16.25	26.8
Baja California	52.2	45.7	30.81	26.65	15.4
Baja California Sur	68.1	54.1	21.52	26.75	11.5
Campeche	47.6	62.6	26.13	8.04	27.1
Coahuila	95.6	64.7	36.43	22.49	39
Colima	96.4	43.5	12.92	19.77	19.2
Chiapas	55.2	43.8	8.73	2.12	13.8
Chihuahua	29.6	44.3	36.41	19.18	7.5
Distrito Federal	97.6	27.1	19.81	22.53	20.7
Durango	32.2	50.1	23.91	12.81	22.4
Guanajuato	74.1	47	33.52	20.13	18.9
Guerrero	38.3	38.7	24.49	6.37	12.1
Hidalgo	57.1	55.8	18.7	7.37	18.8
Jalisco	81.6	38	29.44	26.72	19.7
México	77.4	35.3	34.15	22.93	22.1
Michoacán	45	34.6	44.34	13.67	12.9
Morelos	78.8	37.4	23.13	26.37	13.7
Nayarit	46.2	56.8	21.16	11.99	17.8
Nuevo León	98	52.1	23.25	35.56	28.3
Oaxaca	52.5	39.2	18.62	6.01	18.1
Puebla	66.5	36.1	28.07	11.76	15.3
Querétaro	52.1	50.6	51.2	19.9	17
Quintana Roo	79.8	59.3	24.35	15.74	33.2
San Luis Potosí	38.2	52.8	16.5	8.13	21.4
Sinaloa	67.7	60.1	3.43	27.71	19.3
Sonora	36.7	54.4	22.09	27.22	25.6
Tabasco	91.6	47.1	14.68	8.82	50.6
Tamaulipas	91.9	64.3	29.88	29.22	49.4
Tlaxcala	82.2	43.9	55.72	21.15	16.9
Veracruz	40.7	45.2	13.75	5.96	20.7
Yucatán	52.8	60.2	38.48	12.59	18.9
Zacatecas	75	33.9	25.45	19.27	15.1

**Table 2** Percentage of total youth employed population  
 Source: INEGI.Censo2010

			Non-indigenous		
STATE	SEWER	INSURED	INDWORKER	INCOME	HIGHSCHOOL
Aguascalientes	97.8	69.1	46.2	30.02	31.9
Baja California	90.3	67.1	44.3	21.74	43.3
Baja California Sur	90.9	67.6	26.77	20.44	47.6
Campeche	82.2	63	24.12	12.3	35.4
Coahuila	94.7	71.3	51.98	28.36	35.2
Colima	98.4	71.8	24.85	22.14	34.7
Chiapas	79.4	44.4	15.14	6.38	24.6
Chihuahua	90.3	69.9	51.88	32.39	36
Distrito Federal	98.9	50.8	24.3	21.08	55
Durango	86.8	57.9	41.27	26.52	31.3
Guanajuato	89.6	57.7	44.08	22.02	26.8
Guerrero	73.2	40.6	25.46	13.96	29.8
Hidalgo	84.1	51.6	36.57	15.95	31.6
Jalisco	97.3	53.4	39.44	21.62	32.2
México	91.9	45.2	35.92	23.26	41.5
Michoacán	86.7	43.3	31.02	17.65	23.5
Morelos	93.9	50.5	31.99	21.68	35.5
Nayarit	93.6	64	22.17	20.05	34.9
Nuevo León	96.8	72.4	41.77	24.51	36.3
Oaxaca	69.4	44	22.29	10.02	28.6
Puebla	84.8	35.7	36.81	17.11	27.2
Querétaro	89.7	63.4	42.9	26.32	32
Quintana Roo	94.1	62.4	20.66	16.63	45.3
San Luis Potosí	78.8	60.5	30.92	17.4	32.4
Sinaloa	89.7	63.1	21.69	23.13	40.5
Sonora	87.4	67.1	36.71	26.12	43
Tabasco	94.4	57.7	19.43	11.52	44.3
Tamaulipas	87	68.6	41.41	29.21	42.5
Tlaxcala	93.5	51.5	50.38	19.55	33.5
Veracruz	81.5	46.5	21.08	12.22	34.3
Yucatán	75.3	61.1	36.43	16.4	34.3
Zacatecas	88.1	54.6	35.2	20.11	24.2

**Table 3** Percentage of total youth employed population  
 Source: INEGI.Censo2010

On average, in Mexico, in year 2010, 21.12% indigenous young workers had completed secondary education; for non-indigenous youth 30.40% have completed secondary education. With respect to income, 17.54% of indigenous youth receive about two minimum wages as monthly salary, while for non-indigenous people this percentage is higher (20.24%). This wage is what enables them to be above the extreme poverty line. About people that is working in the industrial sector, 26.11% of young indigenous were working in the industries. While 33.60% of non-indigenous young people were employed in industry, the benefit of having social security, which involves medical and unemployment insured and a retirement, the 73.44% of indigenous young workers do not have him and a little more than a half of non-indigenous youth, 58.14% had no social security. This data indicates that indigenous youth employed with a salary or wage in 2010 were at a disadvantage, because a smaller percentage of them had finished high school, close to two minimum wage salaries, a smaller percentage worked in industry and higher percentage of them have not have social security as compared to non-indigenous youth.

Dependent Variable: SEWER				
Method: Least Squares				
Sample: 1 64				
Included observations: 64				
White heteroskedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	64.85331	9.730262	6.665114	0
HIGHSCHOOL	1.415401	0.308612	4.586342	0
INSURED	-0.619759	0.262851	-2.357834	0.0217
B1*INSURED	0.85234	0.207741	4.102895	0.0001
B1*HIGHSCHOOL	-1.126247	0.360824	-3.121322	0.0028
R-squared	0.537588	Mean dependent var	76.98281	
Adjusted R-squared	0.506238	S.D. dependent var	19.94346	
S.E. of regression	14.01391	Akaike info criterion	8.192882	
Sum squared resid	11586.99	Schwarz criterion	8.361545	
Log likelihood	-257.1722	Hannan-Quinn criter.	8.259327	
F-statistic	17.14795	Durbin-Watson stat	2.612067	
Prob(F-statistic)	0			

**Table 4** Regression

Source: Own estimation

$$\text{SEWER} = 64.853 + 1.415\text{HIGHSCHOOL} - 0.619\text{INSURED} + 0.852\text{B1} * \text{INSURED} - 1.126\text{B1} * \text{HIGHSCHOOL}$$

$$t - \text{statistic}(6.66) \quad (4.58) \quad (-2.35) \quad (4.10) \quad (3.12)$$

$$R^2 = .537 \quad \sigma = 14.0139 \quad F - \text{statistic} = 17.147 \quad \text{Jarque - Bera(prob)} = 0.856 \quad (1)$$

### Youth indigenous

$$\text{SEWER} = 64.853 + 1.415 \text{HIGHSCHOOL} - 0.619 \text{INSURED} \quad (2)$$

### Youth nonindigenous

$$\text{SEWER} = 64.853 + 0.295 \text{HIGHSCHOOL} + 0.233 \text{INSURED} \quad (3)$$

Only 56.8% of indigenous youth with employment in Mexico, have drainage in their homes, whereas 88.8% of nonindigenous had drainage in their homes. This is an indicator of the prevailing social and health conditions, summarizing the degree of welfare and the social status of youth. In six states of Mexico, of the total indigenous young working people.

Only between 30 and 40% of them have drainage in their homes. These are Chihuahua, Durango, San Luis Potosi, Sonora and Veracruz. In addition to non-indigenous youth, this indicator is much better, because the states of Yucatan and Chihuahua have a lower percentage of young people living in homes with drainage, and exceeds 70%.

When performing the regression without dummy variables, we get the expected logical result of a positive relationship between the dependent variable and the two explanatory variables. However, by introducing a dummy variable of the differences of indigenous and non-indigenous, we obtain “equations (1)-(3)” that indicate that indigenous youth have a high positive correlation between high school and the percentage of those with drainage in their homes. that is, This indicates that when there is an increase of 10% indigenous youth who complete secondary and work, it is expected that 14% more of them have drainage in their homes, hence education has a high return on the quality of life of indigenous youth in Mexico. On the other hand, to have a job that has social security has a negative relationship with the housing conditions.

For non-indigenous youth, the relationship of housing conditions and the percentage of those who complete secondary education is positive, but only a 3% increase in those with drainage in the house when there is a 10% increase of young people who complete secondary education. Additionally, there is a positive relationship for those who get jobs with social security.

In order to improve social conditions of young workers in Mexico, it is essential for them to finish high school before joining the labor market. This will have a greater effect if they are indigenous.

The Jarque-Bera statistic performed in the residuals, did not reject the hypothesis of normal distribution of the residuals (Lo et al., 2014).

Collinearity tests					
Correlation matrix					
VARIABLE	HIGH SCHOOL	INSURED			
HIGH SCHOOL	1	0.581811			
INSURED	0.581811	1			
Coefficient Variance Decomposition					
Sample: 1 64					
Included observations: 64					
Eigenvalues	94.75217	0.243158	0.012703	0.00752	0.000126
Condition	1.33E-06	0.000517	0.009889	0.0167	1
Variance Decomposition Proportions					
	Associated Eigenvalue				
Variable	1	2	3	4	5
C	0.999999	1.11E-06	3.30E-09	1.76E-08	1.42E-10
HIGH SCHOOL	0.011378	0.922635	0.064677	0.00113	0.000184
INSURED	0.651164	0.286055	0.007658	0.05444	0.000685
B1*INSURED	0.268902	0.604594	0.076576	0.0489	0.001024
Eigenvectors					
	Associated Eigenvalue				
Variable	1	2	3	4	5
C	0.999608	0.020754	0.004957	0.01488	-0.01036
HIGH SCHOOL	0.003382	-0.601152	0.696373	0.11941	-0.37338
INSURED	-0.02179	0.285096	-0.204085	0.70707	-0.61371
B1*INSURED	0.011067	-0.327575	-0.510062	-0.52966	-0.59319
B1*HIGHSCHOOL	-0.013237	0.670523	0.461764	-0.4528	-0.36328

**Table 5** Colliniarity test

Source: Own estimation

Variance Inflation Factors			
Sample: 1 64			
Included observations: 64			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	86.05302	23.50401	NA
HIGH SCHOOL	0.046349	11.73128	1.511725
INSURED	0.044332	35.47478	1.511725

**Table 6** Variance inflation factor

Source: Owm estimation

We conducted a collinearity test with the Coefficient Variance Decomposition of an equation that provides information on the eigenvector decomposition of the coefficient covariance matrix. This decomposition is a useful tool to help diagnose potential collinearity problems amongst the regressors. The decomposition calculations follow those given in Belsley, Kuh and Welsch (BKW) 2004 (Section 3.2). Note that although BKW uses the singular-value decomposition as their method to decompose the variance-covariance matrix, since this matrix is a square positive semi-definite matrix, using the eigenvalue decomposition, it will yield the same results.

The top line of the table shows the eigenvalues, sorted from the largest to the smallest, with the condition numbers below. Note that the final condition number is always equal to 1. One of the five eigenvalues have condition numbers smaller than 0.001, without considering the constant, with the smallest condition number being: 0.000517, which would indicate a small amount of collinearity. The second section of the table displays the decomposition proportions. The proportions associated with the smallest condition number are located in the first column. One of these values is larger than 0.5, again without considering the constant. This indicates that there is a low level of collinearity between those four variables.

The variance inflation factor estimates how much the variance of a coefficient is “inflated” because of linear dependence with other predictors. Thus, a VIF of 1.8 tells us that the variance (the square of the standard error) of a particular coefficient is 80% larger than it would be if that predictor was completely uncorrelated with all the other predictors.

The centered VIF has a lower bound of 1 but no upper bound. Authors differ on how high the VIF has to be to constitute a problem. Alison (2012) said that we get concerned when a VIF is greater than 2.50, which corresponds to an R<sup>2</sup> of .60 with the other variables.

Thus, we conclude that our model has the proper characteristics of a good cross-section econometric model, after performing the above tests.

We then regressed a model with income as a dependent variable with independent variables: highschool, insured, sewer and indworker with the following results:

$$\text{INCOME} = 0.8329\text{HIGH SCHOOL} + 0.2233\text{ INSURED} - 0.4154\text{SEWER} + 0.2459\text{INDWORKER}$$

$$t - \text{statistic} \quad (3.304) \quad (4.521) \quad (-4.365) \quad (3.341)$$

$$R^2 = 0.315 \quad \sigma = 6.317 \quad \text{Jarque - Bera}(\text{prob}) = 0.125 \quad (4)$$

Equation youth employed in México

$$\text{INCOME} = 0.2233\text{ INSURED} + 0.2459\text{ INDWORKER} \quad (5)$$

Equation youth employed in four indigenous states

$$\text{INCOME} = .8329\text{ HIGH SCHOOL} + 0.2233\text{ INSURED} - 0.4154\text{ SEWER} + 0.2459\text{ INDWORKER} \quad (6)$$

In the results obtained in “equations (4)-(6)”, the relationship of income to jobs with social security is positive for all young workers from Mexico.

The same was the case having jobs in the industrial sector, i.e., a 10% increase in jobs with social security, with an increase of about 2% of young people who have access to two minimum wages and an increase of 2.5% when 10% of young people worked in the industrial sector; this happened for both, indigenous and non-indigenous. Thus, to have jobs with social security and being in the industrial sector increases for people with two minimum salaries.

An important difference was present in the states where there was a predominance of indigenous population: Oaxaca, Chiapas, Yucatan and Quintana Roo. The education variable in these states is important because they have greater elasticity, i.e., an increase of 10% of young employed people who have completed secondary schooling, increases 8% of young people who obtain wages equivalent to around two minimum wages. Similarly, in states where the young people are predominantly indigenous, if they get jobs with social security, they also have a positive relationship with income which means that a few more of them could get two minimum wages or a wage that brings them out of extreme poverty.

For predominantly indigenous states, the inverse relationship between the drainage in homes and poverty wages is important (two minimum salaries), because when you decrease the percentage of young people with housing drainage, it increases the number of them who earn two minimum wages. This is so despite adverse conditions in terms of housing, education and industrial jobs. It is, therefore, possible to have a greater number of young people out of extreme poverty, but it is very important to improve social and housing conditions in Mexico which alone would eliminate much of extreme poverty. Thus, not having drainage is not an impediment to better pay.

## Results and concluding remarks

We measured the de Moran index. Values ranged from  $-1$  (indicating perfect dispersion) to  $+1$  (perfect correlation), for the variable income for young indigenous people and with a weight matrix of vicinity of ones that is an empirical estimate of the spatial scale of association. The result was 0.38, Moran index, and we had a positive spatial autocorrelation. Spatial features and their associated data values tend to be clustered together in space, the term correlation alludes to the notion of 'redundant information'. If  $x$  and  $y$  are perfectly correlated, then knowing  $x$  means exactly knowing  $y$ . In other words, the information content of  $y$  is perfectly duplicated in  $x$ ; this degree of duplication decreases as the correlation coefficient moves toward 0, and so we had a weak spatial autocorrelation (Griffith, 2009). Thus, this result does not affect seriously our conclusions.

Indigenous youth have a high positive correlation between high school and the percentage of those with drainage in their homes. Thus, education has a high return on the quality of life of indigenous youth in Mexico. On the other hand, to have a job that has social security has a negative relationship with the housing conditions.

For non-indigenous youth, the relationship of housing conditions and the percentage of those who complete secondary education is positive. Additionally, there is a positive relationship for those who get jobs with social security.

We conclude that to improve social conditions of young workers in Mexico, it is essential that the majority of them finish high school before joining the labor market, and especially if they are indigenous, this will have a greater effect.

Nevertheless, it is also essential to take bilingual education, in order to preserve indigenous languages in Mexico.

To have jobs with social security and in the industrial sector increases the number of people with two minimum salaries.

In states where there is a predominance of indigenous population, the education variable is important because an increase in the number of young employed people who completed secondary education, increases the number of young people who obtain wages above extreme poverty; the same applies for people having jobs with social security. For young indigenous workers, not having drainage is not an impediment to better pay.

More complete and updated information and statistics about indigenous people in Mexico would be required in order to implement social policies to improve their lives.

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