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DO YOUTH UNEMPLOYMENT AND INFORMALITY LEAVE A SCAR? EVIDENCE FROM 8 LATIN AMERICAN COUNTRIES

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Do youth unemployment and informality leave a scar? Evidence from 8 Latin American countries^{*}

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Abstract This paper studies the relationship between youth labor market experiences and adult labor outcomes, in the short and long term. The analysis is conducted using pseudo-panel data for 8 Latin American countries, a region characterized by high unemployment and informality rates. The main findings indicate marked heterogeneities across countries, with some characterized by short-term blemishes while others by longer lasting effects. These results suggest that youth experiences are relevant to adult's working lives, but that the channels driving them are specific to each labor market. Therefore, a detailed description of these findings must place special emphasis on these heterogeneities.

Resumen Este trabajo estudia la relación entre la experiencia laboral de los jóvenes y los resultados laborales de la adultez, en el corto y largo plazo. El análisis utiliza un pseudo-panel para 8 países de América Latina, una región caracterizada por altas tasas de desempleo e informalidad. Los resultados muestran que para algunos países los efectos son de corto plazo mientras que tienen una mayor duración en otros, sugiriendo que la experiencia laboral de los jóvenes es importante en la vida adulta. Los determinantes de estos resultados son específicos de cada mercado laboral; su estudio detallado exige enfatizar en estas heterogeneidades.

JEL Classification: J24, J31, J64, O17

Key words: youth, unemployment, informality, scarring, Latin America

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1. Introduction

Previous research on the labor market outcomes for young individuals is suggestive that these workers tend to fare worse than adults. In particular, young workers earn lower wages, face higher unemployment and have less access to formal jobs (Freeman and Wise, 1982; Weller, 2007; Bassi and Galiani, 2009). These findings have generated substantial interest in determining whether these conditions have lasting effects into adulthood (usually referred to as 'scarring'), or whether they may only temporarily 'blemish' working lives (Ruhm, 1991).

Most of the scarring literature has focused on the consequences of youth unemployment, finding that prolonged exposure to unemployment is associated with higher future unemployment and lower wages (see Ellwood, 1982; Gregory and Jukes, 2001; Gregg, 2001; Gregg and Tominey, 2005; and Mroz and Savage, 2006). However, the unfavorable conditions faced by young workers are not necessarily limited to unemployment. For instance, most young workers begin their labor market experience in informal jobs (Hemmer and Mannel, 1989). These jobs have lower wages and are exempt from labor regulations and workplace benefits when compared to the formal sector (Maloney, 2004). Notably, while informality may be expected to be scarring based on these stylized facts, recent evidence has suggested that this sector may actually serve as some sort of informal job training. Therefore, early experiences in the informal sector need not harm an individual's career path in terms of employment prospects or wages (Bosch and Maloney, 2010; Cunningham and Bustos, 2011).

In this context, this study aims to obtain further evidence of the relationship between youth labor market experiences and adult outcomes by analyzing how unemployment and informality during youth (defined between ages 15-24) are related to adult unemployment, informality and wages. The estimates will provide empirical evidence on scarring from youth in a region where less available work has been carried out. This lack of evidence mostly responds to the requirement of long-term panel data to measure scarring. However, this information is not widely available in Latin America. This study proposes a suitable alternative, since the analysis may be feasibly conducted using pseudo-panels which track birth cohorts. The benefits from this approach include being able to use information from 8 countries, which account for 78 percent of the regional population, plus additional advantages over traditional longitudinal data. First, all surveys are homogenized to ensure the maximum level of comparability. Second, this approach allows following birth cohorts for the majority of their working lives (up to 25 years after youth), an advantage mostly unavailable in longitudinal data which is usually short-running due to attrition problems (Navarro, 2010). Finally, using pseudo-panels with many observations mitigates the threat of measurement error (McKenzie, 2004), and is useful when making international comparisons (Cuesta et al., 2011).

The main findings show that youth unemployment and informality do not seem to have generalized long-term consequences on adult outcomes when the average effect across adulthood is computed. However, the decomposition of this effect into short and long-term consequences reveals some patterns. Particularly, the analysis finds evidence of unemployment persistence and wage scarring for several countries as well as significant consequences of youth informality into adult informality. Since the pool of countries is ample, there is some heterogeneity in the estimates. For instance, youth unemployment and informality show evidence of short-term blemishes in some countries, and longer lasting consequences in others. These results suggest that youth experiences are relevant to adult's working lives, but the mechanisms behind these results and the consequences are specific to each labor market.

The rest of this paper is organized as follows. The next section reviews the available literature on the relationship between youth labor market experiences and adult outcomes. Section 3 introduces the data and estimation framework. Section 4 presents a descriptive

analysis of the main labor market trends for the selected cohorts. Section 5 tests for evidence of an empirical relationship between youth unemployment and informality on several adult labor market outcomes. The last section concludes by drawing together the findings and discussing their potential policy implications.

2. Literature Review

The school-to-work transition remains an important issue in developed and developing countries.¹ In general, this research suggests that early experiences in the labor market shape individuals' paths when they become full-time employed adults (Michael and Brandon, 1984; Nordstrom, 2011). In particular, the majority of studies have focused on the effect of job stability (or 'churning'), unemployment, and more recently, the type of employment into which young workers are generally inserted –formal or informal– on adult outcomes such as wages and employment (or unemployment) prospects.

Job stability during the initial years of employment and its consequences have been studied by Holzer and LaLonde (1999), who find that increased tenure has a positive short-term effect on employment for young workers, since instability usually declines as workers grow older. They argue that churning amongst young workers is mostly due to the difficulty of finding a proper employment match in the first job. In fact, Neumark (2002) suggests that the earnings gain associated with one additional year of experience for young workers lies between 7-13 percent for men and 12-24 percent for women in the US; which may reveal that obtaining a good match instead of shopping around has its advantages.

Several studies have also focused on the consequences of unemployment on future unemployment and subsequent earnings at all ages, with mixed evidence.² For instance, Ruhm (1991) initially found no evidence of unemployment scarring using data from the Panel Study of Income Dynamics (PSID) for all workers. However, Jacobson *et al.* (1993) do find that displaced workers present evidence of scarring and that this effect is relatively stable across the age locus. However, since unemployment is higher during youth, several authors have questioned whether scars from joblessness in this period are more relevant.

This research has found significant evidence of a relationship between youth unemployment and future labor market outcomes. However, Gregory and Jukes (2001) make the distinction that unemployment by itself is not the most relevant cause of lower future earnings, but unemployment duration. In particular, they find that a one-year spell implies a wage penalty of 10 percentage points for British men, which is also found by Gregg (2001). Fairlie and Kletzer (2003) estimate the (annual) wage loss from exposure to unemployment for men and women using the National Longitudinal Survey of Youth (NLSY) and they find that it is 9% and 12.5%, respectively. Gregg and Tominey (2005) find more pessimistic results: that longer spells of unemployment in Britain have a wage penalty of 9-21% up to twenty years later. Finally, Mroz and Savage (2006) find that early unemployment affects both future job displacement and earnings up to ten years after youth in the US.

On a more optimistic note, these studies also find some evidence of catching up of workers who had high unemployment during youth. However, the negative consequences from prolonged exposure in unemployment seem to outweigh the observed recovery. Hence, the available literature suggests that youth unemployment affects future labor market outcomes in a mostly negative manner, primarily for workers who queue for prolonged periods in unemployment during their early years in the workforce. Moreover, there is no catch-up effect

¹ See Ryan (2001) and Bradley and Nguyen (2004) for a review.

² See Arulampalam et al. (2001) for a review of unemployment scarring.

which leads to convergence between workers exposed to high unemployment during youth and those who were employed.

The scarring effects from youth are not limited to instability and unemployment. A series of recent studies have also begun to place attention on the effects of the first job held during youth. Mainly, this literature has focused on the effect of having an informal job on future employment prospects and wages. Young workers (mostly in developing countries), usually begin their labor market experience in informal jobs (Hemmer and Mannel, 1989). In theory, expectations would lead to assume that an initial employment experience in the informal sector may perpetuate informality and hinder future earnings, since the probability of migration to the formal sector is generally low as are the wages paid in that sector (Perry et al., 2007). However, the evidence remains inconclusive on this matter and has been identified as a key area for further research (Maloney, 2004). Some of the studies in this direction include Bosch and Maloney (2010), who find that the informal sector provides young workers with training and experience for better jobs that they could not obtain right out of school. Cunningham and Bustos (2011) support this claim, arguing that young workers are only temporarily employed in the informal sector and then move on to formal jobs once the premiums placed on health benefits and job stability increase as they establish families. Moreover, they find that initiating the labor market experience in the informal sector does not necessarily imply that workers will remain in that sector, at least not permanently.

In summary, the previous literature suggests that early labor market experiences matter. However, there are still some topics to address. First, while there is predominant evidence of scarring for developed countries, evidence for developing countries and mainly Latin America is less available. Youth experiences are particularly important in Latin America, since the population in this region is relatively young on average (Brea, 2003). Second, while informality may not be a significant concern in the US and OECD countries, Latin America has experienced a large increase of the informal sector in the last decades (Gasparini and Tornarolli, 2009). Third, the potential effects of youth insertion into the labor market are even more interesting in the aftermath of the global recession, which some argue may have lasting consequences on those currently entering the labor market (Bell and Blanchflower, 2010). This paper contributes to these discussions by analyzing unemployment and informality scarring for several Latin American countries and cohorts. The findings will provide evidence on the labor market experience of the youth and its future outcomes as adults, providing a backdrop to frame the potential effects of the current aggregate labor conditions in the region on those currently entering the labor force.

3. Data and methodology

3.1 Data

The estimates in this paper are drawn from a large database of household surveys, the Socio-Economic Database for Latin America and the Caribbean-SEDLAC (CEDLAS and World Bank, 2011), compiled and homogenized by CEDLAS (Universidad Nacional de La Plata) and the World Bank's LAC poverty group (LCSPP).³ These surveys have the advantage of being comparable between countries, since most of the variables are homogenized using the methodology in Gasparini (2011).⁴ For this study, a subset of surveys is selected, comprising

³ See < <u>http://sedlac.econo.unlp.edu.ar/eng/index.php</u>>.

⁴ The methodology aims to generate maximum homogeneity, although some surveys are not entirely comparable. In this paper, all variables used are comparable unless otherwise noted.

those with complete information on labor market variables such as informality⁵, employment status and wages since the 1980s.

This criterion leaves available information for 8 countries: Argentina, Brazil, Chile, Costa Rica, El Salvador, Mexico, Uruguay and Venezuela.⁶ The selection of countries reflects the diversity in the region, since it includes upper middle income countries such as Argentina, Chile and Uruguay, middle income countries as Costa Rica, Mexico and Venezuela, and countries characterized by lower income and higher poverty rates such as El Salvador (Gasparini *et al.*, 2007). Moreover, the labor market histories in each country are distinct and characterized by diverse regulations, institutions and policies (Duryea *et al.*, 2003), which makes the selection of countries an interesting opportunity to capture the diversity across these labor markets. Table 1 lists the specific surveys used in the analysis. As shown in the table, they were pooled in six time periods (when information was available), spanning from the Early 1980s to the mid-late 2000s.⁷ Thus, this framework provides the opportunity to assess both short and long term consequences of youth labor market experiences.

						-					
Dariad		Countries									
Fellou	Argentina	Brazil	Chile	Costa Rica	El Salvador	Mexico	Uruguay	Venezuela			
Early 1980s	1980	1981-1984	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.			
Late 1980s	1986, 1988	1985-1989	1987	1989	n.a.	1989	1989	1989			
Early 1990s	1991-1994	1990, 1992- 1993	1990, 1992, 1994	1990-1994	1991	1992	1992	1992			
Late 1990s	1995-1999	1995-1999	1996, 1998	1995-1999	1995, 1996, 1998, 1999	1996, 1998	1995-1999	1995, 1998, 1999			
Early 2000s	2000-2004	2001-2004	2000, 2003	2000-2004	2000-2004	2000, 2002, 2004	2000-2004	2000-2004			
Late 2000s	2005-2009	2005-2008	2006, 2009	2005-2009	2005-2008	2005-2006, 2008	2005-2009	2005-2006			

Table 1Countries and surveys in the sample

Source: SEDLAC (CEDLAS and the World Bank, 2011) n.a.: Not available

Since repeated cross-sectional data tracks cohorts and not individuals, Table 2 defines the selected cohorts and describes their aging process throughout the timeframe. The first cohort is comprised of individuals born in the Early 1960s (1961-1965), who are aged 20-24 in the first available survey (Early 1980s). The second cohort contains individuals born in the mid and late 1960s (1966-1970) who are aged 15-19 in the earliest data. The following two cohorts are defined in the same manner as more data become available. Youth is defined as ages 15-24, and adulthood as 25 or older. To avoid potential biases from individuals still in school, the sample does not include those who are still attending formal education, who do not earn wages and individuals with incomplete or invalid data on the variables of interest.⁸

⁵ We use the legalistic perspective of informality and classify a worker as informal when he does not possess the right to receive a pension linked to his employment when retired.

⁶ While all countries in the region are not included due to informational availability, the selection used here represents 78 percent of the overall population in Latin America according to population estimates in 2009 (WDI, 2009). This high representativity is mostly driven by the inclusion of two countries: Brazil and Mexico.

⁷ Since some countries did not implement surveys until the 1990s, there are some cases which only allow assembling the pseudo-panel data beginning in this decade. However, while there are less time periods, the analysis still allows tracking the youngest cohort for 20 years after their initial labor market experience.

⁸ Due to space restrictions, the tables with observations by cohort and time period are not presented. Nevertheless, the number of observations with valid information ranges from approximately twenty thousand in Argentina to over one million in Brazil.

Cohort definitions and aging patterns, all countries										
Cohort	Birth period	Aging pattern								
		Early 1980s	Late 1980s	Early 1990s	Late 1990s	Early 2000s	Late 2000s			
Cohort 1	1956-1960	20-24	25-29	30-34	35-39	40-44	45-49			
Cohort 2	1961-1965	15-19	20-24	25-29	30-34	35-39	40-44			
Cohort 3	1966-1970		15-19	20-24	25-29	30-34	35-39			
Cohort 4	1971-1975			15-19	20-24	25-29	30-34			

Table 2 ohort definitions and aging patterns, all countries

Source: SEDLAC (CEDLAS and the World Bank, 2011)

This data allows identifying whether the experiences of each cohort during their youth show evidence of lasting impact on adult labor market outcomes. Certainly, while observing trajectories on individual-level panel data would be ideal, the availability of this kind of information in the region is limited. In turn, cross-sectional data are recollected periodically in most Latin American countries, regularly twice a year or at least annually. Therefore, repeated cross-sections present a unique opportunity to study the dynamic process of scarring from youth experiences in Latin America.

Furthermore, using this data provides several advantages over traditional panel data (see Navarro, 2010). First, in a long-term analysis, longitudinal data has the common problem of sample attrition since it is difficult at best (and costly) to track individuals for long periods of time. In this paper, scarring is evaluated across the entire adult life and also by short and long term periods (between 5 and 25 years after youth). Second, repeated cross-sections provide more stability for analyzing long-term outcomes, omitting biases due to transitory shocks and short-run movements. Finally, employing a time series of cross-sections is ideal when performing international comparisons (Cuesta *et al.*, 2011), one of the objectives of this paper.

However, using repeated cross-sections also has several limitations. On the one hand, pseudo-panels do not provide information on intra-cohort dynamics (Deaton, 1997). On the other hand, since using this data implies estimating relationships at cohort level, this aggregation may be a potential source of bias. However, this may not pose a significant issue here, since cohorts are tracked for a long period of time and the assumption that events like migration and death do not alter the representativeness of each of the independent survey samples seems likely to hold. Additionally, measurement error falls with a higher number of observations (McKenzie, 2004), and the constructed data has no less than 20000 observations. Nevertheless, in the extreme case of measurement error and other potential confounding factors in the data, the estimates will be biased downward, and –in a worst case scenario– may be interpreted as lower bounds of the relationship between youth experiences and adult labor market outcomes.

3.2 Methodology

This data is used to obtain parameter estimates of two youth labor market outcomes unemployment and informality- on diverse adult outcomes. Since the data allows tracking cohorts and not individuals, youth labor outcomes are captured by the average level of unemployment (informality) faced by each cohort during their youth (ages 15-24), which is then imputed to adult workers belonging to each cohort.

Since the analysis aims to empirically determine both evidence of scarring in terms of persistence and wage penalties, there are two models which must be defined. On the one hand, persistence implies that a certain outcome (e.g. adult unemployment) is correlated with its past level (in this case, youth unemployment). Therefore, this process may be described as follows:

$$y_{ict} = \alpha + \beta \overline{y}_c^{youth} + \theta X_{ict} + \mu_c + \varphi_t + \varepsilon_{ict}$$
(1)

where y_{ict} represents observed adult outcomes for individual *i* belonging to cohort *c* at time *t* (e.g. unemployment or informality), X_{ict} is a matrix of individual time-varying covariates to control for changes within cohorts and ε_{ict} is an error term with mean zero. μ_c is a fixed effect by cohort and φ_t are time effects which control for aggregate trends. In this process, β captures the effect of persistence due to the average level of youth unemployment (or informality) for cohort *c*, (denoted by \overline{y}_c^{youth}).

Equation (1) depicts a dynamic process in which current labor market outcomes depend on the conditions experienced during youth. For instance, an application of this model captures how past unemployment (informality) affects current unemployment (informality). However, since the analysis also aims to determine evidence of wage scarring from youth experiences, the following regression will also be estimated:

$$\ln w_{ict} = \alpha + \delta \overline{y}_c^{youth} + \theta X_{ict} + \mu_c + \varphi_t + \varepsilon_{ict}$$
(2)

where the main departure from (1) is the change in the dependent variable. This relatively standard wage equation captures the effect of cohort-specific youth experiences on current wages. Hence, the estimate of δ captures scarring effects on wages from unemployment or informality during youth.

Note that in (1) and (2), the analysis assumes that youth labor market experiences have an average effect over the entire adult life. This is a simplifying assumption, since it is possible that while youth experiences may have no effect when considering an individual's entire adult life, they may temporarily blemish labor market outcomes. Therefore, the setup needs to be expanded to include potential heterogeneities across the life cycle. A categorical variable B_i is created to capture these potential blemishes across adulthood. This variable has 5 categories (indexed by *j*) which denote the passage of time: 5, 10, 15, 20 and 25 years after youth. In the above setup, indicator variables for each of the categories (b_i^j) are interacted with cohort-level youth unemployment (informality) to estimate the following regressions:

$$y_{ict} = \alpha + \beta \overline{y}_c^{youth} + \sum_{j=1}^5 \lambda^j b_{ict}^j \overline{y}_c^{youth} + \sum_{j=1}^5 \pi^j b_{ict}^j + \theta X_{ict} + \mu_c + \varphi_t + \varepsilon_{ict}$$
(3)

for unemployment and informality persistence, and:

$$\ln w_{ict} = \alpha + \delta \overline{y}_c^{youth} + \sum_{j=1}^5 \lambda^j b_{ict}^j \overline{y}_c^{youth} + \sum_{j=1}^5 \pi^j b_{ict}^j + \theta X_{ict} + \mu_c + \varphi_t + \varepsilon_{ict}$$
(4)

for wage scarring.

The sum of the estimates of β (or δ) with each of the λ^j provides an indication of the short and long term consequences of youth experiences on adult outcomes to determine whether youth unemployment and informality represent temporary blemishes or if the effect is observed many years later.

Equations (1)-(4) will be estimated separately for each country in the sample to capture the specificity of each country's labor market. For (1) and (2), since the main explanatory variable varies by cohort, the variance for the parameters of interest is obtained using robust heteroskedastic methods and clustering by cohort cells to prevent underestimation of standard errors and wrongful inference (see Donald and Lang, 2007). In (3) and (4), since the main explanatory variable is interacted with an indicator variable at the individual level, the correct variance specification does not need to be clustered at cohort-level, but does account for heteroskedasticity. Finally, while some of the outcome variables are binary, the analysis estimates all regressions using OLS, since the conditional expectation function does not vary significantly when using discrete models and also because of its ease of interpretability.⁹

The estimates from the above framework are expected to identify the relationship between adult labor market outcomes and youth labor market experiences on average and at different points in the life cycle. Nevertheless, while the above framework does provide some empirical relationship on the direction and significance of youth labor market experiences on adult outcomes, by no means does it provide a causal effect. However, these estimates do capture the direction and significance of the correlation between the variables of interest for each of the countries in the sample, which (to our knowledge) has not been conducted for the 8 countries used here.

4. Youth labor market outcomes in Latin America: A descriptive analysis

Before moving on to the main results, the analysis observes the evolution of labor market outcomes for the selected cohorts.¹⁰ The trends and patterns are drawn from regional averages, which are obtained by weighting each country's indicators by their population ratio in the region. Since several yearly surveys are pooled into a single time period, the analysis selects one of the years to calculate these weights (Table 3).¹¹

⁹ The binary regression results (by probit) and marginal effects are available upon request, although the results do not significantly differ from those presented here.

¹⁰ A cross-sectional assessment of labor market trends for young workers in Latin America may be found in Bassi and Galiani (2009).

¹¹ In particular, the statistics are not sensitive to defining a different base year to obtain the weights.

Years used as weights for aggregate statistics												
Period -		Years used to calculate weights										
	Argentina	Brazil	Chile	Costa Rica	El Salvador	Mexico	Uruguay	Venezuela				
Early 1980s	1980	1982	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.				
Late 1980s	1988	1987	1987	1989	n.a.	1989	1989	1989				
Early 1990s	1992	1992	1992	1992	1991	1992	1992	1992				
Late 1990s	1997	1997	1996	1997	1998	1998	1997	1998				
Early 2000s	2003	2002	2003	2003	2003	2002	2002	2002				
Late 2000s	2006	2006	2006	2006	2006	2006	2006	2006				

Table 3Years used as weights for aggregate statistics

Source: SEDLAC (CEDLAS and the World Bank, 2011)

n.a.: Not available

The regional averages for the selected outcomes are presented in Table 4 in the Statistical Annex. Additionally, the same information is plotted in Figures 1 through 6. Figure 1 presents the trends in labor force participation for each of the four cohorts. In general, the evidence points to falling labor supply across generations for younger individuals, which is consistent with the trend of delaying entry into the labor market to remain in school (Duryea *et al.*, 2003). However, labor supply seems to increase at a faster rate for younger cohorts once they complete the schooling process and make the full transition into employment (i.e. there is some 'catching-up'). A plausible explanation for this growth is the increasing participation of females in the labor market, since male supply has remained relatively stable as Bassi and Galiani (2009) find. Figure 2 presents the evolution of employment, which reflects similar patterns as for labor supply.

Figure 3 plots the unemployment rate by cohorts. Unemployment seems to be higher for the youngest cohorts, almost twice as large. Furthermore, the less encouraging unemployment situation of more recent generations does not show signs of catching-up as in the case of labor supply. Thus, this higher observed level of unemployment continues into adulthood. In fact, calculating the unemployment ratio between the fourth cohort (youngest) and the first (eldest) shows that unemployment is at least one-third higher for the youngest cohort. Furthermore, this ratio remains unchanged until the mid-late 2000s, which represents approximately 20 years after youth. This empirical finding is further confirmed when analyzing unemployment duration (Figure 4). In the youngest cohort, the average spell of unemployment was 10 months during ages 20-24. For the eldest, the time spent seeking a job in this age range was only half. As with the unemployment rate, unemployment duration has also increased across each successive cohort, especially during youth.

Labor informality presents an upward pattern across cohorts similar to the one observed for the unemployment rate (Figure 5). For the youngest age groups, this effect seems to be derived from the rising levels of informality observed in the 1990s (described in Gasparini and Tornarolli, 2009). Table 4 shows that at least 62 percent of workers are employed in the informal sector during ages 15-19. However, there is an important reduction in informality rates as workers age. The proportion of informal jobs decreases during ages 20-24, and continues to fall until settling around 30 percent of workers in adulthood.

Finally, the evolution of hourly wages is shown in Figure 6 (wages are expressed in US\$ at 2005 PPP prices). As expected, wages increase with age. However, younger workers' real wages seem to be falling across cohorts, which may be related to the level of increasing informality and unemployment described beforehand. Since the informal sector has grown, and young workers tend to begin their labor market experience here, this seems like one of the

reasons behind the observed lower wages. Similarly, the increased unemployment among young workers could explain the observed real wage pattern.

The findings in this section provide a first description on the relationships that this paper seeks to study. On the one hand, there is evidence that younger workers today have higher unemployment than younger workers in the past and there are no signs of catching-up as workers age. Moreover, the evidence also suggests that informality has been growing, but it decreases with age. On the other hand, there is also evidence that wages are lower for young individuals in younger cohorts, perhaps induced by the inability to procure jobs (due to high unemployment) or because of operating in the informal sector. Therefore, the next step is to estimate the empirical relationship between unemployment and informality during early labor market years and adult outcomes using the models proposed beforehand.

5. Findings

5.1 The consequences of youth unemployment and informality on adult outcomes

The consequences of youth unemployment and informality will be assessed on several outcome variables. For the first, these will be: unemployment and the logarithm of hourly wages (in US\$ at PPP). For youth informality, the analysis will concentrate on adult informality and wages.

The base specification used throughout the analysis includes the following covariates: gender, age and its square, as well as dummy variables which identify if the individual is a household head, their educational level and regions.¹² As mentioned, these regressions are estimated by OLS and the variance corrected for heteroskedasticity and for the grouped nature

of the main explanatory variable. In particular, the Tables 5 and 6 present the coefficients for $\hat{\beta}$

and $\hat{\delta}$ for each dependent variable, their standard error and the number of observations for each equation.

The results for unemployment persistence are presented in the first row of Table 5 and show no significant effects of youth unemployment on future unemployment: all estimated coefficients are not statistically different from zero, indicating that youth unemployment does not seem to be persistent when considering an individual's entire adult life. The final row of the table presents the estimates of wage scarring due to youth unemployment. Again, the analysis finds no significant evidence of a scarring effect of youth unemployment in the selected countries.

¹² In particular, six educational categories are included: primary incomplete, primary complete, secondary incomplete, secondary complete, university or college incomplete and university or college complete. The omitted category is the first. Regions are specific to each country, and are as defined in Gasparini (2011).

By country									
Dependent variable	Argentina	Brazil	Chile	Costa Rica	El Salvador	Mexico	Uruguay	Venezuela	
Unemployment	0.047	0.158	-0.271	-0.097	0.466	0.013	0.061	-0.023	
	(0.094)	(0.204)	(0.216)	(0.153)	(0.469)	(0.125)	(0.407)	(0.276)	
Observations	35,088	1,080,916	198,053	85,458	66,248	88,805	159,802	233,818	
Log Wages	-0.043	0.421	1.039	0.403	-1.570	-0.144	0.777	-0.137	
	(0.250)	(1.039)	(1.157)	(0.539)	(1.371)	(1.097)	(0.704)	(0.672)	
Observations	31,619	1,000,147	181,992	91,859	63,306	55,537	133,542	223,716	

Table 5
Adult labor market outcomes and youth unemployment
By country

Source: Author's calculations from pseudo-panel data for each country.

Notes: Each parameter corresponds to the coefficient and standard error on the cohort-specific youth unemployment in equations (1) and (2).

Standard errors (in parentheses) clustered by cohort cells.

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

Table 6 presents the results for youth informality. Since not all countries have information on informality using a legalistic definition, estimates are only available for five cases. In two of the countries, Argentina and Chile, there is evidence of a positive and significant correlation between youth informality and future informality. Therefore, in these cases, starting in an informal job seems to condition these workers to remain in that sector. In contrast, the estimates for the remaining countries show no evidence of persistence, which may be interpreted as reflecting the findings by Bosch and Maloney (2010) that the informal sector is only a temporary stop for young workers in the labor market. This last explanation seems to be further supported by the wage scarring results in the final row of Table 6, which show that youth informality does not seem to have an adverse effect on wages earned as adults, even in the countries which denote informality persistence.

Adult labor market outcomes and youth informality								
Dependent variable	Argentina	Brazil	Chile	Costa Rica	El Salvador			
Informality	0.165	-0.044	0.067	-0.112	0.010			
	(0.071)**	(0.079)	(0.035)*	(0.130)	(0.145)			
Observations	24,651	674,749	144,334	57,685	38,524			
Log Wages	-0.026	0.148	0.004	0.165	-0.105			
	(0.182)	(0.115)	(0.115)	(0.245)	(0.203)			
Observations	26,083	865,964	145,761	72,820	50,191			

Source: Author's calculations from pseudo-panel data for each country.

Notes: Each parameter corresponds to the coefficient and standard error on the cohort-specific youth informality rate in equations (1) and (2).

Standard errors (in parentheses) clustered by cohort cells.

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

Therefore, these global results indicate that for the sample used here, there seem to be no adverse effects of unemployment on future unemployment or wages. However, there is evidence of informality persistence in some countries, although no subsequent adverse effect on wages. While illustrative, these results assume that youth unemployment and informality have an average effect during the entire adult life. Nevertheless, it may be that these experiences may have either short or long term consequences, which may not be properly captured by averaging out across adulthood. Therefore, the next step is to obtain estimates of these potential life cycle differences to relax this assumption. Moreover, it will help identify if the average effects are masking heterogeneities across adult working lives.

5.2 Youth unemployment and informality: short-run blemishes or long-term effects?

To capture these life cycle differences, the analysis estimates equations (3) and (4). The covariates in these regressions are the same as for the previous estimates and include the interaction effects in order to capture heterogeneities in the effect from youth unemployment and informality in the short and long term. However, in contrast to the average estimates, the variance is not clustered by groups since youth unemployment and informality are interacted with the life cycle identifier b_i^j which varies at the individual level. For simplicity, the reported estimates in this section provide the sum of the main effect of youth unemployment or informality ($\hat{\beta}$ or $\hat{\delta}$) with each of the interactions λ^j to observe the correlation between these experiences and adult outcomes 5, 10, 15, 20 and 25 years after youth.

Table 7 shows the results for youth unemployment. Figures 7-8 present this information graphically by showing the respective point estimates at each selected point in the life cycle and their confidence intervals (at 90 percent significance). In general, although the results differ according to the country under consideration, some patterns emerge. For instance, most of the countries –Argentina, Brazil, Costa Rica, El Salvador, Mexico and Uruguay– show a positive and significant relationship between youth unemployment and adult unemployment.

				<u>, eaning</u>				
Dependent variable	Argentina	Brazil	Chile	Costa Rica	El Salvador	Mexico	Uruguay	Venezuela
Unemployment								
5 years after youth	0.039	0.258	-1.461	0.331	0.863	0.497	0.997	-2.502
	(0.118)	(0.066)***	(0.184)***	(0.136)**	(0.347)**	(0.213)**	(0.326)***	(0.207)***
10 years after youth	0.069	0.041	0.979	0.041	0.154	0.081	0.765	1.372
	(0.054)	(0.056)	(0.200)***	(0.134)	(0.327)	(0.230)	(0.302)**	(0.189)***
15 years after youth	0.115	-0.101	-0.187	-0.412	0.823	-0.320	0.753	-0.628
	(0.036)***	(0.248)	(0.148)	(0.463)	(0.336)**	(0.495)	(0.508)	(0.152)***
20 years after youth	0.093	0.115	-1.325	0.520		0.658	1.204	-2.123
	(0.044)**	(0.236)	(0.186)***	(0.205)**		(0.281)**	(0.363)***	(0.202)***
25 years after youth	0.051	0.230						
	(0.072)	(0.083)***						
Observations	35,088	1,080,916	198,053	85,458	66,248	88,805	159,802	233,818
Log Wages								
5 years after youth	-0.352	-0.727	-10.599	0.257	0.431	-5.185	-8.956	13.308
	(0.256)	(0.188)***	(0.552)***	(0.389)	(1.060)	(1.234)***	(0.709)***	(0.470)***
10 years after youth	0.272	-0.117	4.797	1.503	-13.928	-6.519	-8.592	-3.356
	(0.141)*	(0.174)	(0.510)***	(0.387)***	(1.133)***	(1.258)***	(0.677)***	(0.483)***
15 years after youth	0.200	-0.282	-1.980	2.554	1.379	-14.180	-8.274	2.000
	(0.094)**	(0.822)	(0.487)***	(1.464)*	(1.046)	(3.541)***	(1.216)***	(0.396)***
20 years after youth	0.450	-0.128	-9.098	0.774		-10.120	-11.307	11.252
	(0.112)***	(0.790)	(0.575)***	(0.641)		(1.864)***	(0.802)***	(0.469)***
25 years after youth	-0.174	-0.921						
	(0.186)	(0.260)***						
Observations	26,083	865,964	145,761	72,820	50,191	43,838	119,979	186,285

Table 7 Adult labor market outcomes and youth unemployment after youth By country

Source: Author's calculations from pseudo-panel data for each country.

Notes: Each parameter corresponds to the coefficient and standard error on the cohort-specific youth unemployment in equations (3) and (4).

Robust standard errors in parentheses.

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

More specifically, in Argentina, Brazil and El Salvador, unemployment persistence seems to be stable across time. This effect is present in the early adulthood and individuals seem to be unable to escape this trend later. For instance, the positive correlation between youth and adult unemployment in El Salvador is 0.86 when only five years have passed since youth and 0.82 fifteen years after youth. These figures are approximately 0.10 for Argentina and 0.25 for Brazil¹³.

In contrast, Costa Rica, Mexico and Uruguay show rising consequences from youth unemployment throughout time. That is, adult individuals face a larger penalty in terms of unemployment as they age. This result suggest the existence of some kind of unemployment trap in these countries since adult individuals fail to enter into a stable employment pattern having been exposed to higher unemployment in their early labor market years.

Finally, Chile and Venezuela show completely different results. Surprisingly, the estimated effect is negative in the early adulthood, positive in the following years and then becomes negative again. Therefore, it seems that young individuals in these countries succeed in escaping the typical high unemployment trend but the risk of unemployment still remains in the long term.

¹³ These figures are the average between the statistically significant effects in these countries.

The consequences of youth unemployment on adult wages also present different trends among countries. For instance, wage scarring is found in Brazil, Chile, El Salvador, Mexico and Uruguay. In some of these, there is evidence of a penalty that tends to increase with time, such as in Uruguay and Mexico. In Brazil, the findings show that youth unemployment represents an initial blemish but also poses a long-term scar. These countries seem to be consistent with labor markets where unemployment causes human capital depreciation and the loss of specific skills (Becker, 1975), which translates into an increased probability of obtaining lower quality work and wages (Pissarides, 1994). The other spectrum of countries includes Argentina, Costa Rica and Venezuela. In these cases, the correlation between youth unemployment and adult wages is positive. One plausible explanation is that those adults that remained employed not only avoided the unemployment persistence effect but also the associated wage penalty.

In similar fashion to the unemployment results, the consequences of youth informality at different points in adulthood are presented in Table 8. Additionally, Figures 9 and 10 plot these estimates and their confidence intervals.

	Table 8									
Adult labor market outcomes and youth informality after youth										
<u> </u>		By count	ry Olin	0						
Dependent variable	Argentina	Brazil	Chile	Costa Rica	El Salvador					
Informality										
5 vears after vouth	3.197	-0.216	-0.076	-0.292	-0.040					
, ,	(1.935)*	(0.077)***	(0.035)**	(0.108)***	(0.110)					
10 years after youth	2.391	-0.053	0.020	-0.067	-0.374					
	(1.471)	(0.030)*	(0.039)	(0.108)	(0.115)***					
15 years after youth	2.000	0.065	0.009	0.141	0.011					
	(1.180)*	(0.028)**	(0.041)	(0.186)	(0.108)					
20 years after youth	1.979	0.064	-0.001	-0.294	. ,					
	(1.059)*	(0.053)	(0.043)	(0.144)**						
25 years after youth	14.014	-0.273								
	(8.879)	(0.107)**								
Observations	24,651	674,749	144,334	57,685	38,524					
Log Wages										
5 years after youth	-3.996	0.320	-1.078	0.286	0.062					
	(2.691)	(0.106)***	(0.065)***	(0.141)**	(0.154)					
10 years after youth	-3.028	0.146	-0.149	0.390	-2.017					
	(2.055)	(0.043)***	(0.068)**	(0.137)***	(0.164)***					
15 years after youth	-2.615	0.017	-0.018	0.107	0.257					
	(1.666)	(0.040)	(0.087)	(0.254)	(0.153)*					
20 years after youth	-2.864	-0.084	-0.645	0.405						
	(1.505)*	(0.076)	(0.088)***	(0.187)**						
25 years after youth	-18.438	0.412								
	(12.370)	(0.148)***								
Observations	26,083	865,964	145,761	72,820	50,191					

Source: Author's calculations from pseudo-panel data for each country.

Notes: Each parameter corresponds to the coefficient and standard error on the cohort-specific youth informality rate in equations (3) and (4).

Robust standard errors in parentheses.

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

In the average adult estimates, Argentina showed signs of informality persistence. Upon closer inspection, this effect seems to reflect an impact 5 years after youth and also a long-run effect 15 and 20 years after youth. This denotes that in this particular case, informality has mainly long-lasting consequences on adult informality. The other case which showed informality persistence in the general case was Chile. However, decomposing the observed effect shows that youth informality actually falls in the initial five years after youth and then the effect fades out.

The remaining countries showed no informality persistence in the average case, but do present some significant relationships across the life cycle. For instance, while there was no observable effect of informality persistence in Brazil, there is actually evidence that youth informality decreases adult informality in the first ten years after youth, but later shows a positive relationship. This may capture the possibility that workers manage to migrate to the formal sector in their initial years of adult life because of the training receive in the informality during youth, but the scar appears later in their working lives, showing that informality during youth conditions these workers to remain in that sector.

In turn, Costa Rica and El Salvador show that informality decreases across the life cycle, despite having high informality during youth. These cases may reflect the effect of informal work as a pathway to obtain experience and tenure in different jobs, which may enhance an individual's chances to acquire a formal job further down the line. Therefore, the evidence does seem to fall in line with the results from Bosch and Maloney (2010) and Cunningham and Bustos (2011).

In terms of wage scarring from youth informality, Argentina shows significant long-term effects, but no blemishes. In Chile, however, there is evidence of an initial significant blemish which falls across time. For El Salvador, there are significant negative consequences on wages ten years later. Finally, in the remaining countries, there is evidence of an earnings gain in the initial years after youth, perhaps once again capturing some effect from the 'training' accumulated from worker's passage through the informal sector.

In general, the decomposition of the effect of youth experiences into short and long-term consequences reveals some patterns not evident from averaging across adulthood. Particularly, the analysis finds evidence of unemployment persistence and scarring for several countries as well as significant consequences of informality. Since the pool of countries is ample, there is some heterogeneity in the estimates. For instance, youth unemployment and informality show evidence of short-term blemishes in some countries, and longer lasting consequences in others.

6. Discussion

This paper studied the relationship between the levels of youth unemployment and informality on adult outcomes in 8 Latin American countries using pseudo-panels on comparable microdata. The main results indicate that when averaging out the effect of youth experiences across adulthood, there seems to be no significant effect of youth unemployment or informality, except in some cases. However, when disaggregating this effect to account for differences in the individual's life cycle, some patterns emerge more clearly.

For instance, most countries show evidence of unemployment persistence for workers exposed to high unemployment during their youth. For some of the cases, the effect represents a temporary blemish and for others a more lasting, structural consequence. In terms of wage scarring, there are also mixed results. While some countries show a clear negative relationship between youth unemployment and adult wages (e.g. Mexico and Uruguay), this correlation is less clear in others (Argentina and Venezuela). With respect to the consequences from youth informality on adult informality, there is evidence of some clear long-term positive relationship (in Argentina); but there are also some results which seem less intuitive from a theoretical perspective (positive relationship between informality and wages). These results probably respond to the heterogeneity in the selected labor markets.

Therefore, as an initial exercise in the study of the school-to-work transition and the consequences of youth labor market experiences, these findings constitute a preliminary step and will hopefully contribute to further research in this direction. Specifically, a limitation of this comparative analysis is the omission of detailed, country-specific factors which may further help characterizing these results and obtaining more conclusive evidence. While comparability across the region presents a contribution in terms of empirical evidence, using a more restricted context may enhance the understanding of unemployment and informality scarring in each of the countries. Moreover, it may provide knowledge on the channels which drive the results. The findings from such studies will constitute a highly relevant input to design labor policies targeted at young workers to help their insertion and minimize the potential scarring effects.

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8. **Statistical Annex**

Table 4 Trends and patterns in labor market outcomes, Latin America By cohort

Outcome	Age groups								
Outcome	[15,19]	[20,24]	[25,29]	[30,34]	[35,39]	[40,44]	[45,49]		
Labor force participation									
Cohort 1		71.00	69.97	74.04	77.78	79.21	77.76		
Cohort 2	55.66	66.21	72.00	77.09	80.00	80.84			
Cohort 3	46.36	67.85	75.23	78.92	81.12				
Cohort 4	48.24	70.05	77.08	80.82					
Employment									
Cohort 1		64.85	66.71	70.84	74.16	75.16	74.71		
Cohort 2	49.75	61.05	67.90	72.84	75.62	77.48			
Cohort 3	41.99	61.82	69.86	73.80	77.32				
Cohort 4	42.11	62.22	70.25	76.11					
Unemployment									
Cohort 1		8.68	4.64	3.95	4.57	5.02	3.89		
Cohort 2	10.54	7.85	5.36	5.42	5.38	4.12			
Cohort 3	10.15	8.64	7.00	6.34	4.61				
Cohort 4	12.98	10.98	8.68	5.75					
Unemployment duration (in months) ¹									
Cohort 1		5.09	3.55	10.75	13.19	14.94	16.45		
Cohort 2	4.61	3.35	10.37	13.52	15.04	15.61			
Cohort 3	2.55	8.65	12.69	14.46	14.89				
Cohort 4	6.71	10.20	13.45	14.79					
Informality									
Cohort 1		34.15	26.38	26.95	34.38	33.78	34.23		
Cohort 2	63.44	35.45	30.02	35.52	34.27	34.07			
Cohort 3	62.71	38.63	38.20	35.71	35.48				
Cohort 4	65.07	47.07	39.43	36.21					
Hourly wage (USD at 2005 PPP)									
Cohort 1			3.85	3.61	4.12	4.01	4.71		
Cohort 2		2.93	3.04	3.73	3.76	4.26			
Cohort 3	1.90	2.29	3.10	3.41	3.89				
Cohort 4	1.46	2.22	2.98	3.65					

Source: Author's calculations from pseudo-panel data for each country. Notes: The values in the table are calculated as a weighted average of the country statistic, using the proportion of population in the year described in Table 3 as weights.

Figure 1 Latin America: Labor force participation by cohort



Source: Author's calculations from pseudo-panel data for each country. Notes: Cohorts are defined in Table 2 and the years used as weights for the regional averages are in Table 3.





Source: Author's calculations from pseudo-panel data for each country. Notes: Cohorts are defined in Table 2 and the years used as weights for the regional averages are in Table 3.

Figure 3 Latin America: Unemployment rates by cohort



Source: Author's calculations from pseudo-panel data for each country. Notes: Cohorts are defined in Table 2 and the years used as weights for the regional averages are in Table 3.





Source: Author's calculations from pseudo-panel data for each country. Notes: Cohorts are defined in Table 2 and the years used as weights for the regional averages are in Table 3.

Figure 5 Latin America: Informality rates by cohort\



Source: Author's calculations from pseudo-panel data for each country. Notes: Cohorts are defined in Table 2 and the years used as weights for the regional averages are in Table 3.





Source: Author's calculations from pseudo-panel data for each country. Notes: Cohorts are defined in Table 2 and the years used as weights for the regional averages are in Table 3.



Figure 7 The consequences of youth unemployment on adult unemployment

Source: Author's calculations from pseudo-panel data for each country. 90% Confidence intervals in dotted lines.



Figure 8 The consequences of youth unemployment on the logarithm of adult wages

Source: Author's calculations from pseudo-panel data for each country. 90% Confidence intervals in dotted lines.



Figure 9 The consequences of youth informality on adult informality

Source: Author's calculations from pseudo-panel data for each country. 90% Confidence intervals in dotted lines.



Figure 10 The consequences of youth informality on the logarithm of adult wages

Source: Author's calculations from pseudo-panel data for each country. 90% Confidence intervals in dotted lines.