

Real Wages and Skill Premiums in Latin America, 1900-2011

Online Annex

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This annex describes the sources used and the assumptions made in constructing wage series for skilled, semi-skilled, and unskilled labour for Argentina, Brazil, Chile, Colombia, Mexico and Venezuela. It also includes details on sources and procedure used to calculate series of income per worker.

I. Real wages

To assemble the series as comparable as possible across countries, wage levels are set in a given period (usually within 1965-1980) using the following procedure:

- *Unskilled wage level.* This is calculated as a weighted average of the real wage for the unskilled rural and urban workers. In general, I rely on comparable series of unskilled wages in agriculture and the urban minimum wage from PREALC (1982). Both series are in monthly terms and in local currencies at 1970 prices. In each case, the weight for the unskilled rural wage ($RU\%$) is calculated as the share of the traditional agricultural sector in the low-income economically active population (EAP) using data circa 1970 from the same source.¹ The weight of the unskilled urban wage is the complement of $RU\%$.
- *Semi-skilled wage level.* The basic data are hourly wages of adult males in seven occupations in the construction industry (bricklayers and masons, structural iron workers, concrete workers, carpenters and joiners, painters, plumbers, and electrical fitters) collected in the International Labour Organization's October Inquiry/Part I (ILO/OI1) – ILO (1936-1964).² In order to improve consistency across countries, I calculate ratios of the average semi-skilled wage in the construction industry to the unskilled wage in four sectors (construction, textiles, electricity generation and local government) from the same source, both in hourly terms and at current local currencies. Those ratios are then applied to the unskilled urban monthly wages at 1970 prices sourced from PREALC (1982). In this way, hourly current wage data are converted into monthly values at constant prices, which can be directly compared to the calculated unskilled wages.

¹ Total EAP is split into urban (formal, informal and domestic service), and rural (modern and traditional sectors). The low-income EAP is obtained by adding up the corresponding EAP of traditional agriculture, urban domestic services, and half of the urban informal sector.

² The choice of these occupations as representative of semi-skilled workers is supported by Berg (1968: 13) in his study on the wage structure in developing countries: "The distribution of skills is likely to be skewed heavily to the low skill side within any classification (e.g. crafts such as electricians and carpenters). Most workers classified as skilled workers (e.g. carpenters) in less developed countries are more often than not specialised semi-skilled workers".

- *Skilled wage level.* I use monthly wages for clerks (usually an average of bank tellers and accountants) sourced from the International Labour Organization’s October Inquiry/Part II (ILO/OI2) - ILO (1964-1982) - as representative of relatively skilled workers. These data are in local currencies and current prices. To obtain levels in constant values consistent with my previous two series, I calculate the ratio of the average monthly wage for clerks to the unskilled average wage (over four sectors) from ILO/OI1.³ Such ratios are then applied to the minimum monthly urban wage at 1970 prices. I also compare, when available, the resulting monthly values with the average wage in manufacturing from PREALC (1982). And when there is a significant gap between the two figures a level adjustment is made to reduce it.

Table OA-1 below summarises the procedure and offers representative values by country for each of the series, together with sources, and the units of the original data used in each case.

Table OA-1: Procedure used to set wage levels

	source		Argentina		Brazil		Chile		Colombia		Mexico		Venezuela	
	units		values	years	values	years	values	years	values	years	values	years	values	years
Unskilled														
(1) rural minimum	PREALC	LC 1970, m	232	1969-71	109	1969-71	0.38	1969-71	250	1969-71	579	1969-71	367	1975-77
(2) urb.off.minimum	PREALC	LC 1970, m	227	1969-71	178	1969-71	0.70	1969-71	420	1969-71	798	1969-71	372	1975-77
(3) RU% c.1970	PREALC	share	0.38		0.77		0.46		0.65		0.69		0.58	
(4) average unskilled = RU%*(1)+[1-RU%]*(2)	calc.	LC 1970, m	229	1969-71	127	1969-71	0.55	1969-71	309	1969-71	646	1969-71	369	1975-77
Period where this procedure is applied			1965-78		1966-78		1965-80		1965-76		1965-80		1974-75	
Semi-skilled														
(5) construction	ILO/OI1	LC, h	2.65	1970	3.13	1971-75	0.42	1962-63	80.8	1982	5.41	1965-66	3.3	1965-66
(6) unskilled/buiding	ILO/OI2	LC, h	1.78	1970	1.6	1971-75	0.27	1962-64	48.3	1982	3.19	1965-66	2	1965-66
(7) urb.off.minimum	PREALC	LC 1970, m	220	1970	179	1971-75	0.67	1965	568	1982	703	1965-66	305	estimated
(8) avg. semi-skilled = [(5)/(6)]*(7)	calc.	LC 1970, m	360		350		1.15		950		1192		504	
Period where this procedure is applied			1954-74		1971-75		1936-65		1982		1940-80		1936-80	
Skilled														
(9) clerks	ILO/OI2	LC, m	585	1971	1027	1972-74	0.79	65,66, 69	13333	1981	1652	1967-1969	1143	1974
(10) unsk. avg. (4 sectors)	ILO/OI1	LC, m	251	1971	329	1972-74	0.30	65,66, 69	5612	1981	763	1967-1969	409	1974
(11) urb.off.minimum	PREALC	LC 1970, m	235	1971	173	1972-74	0.67	1966-68	525	1979-81	764	1967-1969	376	1974
(12) average skilled = (9)/(10)*(11)	calc.	LC 1970, m	630		540		1.813		1372		1652		1051	
average manufacturing	PREALC	LC 1970, m	612		615	1972-74	n.a.		1360		1678		1077	1974
Period where this procedure is applied			1971		1972-74		1967-68		1979-81		1967-69		1965-74	
Calculated real wages in PPP\$ of 1970, circa 1970														
unskilled wage	calc.	PPP\$ 1970	77.6		31.1		48.6		30.0		72.8		76.4	
semi-skilled wage	calc.	PPP\$ 1970	120.2		78.0		109.8		72.3		136.5		140.8	
skilled wage	calc.	PPP\$ 1970	207.1		114.8		209.0		125.9		190.8		239.6	

Notes: RU%= rural share of low-skilled labour; LC= local currencies; urb.off.minimum= urban official minimum, m= monthly, d=daily, h=hour; calc.= calculated values; n.a.= not available. Values in (10) are originally hourly wages. Manufacturing wage in Argentina refers to “*nacional pagado*”. Adjustment factors applied are: 1.1 for semi-skilled wages and 1.15 for skilled wages in Argentina; 1.1 for semi-skilled wages and 1.05 for skilled wages in Chile; 1.1 for skilled wages in Colombia.

Outside the core period I use the rate of growth of wage series from various sources. When necessary two interpolations procedures are employed to fill the gap between two given data points y_0 and y_n in a series y : linear interpolation, and pattern interpolation which uses information of a

³ This average wage is originally in hourly terms and is converted in monthly terms by assuming 8 hours per day and 24 days per month.

known series x to fill the gap in y .⁴ Unless otherwise indicated, linear interpolation is the default procedure. When the original wage data are in nominal terms, the consumer price index (CPI) is usually used as a deflator. Full details are given at the end of each country section. An overriding constraint is that the three wage series of a given country cannot cross over time as this would imply negative returns to skills. To have wages in a single currency across countries I calculate purchasing power parity values (PPP\$) using the PPP exchange rates to the US dollar available for circa 1970 (ECLA, 1978).

The periods used to set the levels are preceded by an asterisk.

Argentina

Unskilled wages (w_4):

1900-1914: real salaries for unskilled workers in government (*peones de policia*) at 1903 prices from Cortes-Conde (1979). In order to allow for the splicing with the following series, figures in 1913 and 1914 are calculated using the growth rate of real GDP per capita (Bértola and Ocampo, 2012).

1914-1926: a simple average of real salaries and wages for unskilled men from Shipley (1977). Data points in 1914, 1917, 1921-22, 1926.

1926-1936: average real wage in agriculture from IEERAL(1986) *in australes of 1960*.

1936-1965: weighted average of two series: i) average real wage in agriculture from IEERAL(1986) *in australes of 1960*; and ii) the average of unskilled wages in four industries (construction, textiles, electricity, city council) from ILO/OI1. Data points in 1936-37, 1939-51, 1943, 1947, 1951, 1954-65. To estimate the weights, I adjust the $RU\%$ in 1970 (see below) in line with changes in the rural population (this procedure results in a $RU\%$ in 1950 = 0.55).

*1965-1978 (in levels): weighted average of the real wage for the unskilled worker in agriculture (national level) and the minimum urban real wage. Both series in pesos of 1970 from PREALC (1982). The weight for $RU\%$ in 1970 = 0.38.

1978-2000: real unskilled wage index (*salarios básicos de convenio*) from González (2004).

2001-2011: nominal monthly earnings in retailing from *Ministerio del Trabajo, Empleo y Seguridad Social* website.

Semi-skilled wages (w_3):

1900-1903: real salaries for blue collar workers (*obreros*) of the food-processing firm Bagley (Buenos Aires) at prices of 1903 from Cortes-Conde (1979).

1903-1915: simple average of two series: i) wages for masons; and ii) *obreros* in Bagley (Buenos Aires). Both at prices of 1903 from Cortes-Conde (1979). In order to allow for the splicing with the following series, the 1913 and 1914 figures are calculated using the growth rate of real GDP per capita (Bértola and Ocampo, 2012).

1915-1954: real average wage excluding agriculture and government in australes of 1960 from IEERAL (1986).

1954-1967: average hourly wage in seven occupations in the construction industry sourced from ILO/OI1. Data points in 1936-43, 1947, 1951, 1954-67.

*1967-1974 (in levels): uses the average hourly wage in seven occupations in the construction industry sourced from ILO/OI1.

1974-1984: real average wage excluding agriculture and government in australes of 1960 from IEERAL (1986).

⁴ For a given year “t” in the interpolated period y_0 - y_n , the in-between values are estimated according to the following expression: $y_t = y_{t-1} * [(x_t / x_{t-1}) / [(x_n/x_0)/(y_n/y_0)]]^{1/n}$. This method is used in Willebald (2011) and Rodríguez Weber (2014).

1984-2000: real wages of relatively skilled workers (*salarios básicos de convenio*). Index 1980=100, from González (2004).

2000-2011: nominal monthly earnings in commerce, construction, and hotels and restaurants (simple average) from *Ministerio del Trabajo, Empleo y Seguridad Social* website.

Skilled labour (w_2):

1900-1971: average monthly industrial salary in pesos at 2004 prices from Ferreres (2005).

*1971 (in levels): monthly average salary for bank tellers and clerks (stock record) from ILO/OII (circa values).

1971-1979: real average wage (paid) in manufacturing (national level) at pesos of 1970 from PREALC (1982).

1979-1995: average monthly industrial salary in pesos at 2004 prices from Ferreres (2005).

1995-2011: nominal monthly earnings in manufacturing from *Ministerio del Trabajo, Empleo y Seguridad Social* website.

Deflators: CPI sourced from MOXLAD up to 1980 and from INDEC between 1980 and 2004. Thereafter, to avoid the under-reporting of CPI inflation by INDEC, I use a CPI covering seven provinces compiled by CENDA.

Brazil

Unskilled wages (w_4):

1900-1911: growth in line with an average wage of two occupations of low skills urban workers: labourers of a small plot to produce fruit and vegetables (*hortelão*) and porters from Lobo (1978).

1911-1938: in 1911, 1921, 1924-1928 and 1934-1939 uses the average daily rural wage for unskilled farm workers (*trabalhador da enxada*) in mil-réis in five representative states, namely: Bahia, Minas Gerais, Pernambuco, Rio de Janeiro, and Sao Paulo (BR5). This is sourced from Ministerio da Agricultura, Industria y Comercio (1924) in 1911 and 1921, and from IBGE's Anuário Estatístico do Brasil (AEB) in the remaining years. There is no data available for Rio de Janeiro in 1911 and 1920, and for Sao Paulo in 1911. In these cases I made estimates based on proportionality with data available for other regions. I am excluding an outlier for Sao Paulo in 1934. Figures in 1920, 1922-23 are interpolated. For the years 1913 to 1919 I use pattern interpolation based on the minimum rural daily wage index in the Sao Paulo region from Cardim (1936). The Cadim series is extended backwards to 1911 and forward to 1920 using rate of growth an average wage for *hortelão* and porters from Lobo (1978). 1928-1930: growth in line with the series of an average wage for *hortelão* and porters from Lobo (1978). Linear interpolation is used between 1930 and 1934.

1938-1948: in 1938 I use the daily wage of 5.800 mil-réis from IBGE AEB and in 1948 the daily wage of 16.000 mil-réis from Varela Sendin (1972). To fill in the gap between the two benchmarks I use pattern interpolation based on the average earnings for industrial workers in Sao Paulo for the lowest quintile of the earnings structure (this reflects unskilled urban wages) from Wells (1983: Table 2, 303).

1948-1958: earnings from the unskilled worker in agriculture (*remuneração do trabalho agrícola - diarista*) from the *Instituto de Economia Agrícola* (IEA) – available at IPEA website.

1958-1969: the weighted average of two series: i) earnings from unskilled workers in agriculture from IEA; ii) real average wage of unskilled workers in the construction industry (up to 1964) calculated from hourly wages reported in ILO/OII available for 1958 and 1971 (the gap is filled in with linear interpolation). For 1965-1968 I use the unskilled wage in the construction sector at 1970 prices from PREALC (1982). To calculate the weighted average I use the $RU\%$ in 1970 = 0.77 (see below).

*1969-1978 (in levels): weighted average of the real wage for the unskilled worker in agriculture (national level) and the minimum urban real wage. Both are monthly series in cruzeiros of 1970 from PREALC (1982). The weight to calculate the average is $RU\%$ in 1970 = 0.77.

1978-2011: weighted average of two series: i) earnings from the unskilled worker in agriculture from IEA (based on April and November data for the Sao Paulo region); and ii) minimum real urban wage from ECLAC up to 2000 and the minimum real wage from IPEA up to 2011. To estimate the weights, I extend forward the $RU\%$ in 1970 in line with changes in the rural population (this procedure results in a $RU\%$ in 2000 of 0.40).

Semi-skilled wages (w_3):

1900-1930: average wage for three occupations in the construction industry (mason, painter, and carpenter) from Lobo (1978).

1930-1936: for 1924 and 1934-1937 there are data available for daily wages for rural workers (mason and carpenter) in Rio de Janeiro (IBGE AEB 1936 and 1938). I use these data to extend forward my series based on Lobo's data up to 1937. Values between 1930 and 1934 are interpolated.

1936-1971: there are wage data by occupations from ILO/OI1 in 1936, 1943, 1958, and 1971-1976. For those benchmark years I calculate averages wages for seven occupations in the construction industry, using linear interpolation to fill in the gap between 1936 and 1943. Between 1943 and 1958, and 1958 and 1971 I use pattern interpolation using as auxiliary series the mean wage for blue collar workers from Bacha (1979: Table 5, 610) for the period 1946-1971. Bacha uses this series as representative of relatively low skills urban workers. I add one observations to both ends of the original Bacha series using Wells (1983) for the first earnings quintile.

*1971-1975 (in levels): uses as basic data the average hourly wage in seven occupations in the construction industry from ILO/OI1.

1975-1979: real wages of unskilled workers (*peones*) in the construction sector in cruzeiros of 1970 from PREALC (1982).

1979-1991: simple average of the real average wage index and the minimum real wage index (1990=100) from ECLAC website.

1991-2011: average nominal monthly earnings in construction and retailing (IBGE website).

Skilled labour (w_2):

1900-1928: average wage of machine operator (*operario de maquinas*) and middle level factory manager (*chefes seção de fabrica*) from Lobo (1978).

1928 and 1943: data for this period comes from a group of occupations for blue workers that are relatively skilled available in the 1928 industrial census of Rio de Janeiro (here I am using four occupations: patternmakers, turners, iron moulders, and fitters and on the ILO/OI1 in 1936 and 1943 (an average of wages for five occupations: cabinet makers, machine compositors, fitters & turners, iron moulders, and patternmakers). In this way, I can provide three benchmarks to splice the data up to 1928 with that starting in 1943. To fill in the gap between 1928 and 1936 I use pattern interpolation using as an auxiliary series the rate of growth of meat consumption per-capita in Rio de Janeiro (from IBGE AEB, 1936 and 1941), and linear interpolation between 1936 and 1946.

1943-52: wage series from Wells (1983: Table 2, 303) for the third quartile of the earnings structure in Brazil's manufacturing industry.

1952-68: the mean industrial real earnings for blue collar workers in the State of Sao Paulo (Wells, 1983: Table 1, 299). There are missing values between 1956 and 1961. The gap is filled with pattern interpolation using average hourly earnings in manufacturing (Mitchell, 2003) as the auxiliary series.

1968-1973: average monthly real wage in manufacturing (cruzeiros of 1970), national level, from PREALC (1982).

*1973 (in levels, circa values): monthly average salary for bank tellers and clerks (stock record) from ILO/OI2.

1973-1979: average monthly real wage in manufacturing (cruceiros of 1970), national level, from PREALC (1982).

1979-1990: the average nominal wage in manufacturing, São Paulo region, sourced from *Federação e Centro das Indústrias do Estado de São Paulo* in IPEA data.

1990-2011: a simple average of two ECLAC series: the average real wage in manufacturing and the overall average real wage.

Deflators:

1900-1913: whole sale price index from Catão (1992).

1913-1970: CPI for Rio de Janeiro available in Abreu et al. (1990).

1970-1996: implicit GDP deflator from IBGE website.

1996-2011: CPI (*IPA ampliado*) from IBEG website.

Chile

Unskilled wages (w_4):

1900-29: growth in line with a wage index that combines two series (using equal weights): daily real wage for unskilled rural workers (*jornal del peon rural real*) at 1913 prices sourced from Matus (2009, Anexo 8, deflated by the author's price index in Table 20); and annual salaries for unskilled urban workers in escudos of 1960 from Rodríguez Weber (2014). During 1927-1929 the rural wage is estimated based on the average ratio in 1925-26 of daily wages of unskilled workers in agriculture to those in mining in Matus (2009). This ratio is applied to the data on unskilled wages in mining available in Matus (2009).

1929-1965: simple average of annual average earnings of workers in agriculture and urban unskilled workers. Both series in escudos of 1960 sourced from Rodríguez Weber (2014). The assumption of given equal weights to both series reflect an urbanisation rate in the 50%-60% range during the period.

*1965-80 (in levels): weighted average of the real wage for the unskilled worker in agriculture (minimum wage) and the minimum urban real wage (*mínimo urbano vital*). Both are monthly series in pesos of 1970 from PREALC (1982). The weight for $RU\%$ in 1970 = 0.46.

1980-1993: annual earnings of unskilled urban worker in escudos of 1960 from Rodríguez Weber (2014: Table AE8).

1993-2009: INE nominal wages for unskilled workers

2009-2011: real minimum wage from ECLAC website.

Semi-skilled wages (w_3):

1900-1930: average real wage (*media ponderada de rubros medios plus extensos*) at 1913 prices from Matus (2009: Anexo 8 - deflated by the author's price index in Table 20). To complete the series from 1927 up to 1930 I use an average real wage three sectors (food, textiles, and construction) from the same author.

1930-37: annual salaries for unskilled urban workers in escudos of 1960 sourced from Rodríguez Weber (2014). This assumes that semi-skilled wages grew at rates similar to those of unskilled urban wages during the period.

1937-65: average hourly wage in seven occupations in the construction industry sourced from ILO/OI1. In levels. Data available for 1936, 1938, 1940-42, 1946, 50-53, 55-65.

*1965 (in levels, circa values): uses the average hourly wage in seven occupations in the construction industry sourced from ILO/OI1.

1965-1980: index for real monthly wages in the construction sector from PREALC (1982).

1980-1993: index of monthly earning in the construction sector from Chile's Instituto Nacional de Estadísticas (INE website).

1993-2011: real average wage index (2000=100) from ECLAC website.

Skilled labour (w_2):

1900-1967: real skilled wage from Rodríguez Weber (2014) in escudos of 1960.

*1967 (in levels, circa values): monthly average salary for bank tellers and clerks (stock record) from ILO/OI2.

1967-2009: real skilled wage from Rodríguez Weber (2014) in escudos of 1960.

2009-2011: INE index of hourly earnings in manufacturing.

Deflators. when the original wage data are in nominal terms I use as deflator a CPI from the following sources:

1900-1928: Mamalakis (1983) - figures taken from MOXLAD.

1928-2011: INE website.

During the 1970-1977 period the original INE series was corrected using the information provided by Cortazar and Marshall (1980).

1971-1972: inflation in 1971 was calculated by applying the same adjustment used by Díaz, Lüders, and Wagner (2003) in the estimation of the December-December series. In 1972 a correction factor is applied to reflect the lower acceleration in annual inflation relative to the year-end values.

Colombia

Unskilled wages (w_4):

1900-01: equal to the 1902-1903 average.

1902-05: daily nominal wage for unskilled worker (*chapolero* – coffee grains collectors) in *Hacienda Jonás* - in Antioquia – from Palacios (1983).

1905-28: nominal wages for unskilled workers in the public sector (*peones de distrito*) from López Uribe (2008).

1928-1935: daily wages (*peon a destajo*) in the coffee sector from Thorp and Londoño (1984).

1935-1940: rural daily wages from Londoño (1995).

1940-1969: weighted average of two series from Jaramillo et al. (2000): i) rural daily wages (*jornales agrícolas sin alimentación ponderados por clima*); and ii) urban daily wages for unskilled construction workers (*ayudantes*) in Cali and Bogotá. Both series at 1988 prices. To estimate the weights for the two series I adjust the *RU%* in 1970 in line with changes in the rural population (this procedure results in a *RU%* in 1950 of 0.75).

*1969-1976 (in levels): weighted average of the real wage for the unskilled worker in agriculture (national level) and the minimum urban real wage. Both series at pesos of 1970 from PREALC (1982). The weight for *RU%* in 1970 = 0.65.

1976-2000: weighted average of two series: i) rural daily wages from Jaramillo et al. (2000); and ii) the income of the unskilled (with one to five years of schooling) for seven main cities (this uses household survey data on labour urban income according to years of education covering seven main cities (DANE website). From 1998 to 2000 growth with the unskilled income from seven main cities from Jaramillo et al. (2000). To estimate the weights for the two series I adjust the *RU%* in 1970 in line with changes in the rural population (this procedure results in a *RU%* in 2000 of 0.48).

2000-2011: overall real minimum wage index (2000=100) from ECLAC website.

Semi-skilled wages (w_3):

1900-05: grows in line with real GDP per capita (Bértola and Ocampo, 2012).

1905-29: average daily wages of semi-skilled workers in the Fenicia factory from Urrutia y Arrubla (1970).

1929-1977: average daily urban real wages (low-skills workers in the construction sector) from Jaramillo et al. (2000) in main cities: Barranquilla and Medellín in 1931-1938; and Barranquilla, Bogotá, Cali and Medellín from 1939 onwards.

1977-1982: uses household survey data on labour urban income with 6-10 years of education in seven main cities (DANE website). Original quarterly series are in current pesos.

*1982 (in levels): average wage in seven occupations in the construction industry from ILO/OI1. The value in 1982 following this procedure is very close to that calculated from the DANE household surveys for workers with 6 to 10 years of education.

1982-2000: as in period 1977-1982.

2000-2004: real average wage in construction and commerce from Urrutia and Ruiz (2010).

2004-2011: real average wage index (2000=100) from ECLAC website.

Skilled labour (w_2):

1900-05: grows in line with real GDP per capita (Bértola and Ocampo, 2012).

1905-28: nominal wages for relatively skilled workers in the public sector from López Uribe (2008). This average includes wages for clerical positions at the local and national government (cashiers, scribes, and senior officials - *official mayor*).

1928-62: Average real wage in industry from Echavarría (1999). This series includes three sectors: cement (men), textiles (women) and tobacco (men). In 1938-1939 only data on cement and tobacco is included to avoid a step change in the textile series.

1962-65: average hourly earnings in manufacturing from Mitchell (2003).

1965-80: average real wage in manufacturing at national level from PREALC (1982).

*1980 (in levels, circa values): monthly average salary for bank tellers and clerks (stock record) from ILO/OI2.

1980-2005: average real wage in manufacturing from Urrutia and Ruiz (2010).

2005-2011: index of average wages in manufacturing (including coffee processing) from DANE website.

Deflators:

1900-1905: CPI inflation estimates from López Mejía (1990).

1905-1950: CPI for Bogotá from López Uribe (2008).

1950-2011: CPI from Banco de la República website.

Mexico

Unskilled wages (w_4):

1900-10: wages for urban servants and rural day workers in pesos at 1900 prices sourced from Arroyo and Astorga (2016). To express the wages in PPP\$ of 1970 prices, I construct a ratio of the wage paid (expressed in US\$) to farm labourers around 1900 (United States Department of Labor, 1900) in Mexico to the average wage of the remaining five countries in my sample (LA-5) from the same source; and then apply this ratio to my average unskilled wage in PPP\$ of 1970 prices in the LA-5 circa 1900. Note that the wage estimation in 1900-1910 are not fully comparable with that after 1921.

1921-35: daily nominal minimum wage in agriculture from INEGI (1990).

1935-40: minimum nominal wage for regular day workers in agriculture from Mitchell (2003).

1940-65: a weighted average of two series: i) minimum nominal wage for regular day workers in agriculture from Mitchell (2003); and ii) the average of unskilled wages in four industries (construction, textiles, electricity, city council) from ILO/OI1. The data points are 1940-43, 1946, 1949, 1955, 1957-58, 1964-65. Otherwise interpolated. To estimate the weights, I adjust the $RU\%$ in

1970 (see below) in line with changes in the rural population (this procedure results in a $RU\%$ in 1950 of 0.77).

*1965-80 (in levels): weighted average of the minimum daily real wage in agriculture (national level) and the minimum urban real wage. Both series at pesos of 1970 from PREALC (1982). The value of $RU\%$ in 1970 is equal to 0.69.

1980-2000: weighted average of the minimum nominal wage for regular day workers in agriculture from Mitchell (2003) and the minimum urban real wage from ECLAC website. Between 1980 and 1982 it growth with series of unskilled workers in four sectors from ILO/OI1; between 1990 and 2000 the minimum rural wage grows in line with the average real wage in agriculture from ECLAC website. To estimates the weights, I adjust the $RU\%$ in 1970 in line with changes in the population in rural areas (this procedure results in a $RU\%$ in 1995 of 0.45).

2000-2011: average monthly earnings (pesos of 2014) for workers with primary education or less; sourced from Campos et al. (2015).

Semi-skilled wages (w_3):

1900-10: wages for masons in pesos at 1900 prices from Arroyo and Astorga (2016).

1921-34: real wage series for Mexico from Williamson (1998).

1934-1940: official minimum nominal wage from Wilkie (1974).

1940-1965: average wage of seven occupations in the construction industry from ILO/OI1. Data available for 1940- 43, 46, 49, 55, 57-58, 64-66.

*1965-1980 (in levels): ILO/OI1. Average wage over seven occupations in the construction industry. Data available for 1964-66, 72-76, 79, 81-82.

1980-1987: average wage in the construction sector from ILO Yearbook (various).

1987-2000: real average wage index (2000=100) from ECLAC website.

2000-2011: average monthly earnings (pesos of 2014Q4) for workers with secondary education; sourced from Campos et al. (2015).

Skilled labour (w_2):

1900-10: wages from administrative clerks in pesos at 1900 prices sourced from Arroyo and Astorga (2016).

1921-29: real weekly wages for textile workers in Veracruz mills in Gómez-Galvarriato (2002).

1929-34: rate of growth on nominal value added per economically active worker in manufacturing from MOXLAD. I could not find appropriate wage data for these years.

1934-41: index (1934=100) for industrial nominal salaries in Mexico City from Macín (1947).

1941-65: weekly nominal earnings in manufacturing from Mitchell (2003).

1965-68: average nominal monthly paid wages to blue-collar workers in manufacturing at national level from PREALC (1982).

*1968 (in levels, circa values): monthly average salary for bank tellers and clerks (stock record) from ILO/OI2.

1968-80: as in 1965-68.

1980-96: weekly nominal earnings in manufacturing from Mitchell (2003).

1996-2000: nominal earnings per month in manufacturing from ILO website.

2000-2011: average monthly earnings (pesos of 2014Q4) for workers with high school education; sourced from Campos et al. (2015).

Deflators.

1921-2011: uses CPI from MOXLAD up to 1995 and Banco de México website thereafter.

Venezuela

Unskilled wages (w_4):

1900-1936: wages for the unskilled rural are estimated using wage for rural workers available for benchmark years in circa 1900, 1912, 1920, 1928 (official minimum wage), and 1938. Figures in 1900 are sourced from Lucas (1991), in 1912 and 1920 from McBeth (2011), and in 1928 and 1936 from Valecillos (2007). Linear interpolation is used to fill the gaps between 1900, 1912, 1920, and 1928. I use pattern interpolation between 1928 and 1936 using as an auxiliary variable an index of economic activity from Vandellos (1941).

1936-74: weighted average of two series. First, annual real earnings in agriculture per employed person (at 1984 prices) from Valecillos (1990) after 1950. To estimate the 1936 value I use Valecillos (2007, Cuadro 2-9, 194) who reports monthly wages in agriculture in 1936 and 1959. The ratio between these two monthly values (=1.85) is applied to the 1959 annual earnings figure to extend the series backwards to 1936. Then I use linear interpolation between 1936 and 1950. Second, the real average unskilled wage in the construction industry calculated from hourly wages reported in ILO's October Inquiry. Data available for 1940, 42, 43, 45, 46, 51, 54-56, 58-66, 68, 71, 75.

Otherwise interpolated. The 1936 is estimated using proportionality with wages for unskilled workers in the food industry from Valecillos (2007). To estimate the weights I adjust the $RU\%$ in 1970 (see below) in line with changes in the rural population (this procedure results in a $RU\%$ in 1950 of 0.72).

*1974-75 (in levels): weighted average of the monthly rural real unskilled wage and the minimum urban real wage. Both series at bolivars of 1970 from PREALC (1982). The weight for $RU\%$ in 1970 is equal to 0.58.

1975-90: weighted average of two series: i) monthly real mean earnings per worker in agriculture at 1984 prices from Valecillos (1990). Values for 1981 and 1982 are interpolated; ii) real average wage of unskilled workers in the construction industry calculated from hourly wages reported in ILO/OI1. Data available for 1978, 81, 85, and 88. Otherwise interpolated. In 1988-1990 uses minimum urban real wage index (1980=100) from ECLAC website. To estimate the weights, I adjust the $RU\%$ in 1970 in line with changes in the rural population (following this procedure results in a $RU\%$ in 1995 of about 0.35).

1990-1997: overall real minimum wage index (2000=100) from ECLAC website.

1997-2011: index of real monthly wages in the retailing sector from the Venezuelan Central Bank (BCV) website.

Semi-skilled wages (w_3):

1900-1918: uses data available for urban workers in circa 1900, 1911 and 1921.

1918-1936: grows in line with GDP per worker in services calculated using national account estimates at 1968 prices between 1920 and 1936, and overall GDP per worker during 1900-1920 from (Baptista, 1997).

1936-1974: average hourly base-rate wage (largely in Caracas) for seven occupations in building industry from ILO/OI1 (reported in Valecillos, 1990). Data available for 1940, 42, 43, 45, 46, 51, 54-56, 58-66, 68, 71, 75, 78, 81, 85, and 1988.

*1974 (in levels): average hourly base-rate wage (largely in Caracas) for seven occupations in the building industry from ILO/OI1 (reported in Valecillos, 1990). The underlying urban unskilled wage is the minimum urban wage from PREALC (1982).

1974-1980: as in 1936-1974.

1980-1990: average annual salaries in the non-agriculture and non-oil economy (private sector) in Valecillos (1990).

1990-1997: average real wage index (1990=100) from ECLAC website. Between 1988 and 1990 uses rate of growth of manufacturing real wage.

1997-2011: average index of real monthly wages in the construction and retail sectors from the BCV website.

Skilled labour (w_2):

1900-35: calculated by applying ratios skilled/semi-skilled wages in the public sector from Carrillo Batalla (2002, 2003) to the estimates series of semi-skilled wages (see above). This source offers wage data every five years from 1900 to 1935. I use wages paid by the *Ministerio de Hacienda* (Treasury) and *Guerra y Marina* (Defence) to a number of clerical jobs. Semi-skilled occupations are taken to be the inspector of weights and measures (*fiel de peso*), archivist, and tax agent (*liquidador*); whereas skilled occupations are chief statistician, comptroller (*interventor*), accountant, and cashier. Although during the early decades of the last century the public sector accounted for a relatively small share of the labour force (about 5% according to Valecillos, 2007), the skill ratios calculated from wages in the public sector are roughly consistent with those derived from data on wages in the private sector compiled by Lucas (1991) for the first three decades of the last century (a skilled/semi-skilled ratio of about 2.5).

1935-61: I extend backwards the 1962 value to 1935 using the proportionality of data on real monthly wages in manufacturing in Valecillos (1990: Cuadro 2-9, 194) between 1936 and 1959 (=3.3). I then use pattern interpolation between 1935 and 1962 using as proxy the series of annual real salaries in the oil sector (Valecillos, 1990). In 1952 a skill ratio (=1.49) is calculated using ILO's data for construction workers and clerks. This ratio is then applied to the semi-skilled wage in that year to obtain an estimation for skilled wages.

1961-65: total nominal annual earnings in manufacturing from Valecillos (1990) using official data in 1961 and 1966 combined with series of money wages in industry from Mitchell (2003).

*1965-73(in levels): monthly average salary for bank tellers and clerks (stock record) from ILO/OI2.

1973-90: nominal annual earnings per worker in manufacturing as reported in OCEI industrial surveys (taken from Valecillos, 1990).

1990-97: index of real average monthly wages in manufacturing from ECLAC website.

1997-2011: index (1997=100) of real wages in manufacturing (private sector) from BCV website.

Deflators:

1900-1945: general price index from De Corso (2013).

1945-2011: CPI for Caracas metropolitan area from the BCV website.

II. Income per worker

II.1. Shares of the economically active population (EAP)

I follow two different procedures to estimate the shares of the EAP per each of the four occupational categories:

Period 1950-2011

The employment shares of the four groups are estimated by aggregating categories for the distribution of the EAP by occupational groups according to data collected by the International Labour Organization (ILO) and ECLAC. I use four different classifications:

1. ECLAC (2000). *Group 1*: employers, managers and professionals. *Group 2*: technicians and administrators (clerks). *Group 3*: urban workers (retailing and transport, excluding low skilled workers and street vendors), artisans and blue collar workers. *Group 4*: rural workers and personal services (includes domestic servants) plus low skilled urban workers and street vendors.
2. ILO, ISCO-88. *Group 1*: 1 legislators, senior officials and managers; 2 professionals
Group 2: 3 technicians and associate professionals; 4 clerks; plus 6 skilled agricultural and fishery workers. *Group 3*: 5 service workers and shop and market sales workers; 7 craft and related trade workers; 8 plant and machine operators and assemblers; 0 armed forces; *Group 4*: 9 elementary occupations; plus X not classifiable by occupation.
3. ILO, ISCO-68. *Group 1*: 0/1 professional, technical and related workers; 2 administrative and managerial workers. *Group 2*: 3 clerical and related workers; 4 sales workers (only half of this). *Group 3*: 4 sales workers (the other half of this); 7/8/9 production and related workers, transport equipment operators and labourers; X not classifiable by occupation. *Group 4*: 5 Service workers; 6 agriculture, animal husbandry and forestry workers, fishermen and hunters.
4. PREALC (1982). *Group 1*: 0 professional, technical and related workers; 1 managerial workers. *Group 2*: 2 clerical and related workers; 3 sales workers (only half of this). *Group 3*: 3 sales workers (the other half of this); 5 transport; 6-7 artisans and blue collar workers. *Group 4*: 4 agriculture; 8 service workers.

I use simple interpolation to fill the gaps in each of the occupational structures calculated with the above sources. I take the ECLAC figures for circa 2000 to set the share levels and then go backwards using information on changes in each of the four categories provided by the additional three classification systems (in ISCO-88, ISCO-68 and PREALC). To splice series from two different occupational structures I use a common year and then apply rate of changes to go backwards. The data available in each of the classifications by country are as follows.

Argentina. ISCO-88 in 1998-2006. PREALC (1982) in 1960, 1970. Interpolations: 1960-70. 2000-06: uses ISCO-88 with a correction for the methodological break in 2003. **Brazil.** ISCO-88 in 2000, 2002-07. ISCO-68 in 1981-90; 1992-93; 1995-99; 2001, 1971, and 1983 (in ILO Yearbooks) and 1976-2006 available online. PREALC (1982) in 1950, 1960, 1970. Interpolations: 1951-59; 1961-69; 1991; 1994; 2000.

2000-07: uses ISCO-88. Shares in 2000 and 2001 are as in 2002. **Chile.** ISCO-88 in 2002. ISCO-68 in 1960, 1971, and 1983 (in ILO Yearbooks), and 1976-2006 available online. The categories “mining” and “armed forces” are included in Group 3. PREALC (1982) 1952, 1960, 1970. In 1952 the total of categories 0 to 3 are split according to the structure in 1960. Interpolations: 1953-59; 1961-70; 1972-75. 2000-08: uses ISCO-68.

Colombia. ISCO-68 in 1975-80; 1985-87; 1989-90; 1992-2000; 2001-08. Data exclude the armed forces and are based on surveys on seven main cities. PREALC (1982) and ILO (various yearbooks) in 1951, 1964, 1973 (only ILO), and 1980. In 1951 the categories “managerial workers” and “clerical

and related workers” are split according to the structure in 1964. Interpolations: 1952-63; 1965-72; 1974-79. 2000-08: uses ISCO-68. Shares in 2000 are as in 2001. **Mexico.** ISCO-88 in 2000. ISCO-68 in 1988; 1991; 1993; 1995-2008. PREALC (1982) and ILO (yearbooks, compatible with ISCO-68) in 1950, 1960, 1970, 1975 (ILO), 1980 (ILO). Interpolations: 1951-59; 1961-69; 1971-74; 1976-79; 1981-87. 2000-08: uses ISCO-88. **Venezuela.** ISCO-68 in 1976-2008. PREALC (1982) and ILO (yearbooks, compatible with ISCO-68) in 1950, 1961, 1971 (ILO), 1981 (ILO). In 1950 the categories “professionals”, “managerial workers” and “clerical and related workers” are split according to the structure in 1961. Interpolations: 1951-60; 1962-70; 1972-80. 2000-08: uses ISCO-68.

In all six countries for the final years of the current century the estimation is as follows: shares of Group 1 are kept equal to the last data point; those of Group 2 are estimated based on changes in the EAP share of manufacturing (ECLAC website); for Group 4, I use changes in the EAP share of agriculture; shares for Group 3 are estimated as a residual.

Period 1900-1950

To complete the employment shares back from 1950 to 1900 I rely on changes in three indicators constructed by FitzGerald (2008) as follows: **Group 1**, the stock of university graduates as a proportion of the total of those with primary education. The stock of educational graduates is estimated using the perpetual inventory method applied to the data on enrolment in primary and tertiary education.⁵ **Group 2**, total employment in manufacturing and public administration as a proportion of the EAP. Manufacturing employment comes from census data and public administration employment is estimated from levels of government expenditure. **Group 3** is estimated as the residual from the other three groups. **Group 4**, the agricultural EAP share from census data. This includes not only agricultural workers as such, but also small farmers (i.e. peasants) and family labour on a non-wage basis.

II.2. National income

Ideally, I need to estimate national income deflated by the CPI so as to be consistent with the real wage series. This is done in two steps:

1. The original GDP series at 1970 prices are multiplied by a ratio of the implicit deflator to the CPI.
2. To convert the CPI deflated GDP series into National Income - when data or estimates are available - I construct a ratio of National Income to GDP and apply that ratio to the GDP series. In general, such a ratio is calculated using the data on both National Income and GDP available at ECLAC website (usually from 1970 onwards) and then I complete the series back to 1950 from other sources. During the period 1900-50, I rely on the growth rates of the unemployment-adjusted GDP series (see below).

To obtain the relative income levels, I need average overall income per worker series consistent with my wage data. I proceed as follows. First, I calculate a weighted average monthly wage from my series in 1970 (using the groups’ EAP shares as weights). Second, I use estimates of the wage share of total national income in 1970 in order to calculate an average income per worker value in such a year consistent with my estimated average wage level. Then I use the growth rate of the unemployment-adjusted income per worker (at 1970 prices) series to go back to 1900 and forth to 2011. The level adjustment performed in 1970 is also used to calibrate my series and to take into

⁵ Is this a reasonable proxy? To provide an answer I made a calculation using data of professionals and managers (P&M) in the LA6 around 1950 from PRELAC (1982). First, I added up the EAP shares for both categories. Second, I assumed that all professionals had tertiary education and that 30% of managers had it (a conservative assumption). Third, with those weights, about 60% of the EAP of P&M had tertiary education. Therefore, this proxy capture reasonably well changes in Groups 1’s EAP back to 1920.

account some of the fringe payments that are included in the labour share on overall income but that are largely excluded from my wage data.

Sources for National Income: **Argentina:** 1993-2011 uses ECLAC website; 1950-1993 uses estimates in Kacef and Manuelito (2008). **Brazil:** IBGE from 1947 to 2011. **Chile:** 1960-2011 uses ECLAC website; 1950-60 uses estimates in Kacef and Manuelito (2008). **Colombia:** 1970-2011 use ECLAC website; 1962-70 uses ILO yearbooks; 1950-62 uses estimates in Kacef and Manuelito (2008). **Mexico:** 1970-2011 uses ECLAC website; 1950-70 uses estimates from Kacef and Manuelito (2008). **Venezuela:** 1998-2011 uses ECLAC website; 1950-98 uses BCV website (Venezuela Central Bank).

Sources for GDP at constant prices and CPIs: Chile 1900-1940, I deflate the nominal GDP series in Haindl (2006) with the CPI. Mexico 1900-1910 uses *Estadísticas Económicas del Porfiriato* available at the ITAM webpage. For Venezuela I use De Corso (2013). Otherwise I use MOxLAD.

II.3. EAP adjustment ⁶

There is a potential bias when estimating income ratios by dividing the wage series by the income per person engaged. The former largely reflects the income of those employed, whereas the latter takes into account the unemployed and underemployed. Thus, at times of high employment losses, my series would overestimate r_2 , r_3 , r_4 , and underestimate r_1 , thus underestimating inequality. In order to minimise the potential impact of this bias, where data allow, I make an adjustment to the income per person engaged according to the following procedure:

1. I collect data, where available, on unemployment rates and on total employment series (EMP). With the latter I calculate unemployment rates as $(1-EMP/EAP)$, and then use changes of these series to extend backward published unemployment rates.
2. I calculate a long-term unemployment rate as a proxy for the natural rate as a 9-year moving average of the yearly unemployment rates. High unemployment rates are smoothed out from the original series.
3. I calculate deviations between yearly unemployment rates and long-term rates, and omit negative values. Those deviations are then multiplied by the original EAP series to have a gross estimate of the number of unemployed people relative to the long-term rate, which are then subtracted from the total EAP to obtain adjusted EAP series. Working with deviations is also convenient to avoid differences across countries in the calculations of unemployment rates.
4. A ratio of the original EAP series and the adjusted EAP series is then applied to the series of income per person engaged.

The ECLAC website is the source for unemployment rates in 1980-2011 in all six countries. For the remaining years sources are as follows: **Argentina:** 1970-80 ILO website. Elias (1992) total employment estimates from 1944 to 1970. There is no reliable evidence to make an adjustment during the 1930s. **Brazil:** 1977-80 ILO website. In 1930-36 I apply an adjustment based on the inverse of the economic activity indicator in Abreu (1990, Anexo Estadístico). **Chile:** 1975-80 ILO website. In 1930-35 it uses as proxy data on “applicants for work” from the League of Nations website. **Colombia:** 1975-80 ILO website, and 1950-1974 Londoño (1995). There is no reliable data during the 1930s. **Mexico:** 1973-80 ITAM website. Elias (1992) total employment estimates from 1950 to 1973. In 1931-42 it uses official estimates reported in Keesing (1977). **Venezuela:** 1928-29, 1934-80 uses unemployment rates in Valecillos (2007). The 1930-1933 gap is filled with pattern interpolation using as auxiliary series the inverse of the Vandellos’ economic activity index in Valecillos (2007, 82).

⁶ This section was updated in November 2023.

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