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**REAL WAGES AND SKILL PREMIUMS
DURING ECONOMIC DEVELOPMENT IN
LATIN AMERICA**

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Real Wages and Skill Premiums during Economic Development in Latin America

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Abstract

This paper discusses and documents a new dataset of real wages for unskilled, semi-skilled, and relatively skilled labour in Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela (LA-6) over the period 1900-2011. Three interrelated aspects are examined: the wage growth record associated with periods dominated by a particular development strategy; wage convergence across the LA-6; and changes in wage skill premiums and their links with fundamentals. The key findings are: i) the region's unskilled wage rose by 147% in the period compared to rises of 243% in the average wage and 440% in income per worker (including both property and labour income); ii) there is a limited process of wage convergence across the LA-6; and weak persistence in the country hierarchy; iii) skill premiums tended to peak during the middle decades of the 20th century, coinciding with the acceleration of industrialisation and the timing of the demographic transition. Movements in the terms of trade are broadly associated with both fluctuations and trends in wage premiums, though the direction of the link is country and time specific.¹

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1. Introduction

This paper discusses and documents new yearly series of real wages in six leading Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico and Venezuela, or LA-6) during the period 1900-2011. These countries accounted regularly for about three-quarters of Latin America's population and GDP during the period, and thus can be taken to represent the region as a whole. The assembled dataset includes three skill levels in the labour force (unskilled, semi-skilled, and relatively skilled workers), offering comparable series across countries consistently defined over time. This makes it possible to identify common trends and diversity in the evolution of real wages and wage differentials over the long run, and to explore the impact of major transformations occurring in the region such as urbanisation and industrialisation, changes in international integration, human capital formation, and the demographic transition.

The study of real wages and wage differentials at a multi-country level from a historical perspective has been the focus of attention of previous scholars such as Ericksson (1966) and Berg (1968) who studied the period between late 1930s to early 1960s, with particular attention to development in the wage structure, while Salazar-Carrillo (1977) studied wage differentials in manufacturing in eleven countries (including my LA-6) during the late 1960s. More recently, Williamson (1999) assembled series for unskilled wages in Argentina, Brazil, Colombia, Mexico and Uruguay to study catching up and income inequality during the first globalisation wave. Frankema (2010) constructed long-run series of unskilled (rural and urban) and manufacturing wages and labour shares over the 20th century for Argentina (post 1913), Brazil (post 1920) and Mexico (post 1900); and Frankema (2012) examined in depth trends in industrial wage inequality in Argentina, Brazil and Chile between 1910 and 2000. But there is a lack of a study covering, in a continuous and consistent fashion, wage developments in a sufficient number of countries over a long time horizon so as to provide a broad perspective – a glimpse at the big picture - of the region.²

In the task of assembling the dataset, I have benefited greatly from recent efforts of Latin American economic historians in constructing long-term wage series at country level. For example, Matus (2009) and Rodríguez Weber (2014) for Chile; Urrutia and Ruiz (2010), López Uribe (2008) and Jaramillo, Nupia and Romero (2000) for Colombia; and Valecillos (2007) for Venezuela. This dataset has already been used to estimate for the first time between-group earnings inequality Ginis over the 20th century for the LA-6 (Astorga, 2016, 2017; Arroyo and Astorga, 2016). Here I continue this research agenda by exploring three interrelated aspects. First, the wage record and any patterns associated with periods dominated by a particular development strategy. Secondly, wage convergence across the LA-6. It is of interest to know if convergence in living standards (Astorga, Bergés, FitzGerald, 2005) has also been reflected in real wages; or the extent of wage equalisation during periods of closer trade integration (as predicted by the Heckscher-Ohlin model). Thirdly, wage differentials, focusing on the skill-unskilled ratio (the wage skill premium) as this is the ratio most commonly studied in the literature.³ Did the structural change bring about a widening in wage skill premiums? What was the role played by the demographic transition and the terms of trade?

² This brief recount of the empirical literature excludes works that deal with the post 1980 years or so adopting an econometric approach (e.g., De la Torre et al., 2012; Gasparini et al., 2011; Manacorda et al., 2010). Also, there is a considerable number of wage studies at a country level - many of them are quoted in the Appendix.

³ This wage ratio also tracks well developments on wage dispersion (coefficient of variation of the three wage series). The LA-6 average correlation between both measures over the whole period is 0.86.

The key findings are: i) despite a nearly 147% rise in unskilled wages for the LA-6 average between 1900 and 2010, they lagged behind advances in average wages (up 243%) which, in turn, lagged behind growth in income per worker (440%);⁴ ii) there is a limited process of wage convergence across the LA-6, with significant changes in the country hierarchy; iii) wage skill premiums tended to reach a maximum during the middle decades of the 20th century, a result consistent with the acceleration of industrialisation and the timing of the demographic transition. Movements in the terms of trade are broadly associated with both fluctuation and trends in premiums, though the direction of the link is country and time specific.

1.1. Transformations and periodisation

Table 1 summarises key transformations that occurred in the LA-6 since 1900 in GDP per capita, urbanisation, schooling, and population growth which are likely to have had a significant impact on supply and demand condition in the labour market. The circa years of 1940 and 1980 correspond to inflexion points (preceding an acceleration in the first date, and levelling off in the second) in the first three variables (Astorga, Bergés, FitzGerald, 2005). This periodisation defined in terms of the integration to the world economy also reflects the adoption of particular growth strategies, and follows a tradition of economic historians studying the region (e.g., Bértola and Ocampo, 2012; Bulmer-Thomas, 2013; Thorp, 1998). Roughly speaking, 1900-1940 (or early period) includes the end of the first globalization wave (about 1860-1915) and the transition years of the 1920s and 1930s; 1940-1980 (middle period) covers the core years of state-led industrialisation under protection; and 1980-2011 (final period) is dominated by structural reforms and export-led growth.

Table 1: Key transformations in the LA-6, 1900-2011

| | GDP per capita (US\$ PPP at 1990 prices) | | | | Schooling (average years) | | | | Urbanisation (percentage) | | | | Population (annual growth rates) | | |
|------------------|---|------|-------|-------|------------------------------|------|------|------|------------------------------|------|------|------|-------------------------------------|---------|-----------|
| | 1900 | 1940 | 1980 | 2010 | 1900* | 1940 | 1980 | 2010 | 1900 | 1940 | 1980 | 2010 | 1901-39 | 1940-79 | 1980-2011 |
| Argentina | 2941 | 4387 | 8178 | 11378 | 2.7 | 4.4 | 7.4 | 8.5 | 46 | 60 | 83 | 91 | 1.2 | 0.7 | 0.5 |
| Brazil | 583 | 1176 | 4944 | 6555 | 1.7 | 2.1 | 4.1 | 7.8 | 23 | 31 | 68 | 85 | 0.9 | 1.1 | 0.7 |
| Chile | 2260 | 3256 | 5633 | 12963 | 2.7 | 4.5 | 8.1 | 10.3 | 44 | 51 | 81 | 88 | 0.6 | 0.9 | 0.6 |
| Colombia | 681 | 1865 | 4220 | 6885 | 2.1 | 3.6 | 5.7 | 8.3 | 11 | 31 | 66 | 74 | 0.8 | 1.2 | 0.8 |
| Mexico | 1367 | 1821 | 6183 | 7665 | 1.2 | 2.3 | 5.8 | 8.2 | 22 | 35 | 66 | 79 | 0.6 | 1.4 | 0.7 |
| Venezuela | 806 | 3112 | 10285 | 9576 | 1.2 | 1.8 | 6.2 | 7.1 | 11 | 32 | 74 | 93 | 0.4 | 1.5 | 1.0 |
| LA-6 | 1440 | 2603 | 6574 | 9170 | 1.9 | 3.1 | 6.2 | 8.4 | 26 | 40 | 73 | 85 | 0.8 | 1.1 | 0.7 |
| dipersion | 0.67 | 0.46 | 0.34 | 0.28 | 0.35 | 0.38 | 0.22 | 0.13 | 0.59 | 0.31 | 0.11 | 0.09 | 0.39 | 0.25 | 0.24 |

LA-6: simple average. Dispersion is measured by the coefficient of variation. Population rates are constant annual growth rates. (*): uses literacy rates to project average years of schooling from 1940 back to 1900. Sources: for schooling 1940-2010, Morrison and Murtin (2009), except Colombia from Bértola, Hernández, and Siniscalchi (2012). Urbanisation, literacy and population from Astorga, Bergés, and FitzGerald (2005) from 1900 to 2000; official sources thereafter. GDP per capita from Bértola and Ocampo (2012).

The LA-6 average GDP per capita rose by 81% between 1900 and 1940 (ranging from 33% in Mexico to 286% in Venezuela), by 153% between 1940 and 1980 (ranging from 73% in Chile to 321% in Brazil), and by 40% between 1980 and 2011 (ranging from a 7% fall in Venezuela to a

⁴ This is calculated with aggregate national income, completed when necessary with rate of growth of GDP. It also uses the economically active population - adjusted by unemployment when possible - to calculate per head values. The deflator is the consumer price index (see Astorga, 2015).

130% rise in Chile). The LA-6 average GDP per capita over the whole period increased by 537%, meaning that the living standards of an average person in the region rose by nearly 6.5 times between 1900 and 2010. In general, population (and, with a lag, the labour force) experienced moderate growth in the LA-6 during the first period (an average annual rate of 0.8%), with Argentina and Brazil leading the expansion partly as a result of significant immigration in the early decades. The expansion of population accelerated in the 1940-79 period (1.1%), led by growth rates in Mexico and Venezuela. From 1980 onwards the region experienced a slowdown in population growth (0.7%).

Along the 20th century the LA-6 underwent a rapid process of urbanisation and internal migration, particularly in Brazil, Colombia, Mexico and Venezuela. By 1980 more than 70% of the LA-6 population lived in cities, compared to only 26% in 1900. This process was accompanied by accelerated industrialisation up to the 1980s, and then de-industrialisation during the final two decades of the last century (Thorpe 1998). The transition from a largely rural society at the start of the century (less so in Argentina and Chile) to a predominantly urban one by 2000 brought about, first, the widening of the rural-urban divide and, later on, the emergence of a formal-informal urban divide. In both cases, differences in productivity and restrictions in access to formal jobs were at the root of wage disparities.

The LA-6 average schooling (years of education) increased by 1.1 years between 1900 and 1940 (led by Argentina and Chile), and registered a substantial gain of 3.1 years between 1940 and 1980 (led by Venezuela and Chile). The advances in schooling slowed down to 2.2 years (with Brazil, Colombia and Mexico catching up) in the final period partly reflecting an upper limit in this variable. This outcome is in tune with the process of skills formation in the region. According to my estimates, at the start of the 20th century the unskilled accounted for about 40% of the labour force in the more advanced economies of Argentina and Chile and around 70% in the other four economies (Astorga, 2015). By 1980 that share came down to about 20% in Argentina, Chile and Venezuela, and to about 40% in Brazil, Colombia and Mexico. The combination of the expansion of the labour force, advances in education and the demand for skills associated with technological change have the potential to move wage premiums either way (Tinbergen, 1975).

The adopted periodisation also reflects important changes in the degree of integration in the labour market as well as in its institutions. Broadly speaking: i) reduced integration and limited wage-based labour prevailed in the first period (favouring high wage gaps); ii) a more integrated and wage-based labour market developed amid a higher level of labour-market regulation during the second period (a force for reducing wage gaps); iii) a well-integrated and wage-based labour market arose amid deregulation and growing informality in the final period (overall, favouring higher differentials). The 1940s witnessed the introduction of minimum wage legislation in the LA-6 (earlier in Mexico).⁵ The influence of unions in wage negotiations also rose in the middle decades. However, the structural reforms implemented during the 1970s and 1980s undermined minimum wages – and wages in general – and the influence of unions (Roberts, 2012).⁶

⁵ Argentina set up a body in 1946 to deal with minimum wages. Brazil established a national minimum wage in 1938. Chile introduced schemes to regulate minimum wages for private employees and for industrial workers in 1942 (and in 1934 for nitrate workers). Colombia, established the principle of minimum wage in 1945, and applied it in 1949. Mexico included the minimum wage principle in the 1917 Constitution, and a national fixing body started its operations in 1931. Venezuela passed minimum wage legislation in 1945 for specific industries, but it was not until 1974 that a general minimum wage was introduced. See Méndez (1950).

⁶ There is evidence confirming the influence of minimum wages on the unskilled wages and, more generally, on the wage structure. For instance, Camargo (1984) in Brazil in the period 1940-1980; Fairris, Polpi, Zepeda (2008) in Mexico

It is expected that, over the long run, real wages would have advanced in line with GDP per capita and labour productivity (particularly under the assumption of well-functioning labour markets) and a better educated labour force. As to regional convergence, the gradual process of increasing structural similarities (as reflected in the fall in dispersion in the four variables included in Table 1) and increased trade integration since the 1980s is expected to have supported wage convergence. Also, the levelling off in educational performance in the closing decades of the 20th century (Frankema, 2009) should have contributed to narrow wage gaps across the LA-6. Meanwhile, the structural change associated with urbanisation and industrialisation is likely to have had an impact on wage differentials. One working hypothesis is that skill premiums rose in the middle period driven by industrialisation amid labour surplus (as in the standard Kuznets-Lewis process); and also by the impact of high population growth rates in the 1950s and 1960s – expanding the supply of unskilled labour in the 1970s.

However, there are differences in this group of countries that could have favoured divergence. For instance, in the timing of the demographic transition (early in Argentina and Chile, later in the remaining four countries); or variations in the level of government intervention in the labour market. One key finding in Frankema (2012) is that different political-institutional conditions and reforms – especially in the second half of the last century - determined particular outcomes in wage inequality in Argentina, Chile and Brazil. Meanwhile, the nature of the main commodities exported has an influence on the demand for skills in the export sector.⁷ And movements in the terms of trade can translate into changes in the real exchange rate – e.g., via the spending of export-based fiscal revenues – with implications for the relative skills demand for skills and wage differentials in the wider economy.

Furthermore, contrasting inflation trajectories may also have been a force for country diversity in wage differentials. Argentina, Brazil and Chile were especially prone to price instability in the second half of the last century with hyperinflation bouts during the 1970s and 1980s in Argentina, Brazil and Chile. This record contrasts with one of relative price stability in Colombia after 1904 (though with persistently moderate levels of inflation), Mexico (from 1920 to the 1970s) and Venezuela (before 1990). To the extent that workers in the urban formal sector are better protected against inflation, and that low-skill workers dominates in the rural and informal sectors, inflation would result in widening wage differentials.⁸

The rest of the paper is organised as follows. Section 2 describes the procedure followed in assembling the wage series and offers level comparisons around 1900 and 2000 with wage and income ratios from alternative sources. Section 3 looks at the growth wage record and the process of convergence across the LA-6. Section 4 deals with wage skills premiums and their links with key drivers. Section 5 offers conclusions. There is an annex with additional tables and charts by country. An Appendix gives details on procedures and sources by country.

during the 1980s and early 1990s; and Kristensen and Cunningham (2006) in a cross country study covering 19 Latin American and Caribbean countries in the late 1990s.

⁷ The top five commodities represented over 50% of total exports in Argentina and Brazil up to circa 1970, and in Mexico up to 1940; and over 70% in Chile up to 1975, in Colombia up to 1970, and in Venezuela up to 2011 (author's own calculations). The two dominant commodities over the whole period were meat and wheat in Argentina, coffee and cotton in Brazil, copper and nitrates in Chile, coffee and oil in Colombia, silver and oil in Mexico, coffee and oil in Venezuela (Thorp, 1998, Statistical Appendix).

⁸ See Bullr (2001) for evidence of a positive link between inflation –and specially hyperinflation - and income inequality in 80 countries over the period 1970-1991.

2. Methodology

To define wages by skill level, I rely on the four broad occupational groups used by ECLAC (2000), namely: group 1 (employers, managers, and professionals), group 2 (technicians and administrators), group 3 (semi-skilled blue collars workers, other urban workers in relatively low productivity sectors such as retailing and transport, and artisans), and group 4 (rural and urban unskilled workers—including domestic servants and street vendors). I lack enough data to assemble the corresponding wage series for professionals, therefore bear in mind that my “skilled wage” excludes highly skilled workers. In accordance with the above breakdown of the economically active population (EAP), I denote the three wage series as w_2 (skilled), w_3 (semi-skilled), and w_4 (unskilled). The missing wage series w_1 stands for highly skilled workers. No allowances are made for fringe earnings (e.g., overtime pay and productivity bonuses); therefore, my series must be taken as a lower bound value of labour earnings in the three lower occupational groups.⁹ It needs to be stressed that all series are subject to estimation shortcomings – with different degrees of severity depending on the country and period –with changes in definitions, sources, and coverage. The ideal uninterrupted series of one source, one definition, reflecting the appropriate skill level for the whole period does not exist at present, and is unlikely to exist in the future. In general, the 1900-1940 period faces higher data limitations in terms of availability and quality. Argentina and Chile tend to have more and better data, while Venezuela is the country with less data and poorer quality in this period. Wage gaps by occupational categories should largely reflect differences in education and experience. The deeper causes are to be found in factors such as labour productivity, labour supply conditions (e.g., education and migration costs), as well as imperfections in the labour market.

I rely on representative wages or wage averages in order to deal with the complexity and diversity within a given occupational group in terms of skills, experience, gender, sectors (e.g. tradable and non-tradable), and location (rural and urban areas, and regions). And there is always the risk of missing out important variations or wage developments within a group or across space.¹⁰ To deal with the urban-rural divide, during most of the period the unskilled wage is constructed as a weighted average of both rural and urban wages (Argentina post 1936; Brazil post 1958; Chile post 1900; Colombia post 1940; Mexico in 1900-1910 and after 1940; Venezuela post 1936). After 1940 or so, semi-skilled wages tend to reflect urban wages in the construction sector. Prior to that they are predominantly rural wages (e.g., Brazil) or urban ones (e.g., Chile), depending on the urbanisation level of the country. Wage series for the relatively skilled tend to refer to urban jobs in banking, manufacturing or the public sector.

To assemble the three wage series in a comparable and consistent manner, I first set the levels in the core period (usually within 1965 and 1980) using data in PREALC (1982) and the

⁹ According to ILO’s October Inquiry, in Chile fringe earnings (calculated as the difference between the hourly wage rate and hourly earnings) represented, on average, about 16% of total earnings for workers in the construction sector in the period 1953-1959; and in Venezuela they represented about 20% in 1981. Eriksson (1966) found that in Chile, Colombia and Venezuela during the middle decades of the last century skills differentials measured by total remuneration were either close to or greater than differentials measured in basic wages.

¹⁰ There is complementary evidence for Brazil (rural wages in 15 states in 1911, 1921, and 1936-37), Colombia (rural workers in 17 *departamentos* in 1940-1998, and unskilled building workers in four main cities in 1948-1982), and Mexico (official minimum wages in 32 states in 1934-1985) indicating a tendency towards relatively rapid wage convergence within regions during the first half of the 20th century. See Astorga (2015).

International Labour Organization (ILO)’s October inquiry;¹¹ and, then, proceed to complete the series back and forth by using rate of growth of a selection of wage series from various sources. When alternative series are available for a country in a given period, my preferred option is that which better matches the skill definition and that offers a longer time coverage. To have wages in a single currency across countries I calculate purchasing power parity (PPP) values using the PPP exchange rates to the US dollar available for circa 1970 (ECLAC, 1978). See the Appendix for estimation details.

2.1. Level comparisons

Relying on growth rates to estimate levels outside the core period has the advantage of using available series from sources that are not always covering my three skills categories in a given country or that cover different sub-periods. The main drawback to this procedure is that the margin of error of growth changes can accumulate over time, potentially creating problems with keeping the “true” wage differentials both within and between countries, especially as I go back in time. However, there is some additional evidence (not used in the construction of my wage series) on wages and GDP per capita that could serve the purpose of assessing the plausibility and internal consistency (both within and between countries) of the levels estimated outside the core period. This involves comparing my wage ratios for a given country with the alternative estimates, as well as checking the relative country positions in benchmark years.

Table 2: Wage ratios for selected sources and years

| <i>ratios</i> | Argentina | | Brazil | | Chile | | Colombia | | Mexico | | Venezuela | |
|---|-----------|------|--------|------|-------|-----|----------|-----|--------|-----|-----------|-----|
| | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) |
| Astorga <i>original series in:</i> | | | | | | | | | | | | |
| c.1900 monthly wages, | 1.6 | 2.0 | 2.0 | 4.3 | 2.4 | 4.8 | 2.1 | 4.7 | 2.7 | 4.5 | 1.7 | 3.1 |
| c.2000 LC 1970 prices | 1.9 | 3.5 | 2.9 | 5.6 | 2.4 | 3.7 | 2.0 | 3.3 | 3.3 | 5.2 | 1.7 | 3.2 |
| US Department of Labor | | | | | | | | | | | | |
| c.1895 daily wages, US | 1.8 | | | | 3.0 | | 2.6 | | 4.3 | | 3.0 | |
| c.1900 dollars | | | 3.6 | | 2.7 | | | | | | | |
| Arroyo | | | | | | | | | | | | |
| c.1900 monthly wages, LC | 1.7 | 2.3 | n.a. | n.a. | 1.8 | 4.8 | 2.5 | 3.0 | 2.7 | 4.5 | 2.1 | 5.2 |
| ECLAC | | | | | | | | | | | | |
| c.2000 annual labour | | | | | | | | | | | | |
| income, LC | n.a. | n.a. | 2.4 | 4.9 | 2.3 | 5.4 | 1.7 | 3.8 | 2.3 | 5.4 | 2.1 | 4.3 |

(1): semi-skilled to unskilled wages (w_3/w_4); (2): skilled to unskilled wages (w_2/w_4). LC: local currency; n.a.= not available. ECLAC: proxies for w_2 = professionals and technicians; w_3 = mean income private sector; w_4 =domestic servants. Sources: see main text.

Table 2 offers a comparison of wage ratios around 1900 and 2000. First, there are daily wages in US current dollars around 1895 and 1900 from establishment-level surveys compiled by the United States Department of Labor (USDL) in 1900 (used in Huberman and Lewis, 2007). I take the average wage paid to “farm laborers” and “carpenters and joiners” – which can be representative of unskilled and semi-skilled wages respectively – and calculate country ratios in 1895 or 1900, depending on data availability. Secondly, there are alternative wage ratios covering the three skill

¹¹ PREALC (*Programa de Empleo para América Latina y el Caribe*) is ILO’s division for Latin America. Thus, in both cases, I am relying on official data compiled by ILO.

categories for the second half of the 19th century in Arroyo and Astorga (2016), which offer comparisons around 1900.¹² For the end of the 20th century a comparison can be made with ratios calculated from mean labour incomes according to occupational categories based on household surveys (ECLAC, 2016) – but bear in mind that in this case the comparison is between wages and labour income (including fringe payments) based on different statistical sources.

Comparisons with USDL show relatively nearby (within the $\pm 15\%$ interval) semi to unskilled ratios in Argentina, Chile and Colombia. For Brazil, Mexico and Venezuela this source shows higher ratios (outside the $\pm 15\%$ interval).¹³ Comparisons with Arroyo’s figures show nearby w_3/w_4 ratios in Argentina, Venezuela and Colombia (in this case within the $\pm 20\%$ interval). My ratios for Mexico use Arroyo’s. As to w_2/w_4 ratios, there are nearby values in Argentina and Chile;¹⁴ but Arroyo’s ratio is significantly higher in Venezuela (5.2 vs. 3.1) and lower in Colombia (3.0 vs. 4.7). Comparison in 2000 show nearby w_3/w_4 ratios in all cases except Mexico (3.3 vs 2.3). And for w_2/w_4 ratios, there are consistent values in Brazil, Colombia and Mexico, but significant discrepancies in Chile (3.7 vs. 5.4) and Venezuela (3.2 vs. 4.3).

Table 3: Country hierarchy in selected variables circa 1900

| | Argentina | | Brazil | | Chile | | Colombia | | Mexico | | Venezuela | |
|-------------------------------|---------------------|----------|------------------------------|----------|-------|----------|----------|----------|--------|----------|-----------|----------|
| | US\$ per day | | Ratios relative to Argentina | | | | | | | | | |
| | level | rank | ratio | rank | ratio | rank | ratio | rank | ratio | rank | ratio | rank |
| <i>US Department of Labor</i> | | | | | | | | | | | | |
| farm labourers 1895 | 1.3 | 1 | 0.20 | 6 | 0.40 | 3 | 0.32 | 4 | 0.24 | 5 | 0.41 | 2 |
| carpenters 1895 | 2.4 | 1 | 0.38 | 6 | 0.65 | 3 | 0.46 | 5 | 0.57 | 4 | 0.68 | 2 |
| engineers 1885 | 4.1 | 3 | 0.62 | 5 | 1.09 | 1 | 0.61 | 6 | 0.91 | 4 | 1.04 | 2 |
| <i>Astorga c.1900</i> | US\$ of 1970, month | | Ratios relative to Argentina | | | | | | | | | |
| unskilled | 37 | 1 | 0.42 | 5 | 0.68 | 2 | 0.34 | 6 | 0.47 | 4 | 0.48 | 3 |
| semi-skilled | 62 | 2 | 0.47 | 5 | 1.24 | 1 | 0.40 | 6 | 0.72 | 3 | 0.68 | 4 |
| skilled | 76 | 4 | 0.84 | 5 | 1.49 | 1 | 0.75 | 6 | 1.024 | 2 | 1.019 | 3 |
| income per worker | 83 | 1 | 0.30 | 6 | 0.55 | 2 | 0.40 | 5 | 0.48 | 3 | 0.42 | 4 |
| GDP per capita | 34 | 1 | 0.23 | 6 | 0.70 | 2 | 0.27 | 5 | 0.48 | 3 | 0.29 | 4 |

Engineers: including railroad(r), marine(m), stationary(s) in Colombia and Mexico; r&s in Argentina and Brazil; r&m in Venezuela; m in Chile. Sources: farm labourers, carpenters, and engineers from US Department of Labor (1900). GDP per capita from Astorga et al. (2005). Income per worker from Astorga (2015). Otherwise see the Appendix.

Table 3 presents wages for the three skills categories and GDP per capita and my estimates of income per worker circa 1900 using Argentina as numeraire. Also, for each variable, the countries are ranked from first to sixth position. The first comparison is between relative ratios calculated with wages sourced from the USDL (circa 1895) for unskilled farm workers and carpenters and those using my unskilled and semi-skilled wages around 1900. For “farm laborers” and my unskilled wage the relative ratios are within the $\pm 15\%$ interval in Colombia and Venezuela; while my estimates give higher relative ratios in Brazil, Chile and Mexico. A similar comparison between “carpenters” and

¹² These ratios use a combination of urban servants and rural day workers for unskilled wages, construction workers such as masons and carpenters for semi-skilled occupations, and clerical positions in the government for skilled workers. Estimations kindly provided by Leticia Arroyo.

¹³ Note that the carpenter to unskilled farm labourer in this source shows relatively high volatility in some countries over a relatively short period of time (e.g., a decade). For instance, the corresponding ratios in 1885 are: 1.9 in Argentina, 2.8 in Brazil, 3.5 in Chile, 3.0 in Colombia, 6.1 in Mexico, 2 in Venezuela.

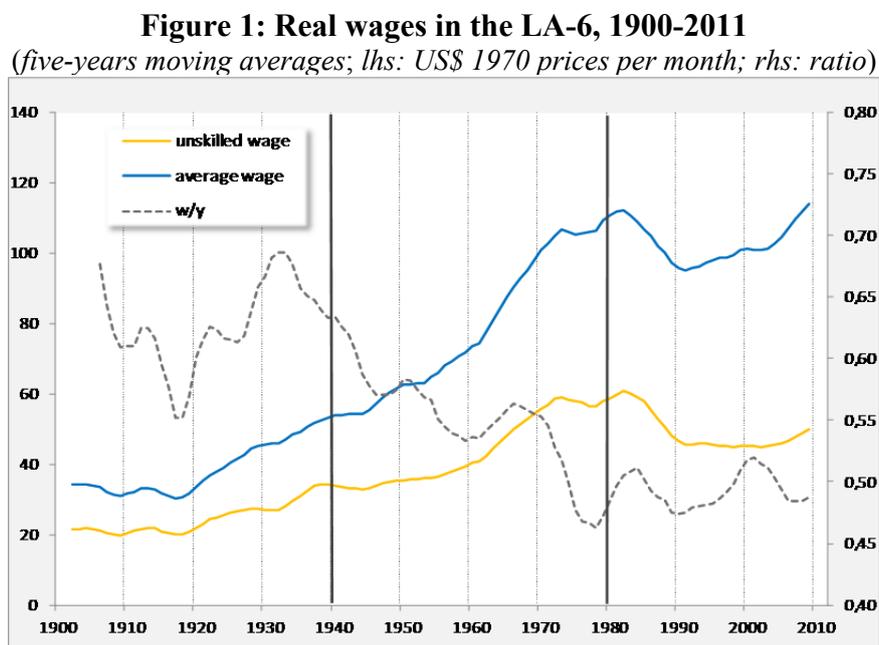
¹⁴ Both my ratios circa 1914 for Argentina ($w_2/w_4 = 2.2$ and $w_3/w_4 = 1.6$, not shown in the table) are roughly consistent with those calculated with detailed data from the 1914 census for similar occupational categories (2.1 and 1.5). Estimations kindly provided by Florencia Aráoz

my semi-skilled wages shows values within the $\pm 15\%$ interval in Brazil, Colombia and Venezuela; while my estimates give higher relative ratios in Chile and Mexico. The rankings show that relative positions in the LA-6 were relatively stable across unskilled wages, semi-skilled wages and the two income per head measures (Argentina 1; Brazil 5 or 6; Chile 2 or 3; Colombia 5 or 6; Mexico 4 or 5; Venezuela 3 or 4 (and an exceptional second position in the USDL data)).

Table 3 also includes comparisons between highly skilled workers (engineers) around 1885 (the year with more data for the LA-6) from the USDL and my skilled wages around 1900. Despite differences in the comparing year and the skill level, this additional data can be used to check consistency in ratios and the country hierarchy. There are relatively similar ratios near to 1 for Chile, Mexico and Venezuela in both sources, indicating that relatively skilled workers in those countries earned wages closer to their Argentine peers. Closer skilled wages across countries suggests that relative skills scarcity was a common feature at the start of the last century. Note that the rankings implied by skilled wages has significant differences with those of semi and unskilled wages (where Argentina dominates the top position). All in all, these comparisons show that there is broad consistency between my series (and the calculated ratios) and alternative estimates, which supports the plausibility of the estimations.

3. The growth record

Figure 1 shows the evolution of the average LA-6 for the unskilled and the average wage. Table 4 (below) summarises annual growth in wages in the three development epochs and in the overall period; whereas Table A1 in the annex includes details by decades.



The w/r ratio is the result of dividing the average wage by the income per worker. The 1910-1920 averages exclude Mexico. Sources: income per worker from Astorga (2015); otherwise see the Appendix.

The evolution of the average real wage in these six Latin American countries over more than 100 years is a story of considerable growth albeit with periods of reversals as in the infamous lost

decade of the 1980s. After two first decades characterised by relatively subdued wages, the 1920s witnessed the start of a process of sustained gains in the region. From 1920 up to 1960 the average wage rose steadily (an annual average rate of 2.0%), and then accelerated to 1980 (2.2%). Unskilled wages followed a similar pattern but with lower growth rates, 1.5% to 1960 and then 1.6% to 1980. The 1980s brought about average yearly falls of 1.1% and 0.8% in the average and the unskilled wage respectively; and the 1990s saw a modest recovery in the average wage (up 0.2%) but a continuation of the decline in unskilled wages (-0.5%). The 2000s featured an acceleration in both the average (1.0%) and the unskilled wage (0.8%) driven by a commodity boom and increases in the minimum wage in most countries (Moreno-Brid et al., 2016). The turning points in around 1920, 1960, 1980, 1990, and 2000 mark the beginning of decades with a largely shared wage performance in the six countries: strong growth in the 1920s, 1960s, and 2000s – except in Venezuela; and falls in the 1980s. By 2010 the LA-6 average wage returned to the peak of the early 1980s, but the unskilled wage was still at levels last seen in the mid-1960s. Comparing the outcomes in 2010 and in 1900, the average wage rose by 243%, and the unskilled wage by 147%.

This performance can be compared with wage gains in other global regions estimated by De Zwart et al. (2014) based on real wages of construction workers – using consumer baskets as deflators. The gains calculated with my average series for the 20th century (200%) are similar to those reported in De Zwart et al. for Latin America (190%). Both growth rates are also close to the world average (218%). But even when focusing on gains between 1940 and 1980 – the period with highest wage expansion in the region – the gains in the LA-6 (106%) are below those in East Asia (406%) and in Western Europe (147%).

Figure 1 also includes the ratio of the average wage (excluding highly-skilled wages) to the income per worker (including both property and labour income). The LA-6 average ratio was relatively high - and fluctuating around a constant trend - in the early period, experienced a falling trend in the middle, and settled at a lower level in the final period. Over the century, this ratio fell from about 0.68 around 1905 to 0.48 around 2010 (a drop of 29%); with most of this reduction occurring between 1940 and 1980 (a drop of 24%). My estimate of the wage share of overall income (not shown) has a similar profile to w/y ratio.¹⁵ Falling labour shares is a well-known fact in both developed and developing regions since the 1970s or so, and has been attributed primarily to globalisation, the increased role of financial activity, and labour market de-regulation (Stockhammer, 2012). But what this evidence indicates is that this falling trend started earlier in the LA-6 (particularly in Brazil, Colombia and Venezuela), and that rapid industrialisation and urbanisation in the middle period is a factor likely to be part of the explanation.¹⁶

As shown in Table 4, in all cases, growth between 1900 and 2011 in unskilled wages was lower than in the average wage; which, in turn, lagged behind advances in the income per worker (except Argentina). This result translated into worsening secular income inequality during the period (Astorga, 2017). Taking the decades as the unit of counting (a total of 65, once the 1910s in Mexico is excluded), in 62% of cases the growth in unskilled wages was lower than in the average wage, and in 68% of cases the growth in average wages was lower than in income per worker. And in the

¹⁵ A proxy for the wage share of income is calculated as $w/y(e_{234}/e_T)$, where (e_{234}/e_T) stands for the share of the EAP of groups 2, 3, and 4 on total EAP. Although my labour shares are a lower bound because they miss wages of professionals and fringe payments, the long term trend should be robust to the use of more comprehensive labour income estimates.

¹⁶ Frankema (2010) found labour share peaks in the 1950s in Argentina, the early-1960s in Brazil and the mid-1970s in Mexico coinciding with political regime changes and ensuing economic policy reforms.

middle period (a total of 24 cases) both percentages rise to 71%; a result that suggest the influence of factors such as labour surplus or skill-biased technical change in curbing growth in unskilled wages.

Table 4: Growth in real wages and income per worker in selected periods
(constant annual growth rates)

| | Argentina | | | Brazil | | | Chile | | | Colombia | | | Mexico ¹ | | | Venezuela | | |
|------------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|----------------|-------------|-------------|---------------------|-------------|-------------|----------------|-------------|-------------|
| | w ₄ | w | y | w ₄ | w | y | w ₄ | w | y |
| 1901-1939 | 0.96 | 1.15 | 1.38 | 1.47 | 1.18 | 1.66 | 0.34 | -0.63 | 1.11 | 1.55 | 1.98 | 2.19 | 1.21 | 1.66 | 1.96 | 1.30 | 1.81 | 2.38 |
| 1940-1979 | -0.66 | 0.91 | 1.29 | 1.10 | 2.18 | 3.09 | 0.26 | 1.73 | 2.34 | 1.31 | 1.34 | 1.70 | 2.00 | 2.14 | 2.92 | 2.85 | 2.53 | 3.94 |
| 1980-2010 | 0.72 | -0.05 | -0.98 | 0.92 | 1.15 | 0.20 | 2.79 | 2.20 | 2.55 | 0.24 | 0.35 | 0.92 | -2.71 | -0.63 | -0.53 | -3.45 | -2.28 | -1.71 |
| 1900-2010 | 0.30 | 0.74 | 0.70 | 1.18 | 1.54 | 1.78 | 0.98 | 1.00 | 1.95 | 1.11 | 1.30 | 1.66 | 0.35 | 1.16 | 1.60 | 0.57 | 0.96 | 1.83 |

w₄= unskilled wage; w= weighted average wage; y= income per worker. (1): 1901-1939 growth excludes the 1910s. Constant annual growth in a variable x is calculated by decades as $[\log(x_{10+i}) - \log(x_i)]/10$; $i=0,10,\dots,110$; with $x= w_4, w, y$. The overall growth rate 1900-2010 is the simple average of the rates by decades. Sources: see the Appendix.

The early period is characterised by positive and moderate growth in both unskilled and average wages.¹⁷ The exception is negative growth in the Chilean average wage, which partly reflects a fall from unusually high wage levels of semi and skilled wages at the start of the last century amid a nitrate boom (Matus, 2009). The 1920s stands out as a decade of positive growth in real wages in all six countries, amid a largely-shared commodity boom. Wage expansion was particularly strong in Argentina, Mexico and Venezuela (see Table A1).¹⁸ The middle period brought about significant real gains in the average wage in Brazil (with annual growth of 2.18%), Chile (1.7%), Mexico (2.2%) and Venezuela (2.5%). Mexico and Venezuela experienced substantial advances in unskilled wages (which grew annually by 2.0% and 2.9% respectively). The growth in unskilled labour was more moderate in Brazil (1.1%) and Colombia (1.3%), modest in Chile (0.3%), and negative in Argentina (-0.7%). In the last two countries the lacklustre performance is largely the result of a sharp decline in the 1970s.

However, during the last two decades of the 20th century, the Debt Crisis, trade liberalisation and labour market reforms erased most of the gains achieved in the middle decades. Mexico (where the unskilled wage fell by an annual rate of -4.9%, and the average wage rose by 1.7%) and Venezuela (-3.3% and -2.5) are clear examples of this setback. Chile stands out with positive annual growth of 3.3% and 2.2% in the unskilled and the average wage respectively. The first decade of the 21st century is dominated by rising real wages supported by improved terms of trade - as in the 1920s - and rises in the minimum wage (particularly in Argentina and Brazil). The unskilled and the average wage rose strongly in Argentina (with annual rates of 1.2% and 1.8% respectively), Brazil (4.5% and 1.5%), Chile (1.7% and 2.1%), and Mexico (1.6% and 1.5%).¹⁹

¹⁷ Brazil has the higher annual growth rate in unskilled wages (1.47%); a figure that may be an overestimation because of the use of wage data for Rio de Janeiro in the 1900s (Lobo, 1978) as representative of the country as a whole.

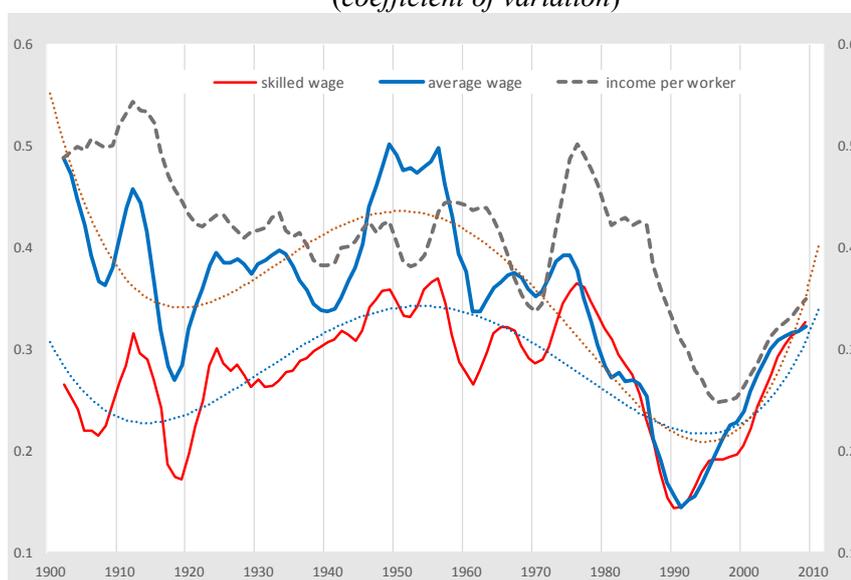
¹⁸ The average growth rate between 1900 and 1935 of my regional average (47% - the unskilled wage has a similar rate) is well above the 29% growth figure in Williamson (1999) – including Argentina, Brazil (Southeast region), Colombia, Cuba, Mexico and Uruguay. Therefore, my LA-6 has a better comparative wage performance vis-à-vis Great Britain than Williamson's LA-6 in this period.

¹⁹ My estimation of the unskilled wage in Mexico in the 2000s relies on labour income for workers with primary education or less reported in household surveys (Campos et al., 2015). The use of minimum real wages compiled by ECLAC from official sources gives a 4.4% fall during the 2000s and a 70% fall between 1980 and 2010. The decline between 1980 and 2010 in my unskilled wage is 58%.

3.1. Wage convergence across countries

Figure 2 presents information on wage dispersion (a measure of sigma convergence) in the LA-6 for the skilled wage and average wage with added polynomial lines to capture secular trends. It also includes the same measure for income per worker. Skilled wages were relatively more tightly distributed over time (a lower level in the coefficient of variation). It shows a moderate secular rising trend up to the 1950s, and then a decline with a trough around 1990 and a strong rising trend thereafter. By 2010 the level of dispersion returned to its long-term average (coefficient of variation of 0.30). Secular convergence in skilled wages in the early decades of the 20th century was relatively high, despite significant differences in the level of development within the LA-6 at the time,²⁰ suggesting that relative scarcity of skilled workers tended to be a common feature in this sample of countries.

Figure 2: Wage convergence in the LA-6, 1900-2011
(coefficient of variation)



Sources: income per worker from Astorga (2015); otherwise the Appendix.

By contrast, the dispersion profile of average wages shows a secular falling trend up to the late 1930s, and then a pattern similar to the one shown by skilled wages (though with a more pronounced peak in the 1950s). The coefficient of variation in 2010 returned to values registered in the early 1960s, but still below the long-term average of 0.35. The peak in LA-6 dispersion in the 1950s is driven by lagging wage levels in Brazil, Chile and Colombia. The dispersion profile of unskilled wages (not shown) resembles that of average wages, but with a more pronounced jump in the mid-1970s driven by high wages in Venezuela and Mexico, whereas the profile of the semi-skilled resembles that of the skilled wages.

High convergence around 1990 appears to be an anomaly associated with the Debt Crisis, in a story of otherwise limited convergence. This is in spite of increasing structural similarities in the LA-6, especially since the 1970s. In particular, closer trade integration (both at a regional and international level) was supposed to drive convergence but the strong rising trend post 1990 is not supporting this expectation and may indicate that local labour market conditions and institutional

²⁰ US Department of Labor data confirms this feature as early as 1885. See Table 3.

differences may have prevented regional wage convergence. This is a result that needs further investigation. Another feature to highlight is that dispersion in income per worker exhibits trends resembling those in average wages (and unskilled wages), but it shows consistently higher values over the whole period with the exception of the 1950s. The same is true for dispersion in GDP per capita (not shown). This indicates that regional dispersion in property income (and highly skilled wages) was higher than in wages over the period.

LA-6 dispersion discussed so far hides significant changes in the country hierarchy. Figure A1 in the annex includes charts showing the wage positions relative to Argentina's levels. Around 1900 Argentina had the highest level of unskilled wages and average wages (except for Chile), but that lead was narrowed by 1940 and lost by 1980. Mexico and Venezuela led in the 1970s – supported by the oil windfalls – and Chile became the regional leader in wages post 1990. The country hierarchy in income per worker shows a similar result as in unskilled wages but with a more pronounced lead from Venezuela in the period 1940-2000. Also, similar values of LA-6 dispersion can be associated with rather different country rankings. For instance, the hierarchy of unskilled wages in 1960 shows Argentina at the top, then Venezuela, Mexico, Chile, Brazil and Colombia; but in 2010 Chile was at the top followed by Brazil, Argentina, Colombia, Mexico and Venezuela. A similar comparison for the average wage shows in 1960 Venezuela at the top and then Argentina, Mexico, Chile, Brazil and Colombia; whereas in 2010 Chile was at the top followed by Brazil, Argentina, Mexico, Colombia and Venezuela. These changes in relative positions point to a weak persistence in wage advances within the region.

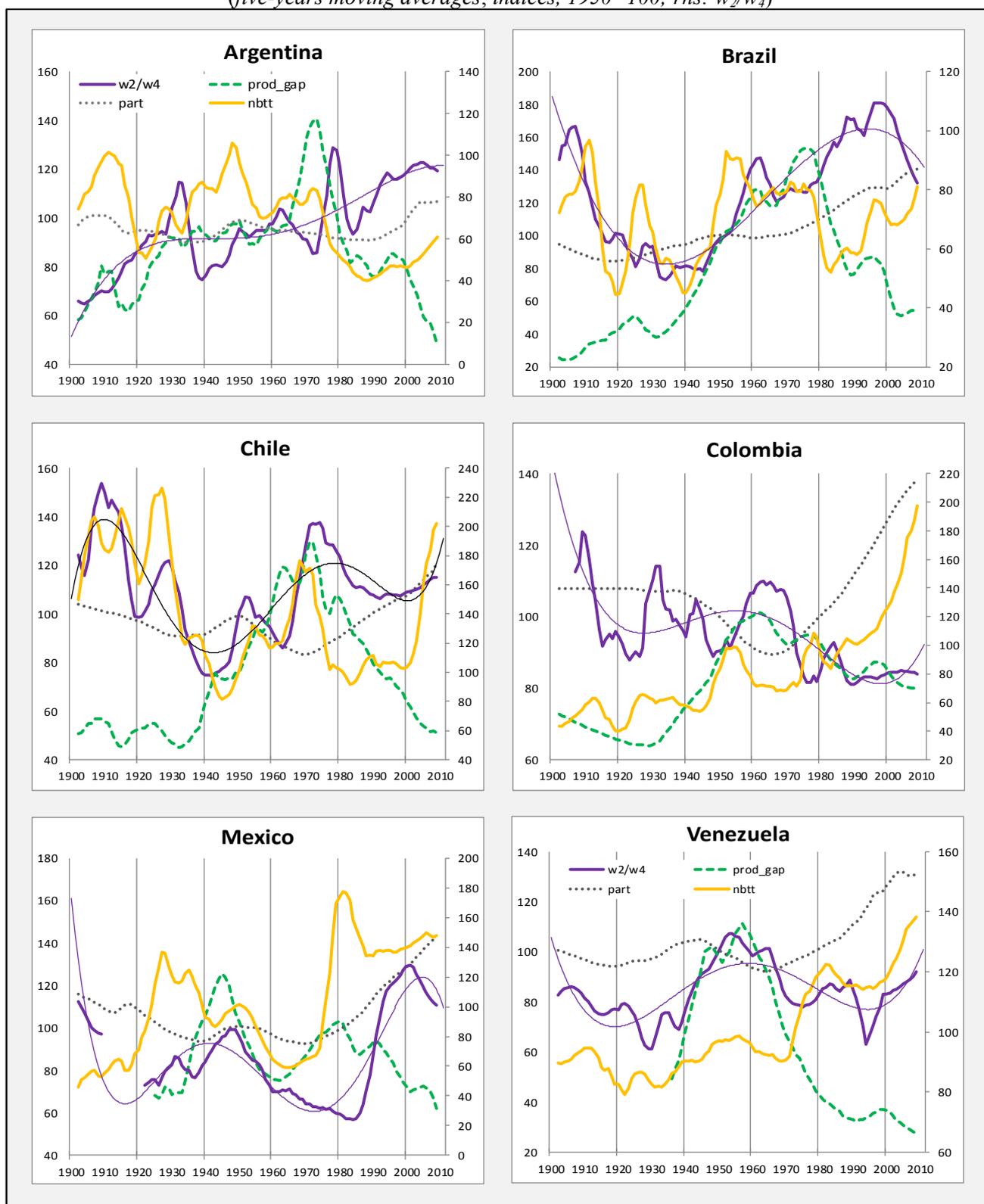
4. Wage skill premiums within countries

Figure 3 presents country charts with wage skill premiums (w_2/w_4 ratios) together with polynomial lines to capture secular trends. Table A2 includes estimates by country every five years. There is significant diversity in secular trends and fluctuations. Argentina shows a rising long-term trend and Colombia a falling one. The other four economies experienced significant changes in trends (m-shaped in Brazil and Chile) with premiums in 2000 similar to those estimated in 1900. Changing trend trajectories and fluctuations in premiums are likely to be associated with differences in these economies in terms of factor endowments, integration in the world economy, structural change and institutional transformations. Although a comprehensive and rigorous assessment of the relative contribution of these fundamentals is beyond the limits of this work, in this section I use graphical analysis to explore the possible contribution of four potential drivers to variations in wage differentials. First, a crude participation rate (the ratio of EAP to population, or *part* in Figure 3) to capture the demographic transition;²¹ secondly, the ratio of value-added per worker in manufacturing relative to agriculture (or sectoral productivity gap, *prod-gap*) to account for structural change (see also urbanisation rates in Table 1); thirdly, the net barter terms of trade (*nbtt*) to reflect developments in the external context;²² fourthly, consumer-price inflation. This is complemented with references to changes in labour-market institutions and advances in education (supply of skills).

²¹ Note that *part* or EAP/POP is equal to [WAP/POP]*[EAP/WAP]; that is, the ratio of the working-age population (WAP) to total population (POP) times the activity rate (properly calculated). Because the former ratio experienced a rising trend post 1970 or so, during this period the acceleration in *part* is stronger than that in the activity rate.

²² An alternative is to use real export prices calculated as the unit value of exports deflated by the US producer price index. However, this measure is highly correlated with terms of trade (a paired correlation of 0.81 for the LA-6 in 1900-2000), and its use would lead to similar conclusions.

Figure 3: Skill premiums and key drivers in the LA-6, 1900-2011
(five-years moving averages; indices, 1950=100; rhs: w_2/w_4)



Notes: *nbtt* in Venezuela is in logs to facilitate the plotting of the series. Sources: terms of trade for Brazil from IBGE website, Chile from Díaz et al. (2005). For skill premiums see the Appendix. Otherwise MOXLAD.

My crude participation rates can only inform about secular trends as the construction of the series relies on interpolation between census data; whereas *prod-gap* (where interpolation is used in calculating the sectors' EAPs) can inform about secular trends and critical points (peaks, troughs and inflection points). The terms of trade can potentially inform about both trends and shorter-term fluctuations in skill premiums as both series are calculated with annual data. And the inflation record – particularly hyperinflation episodes - can account for peaks in premiums. In the case of the last two drivers, the graphical analysis is complemented with paired correlations with wage premiums.

The impact of changes in the terms of trade on wage skill premiums is complex and the net result ambiguous. The immediate effect will be felt in the export sector. Other things being equal, if the demand of the main exports is biased towards relatively skilled labour, significant and sustained gains in the terms of trade should favour a widening in wage premiums and vice versa. Another aspect to consider is the relative skill intensity in the production of the tradable and non-tradable goods (Galiani et al., 2010). If, on average, non-tradable activities demand fewer skills than those in the tradable sector, the skill premium will fall in the wake of a positive terms-of-trade shock (via a spending effect, as in the Dutch disease model). But, if non-tradable activities are relatively skills intensive, premiums are expected to widen.²³ Table 5 summarises pair correlations by country in selected periods. Both series are three-years centred moving averages to track better potential associations in short term trends.

Table 5: Skill wage premiums and the terms of trade
(paired correlations between three-year moving average series)

| | Argentina | Brazil | Chile | Colombia | Mexico¹ | Venezuela² |
|------------------|------------------|---------------|--------------|-----------------|---------------------------|------------------------------|
| 1900-2010 | -0.68 | 0.24 | 0.53 | -0.58 | 0.29 | 0.52 |
| 1900-1939 | -0.62 | 0.50 | 0.58 | 0.03 | 0.11 | 0.41 |
| 1920-1929 | 0.47 | -0.63 | 0.82 | 0.21 | 0.27 | -0.49 |
| 1940-1979 | -0.67 | 0.58 | 0.58 | -0.51 | 0.19 | 0.60 |
| 1980-2010 | 0.54 | 0.07 | 0.35 | -0.25 | -0.56 | 0.54 |
| 1980-1999 | 0.25 | 0.78 | -0.47 | -0.74 | -0.60 | 0.51 |
| 2000-2011 | -0.36 | -0.85 | 0.96 | -0.27 | -0.71 | 0.92 |

(1) Averages in 1900-2010 and 1900-1939 start in 1920. (2) To deal with a discontinuity in the terms of trade in 1973, the 1940-79 figure is the average of 1940-72 and 1973-80; and 1900-2010 is the average of the three periods. Sources: terms of trade for Brazil from IBGE website, Chile from Díaz et al. (2005). Otherwise MOXLAD database. Skill premiums see the Appendix.

Judging by the high correlations between both variables over the whole period as well as the sub-periods, the terms of trade appear as a key variable in explaining both trends and fluctuations in wage premiums.²⁴ However, there are important differences across countries and development periods in the direction of this link: opposite moves dominate in Argentina and Colombia; whereas simultaneity dominates in Chile, Venezuela and, to a lesser extent, in Brazil and Mexico. Although

²³Bear in mind that because my wage series do not discriminate between export and non-export sectors or between tradable and non-tradable ones, they lack the necessary detail to inform about the different mechanisms at work. Therefore, any associations between terms of trade and premiums should be interpreted with caution. In general, my unskilled wages tend to be dominated by wages in agriculture (particularly prior to 1960 or so); whereas my skilled wages refer largely to manufacturing (usually a tradable sector, but in this case heavily sheltered from foreign competition during the middle period).

²⁴ Causality can run both ways. For instance, a change in export prices can impact on wage levels; or subdued wages (under surplus labour) can translate into low commodity prices as assumed in the Prebisch-Singer hypothesis.

explaining such link diversity is beyond the scope of this study, one potential candidate is the nature of the dominant commodities. For instance, the export sector in Colombia during most of the time was dominated by coffee production in small holdings – and wide spread geographically – and with a relatively intensive use of unskilled labour (Thorp, 1991: chapter 3). The negative and high correlation between 1900 and 2010 suggest that terms of trade gains benefited the unskilled more than proportionally, resulting in opposite moves with wage premiums. By contrast, when minerals and oil were the dominant commodities (Chile, Mexico, and Venezuela), an export sector relatively intensive in the use of capital and skilled labour may have created the conditions for synchronised trends. The remainder of this section discusses the association between wage premiums and key drivers in each of the three epochs.

4.1. Early period (1900-1939)

With the exception of Argentina, the early period is dominated by a secular reduction in wage premiums, particularly clear in the first two decades. In Argentina, the productivity gap and the premiums show rising trends from 1900 up to the early 1930s. This synchronised move is also consistent with rapid urbanisation in the period. Also, sizeable labour immigration may have prevented unskilled labour from receiving the benefits of the opportunities created by the expansion in foreign demand (Arroyo and Astorga, 2016). Narrowing premiums are difficult to reconcile with the behaviour of the drivers at hand. The association with productivity differentials shows mixed patterns in those countries where *prod-gap* can be calculated: opposite trends in Brazil, and synchronised trends in Chile (falling trends) and Colombia (constant). But, with the exception of Chile, these early decades were not characterised by significant strides in industrialisation (particularly when compared with developments in the middle period) and, thus, are not expected to show a close association between both variables.

Participation rates are roughly constant in Argentina, Brazil, Colombia and Venezuela, and equally are unlikely to have been an important factor behind changes in premiums in these countries in the early decades.²⁵ In Chile and Mexico, falling trends in participation are accompanied by falling premiums, suggesting that other factors were more influential. Meanwhile, there were significant advances in average years of education in Chile (also in Argentina), but schooling improvements were limited in the other four countries (see Table 1). And whilst a downward trend in the terms of trade could have played a role in reducing premiums in Brazil, Chile and Venezuela; the dominant forces may be found in changes in labour-market institutions (e.g., less labour coercion and more integrated labour markets).

A shared commodity cycle (a boom in the 1920s and a bust in the first half of the 1930s) offers a good opportunity to examine the degree of country commonality in the response of skill premiums to changes in the terms of trade – and, more generally, to developments in the export sector. First, widening premiums dominated in the export boom of the the1920s (rising *nbtt*); then, narrowing premiums during the first half of the 1930s (Venezuela is the exception, but in this case I cannot rule out that it is partly caused by poor quality data). Over the whole early period, there is a contrast between a negative correlation in Argentina (-0.62) and its absence in Colombia, on the one hand,

²⁵ However, data limitations undermine the use of this variable in this period. In Argentina there is a gap in census data between 1914 and 1947; and Colombia lacks reliable EAP data before the 1938 census.

and relatively strong and positive correlations in Brazil, Chile and Venezuela (0.50, 0.58, 0.41 respectively) on the other.

4.2. Middle period (1940-1979)

The graphical inspection of the middle period shows trends and peaks in premiums broadly in line with the timing of the structural change (as reflected in the productivity gaps and the urbanisation rate) in Brazil (peak in early 1960s), Chile (peak in the 1970s), Colombia (peak in the 1960s), Mexico (peak in the mid-1940s) and Venezuela (peak in the 1950s). Also, Brazil, Chile, and Venezuela offer good examples of synchronised trends in both variables. This gives some support to the influence of a Kuznets-Lewis process of an acceleration in urbanisation and industrialisation amid relative skills scarcity creating conditions for a rise in skill premiums.²⁶

These are years of high population growth and falling trends in participation rates up to around 1970 when there is a change in direction as a result of the slowdown in population growth in the 1950s and 1960s. A combination of a fast-growing labour force and a relatively slow rate of job creation in the urban formal sector - particularly post 1970 - resulted in a rapid increase in urban informality (largely in the service sector) with relatively low productivity and wages (Bulmer-Thomas, 2013). According to PREALC (1982) the share of the informal urban population on the EAP in the LA-6 rose from 10% in 1950 to 15% in 1980. Although there were more widely spread educational advances in the LA-6 during this period (especially in Mexico and Venezuela), this effort in itself, was not enough to curb increases in skill premiums.

In contrast with the country commonality shown in the 1920s and, to a lesser extent, in the 1930s, the middle decades exhibit a more diverse picture in the association between premiums and terms of trade. Opposite trends continued to prevailed in Argentina (a correlation of -0.67) and Colombia (-0.51); synchronised rising trends (except in the early 1960s) in Brazil and Chile (correlations of 0.58 in the period). In Mexico and Venezuela both variables move in tune upward with correlations of 0.19 and 0.60 respectively.²⁷ The relatively high correlations in this period suggest that despite the dominance of protectionist policies, external conditions and the export sector continued to play an important role in wage setting. Meanwhile, bouts of very high inflation or hyperinflation are associated with hikes in premiums in Argentina (early 1960s, and late 1970s), Brazil (early 1960s), and Chile (early 1950s and early 1970s). The paired correlations between premiums and inflation for these three countries in the middle period are 0.6 in Argentina and Chile and 0.65 in Brazil; whereas similar correlations are weak in the remaining three countries.

These are also decades of changes in labour institutions with mixed distributive results. The actions of governments and unions supporting wage austerity subdued upward trends in most countries during the 1940s – especially during the war years (Roxborough, 1984), whilst minimum wages and pro-labour policies (particularly in Argentina, Chile, and Mexico) during the 1950s and 1960s favoured rising trends in unskilled wages and wage compression. For instance, the narrowing trend in skill premiums in Mexico from around 1950 has been attributed to favourable minimum wage policies and high rates of unionisation (Márquez Padilla, 1981). However, towards the end of the middle period the military regimes in Argentina (1976-83), Chile (1973-90), and Brazil (1963-

²⁶ Intra-industry wage inequality also rose in Argentina (from early 1960s), Brazil and Chile (Frankema, 2012) suggesting skills-biased technological change.

²⁷ In Mexico the correlation up to 1973 – before the 1974 hike in oil prices – is 0.90; and negative in the remaining of the 1970s.

80) effectively restricted – or banned - the action of unions, increased flexibility in the labour market, and reduced the coverage of the minimum wage as part of the reform agenda (Morley, 2000).

4.3. Final period (1980-2011)

The closing two decades of the 20th century witnessed the implementation of structural reforms and the shift from relatively closed, state-dominated economies, to ones more open and market oriented. In a context of relatively short supply of skills and rising labour informality, trade liberalisation encouraged the expansion of skill-intensive export activities and, as a result, skill premiums widened (Stallings and Peres, 2000).²⁸ My evidence shows widening skill premiums in Argentina, Brazil, and Mexico (after the 1982 Debt Crisis) and Venezuela. Also, hyperinflation episodes in Argentina (1970s and 1980s), Brazil (1980s and early 1990s) are consistent with hikes in wage differentials.

The final period is dominated by falling trends in the productivity gap and rising trends in skill premiums. But these are decades with highly urbanised societies, where the dynamics associated with internal migration are unlikely to have played a significant role in determining premiums. Indeed, after 1980 or so the dominant force for structural change was the shedding of labour from higher productivity manufacturing to lower productivity services (with a significant presence of labour informality), resulting in de-industrialisation and a move towards higher wage inequality. And the delayed impact on the labour force of high population growth rates in the 1950s and 1960s, together with increasing participations rates – particularly female rates – undermined further unskilled wages.²⁹ Rising skill premiums were also supported by educational efforts lagging behind the increase in the demand for highly skilled labour (Duryea and Székely, 2000).

Institutional changes also played their part in explaining widening premiums. Unionisation continued its decline across the region, averaging only 10.7% of the workforce by 2005 compared to a peak of 23% in the 1970s (Roberts, 2012) and minimum wages experiences a significant setback. ECLAC (2015) shows a 5.9% decline in the average real minimum wage for the LA-6 during the 1980s, followed by a moderate recovery of 1.7% annual increase in the 1990s. The effect of these underlying trends in the labour market were compounded by a wave of deregulation and privatisations that shifted formal employment to an already large informal sector (PREALC, 1990).

The inauguration of the 21st century brought about a Chinese-driven commodity boom, which made possible improvements in employment and real wages – in particular for the unskilled, amid a fall in wage premiums. Governments across the region – largely of left-wing orientation – implemented more progressive social spending. They also engaged in a more active role in the labour market, raising the minimum wage or taking a more pro-union stance (Gasparini and Lustig, 2011). My skill premiums fall significantly in Brazil and Mexico, and show more moderate declines in Argentina and Colombia in the second half of the decade; whilst they rise in Chile and Venezuela. The contrast between the dominance of widening premiums in the 1990s and narrowing ones in the 2000s is consistent with findings in Gasparini et al. (2011) of a strong increase in the relative demand

²⁸ In a panel data study Székely and Sámano (2012) found that greater trade openness was associated with widening income inequality (largely reflecting wage inequality) in the region during the period 1980-2000. They also found that, once fully implemented, trade liberalisation did not lead to further inequality rises in the first decade of this century.

²⁹ According to my calculations based on official figures, the population in the LA-6 (simple averages) grew 74% between 1950 and 1970, and 56% between 1970 and 1990. The corresponding growth rates for the EAP are 64% and 85%. The same calculations for the 1930-1950 period shows a more even process with population and EAP growth both at 57%. As to female participation rates, there were few changes in 1940-1970, and an explosive growth in participation from 1970 to 2000 (Camou and Maubrigades, 2017).

for skilled labour in the 1990s in all countries; but a reversal in trends in the 2000s (except in Colombia).

Terms of trade in the 1980s and 1990s were dominated by adverse movements particularly in Argentina, Brazil, Mexico and Venezuela. In these countries, with the exception of Mexico, the correlation between premiums and terms of trade is positive (Argentina 0.25, Brazil 0.78, Venezuela 0.51), suggesting that negative external shocks affected skilled wages more than proportionally. Chile and Colombia experienced limited variations in their terms of trade and show negative correlations with their wage premiums (of -0.47 and -0.74 respectively). The 2000s was a decade of shared rising terms of trade with equally mixed associations with premiums: strong and negative correlation in Argentina (-0.36), Brazil (-0.85), Colombia (-0.27) and Mexico (-0.71) indicating that in these countries the commodity boom favoured especially the unskilled; but strong and positive in Chile (0.96) and Venezuela (0.92).³⁰ Hyperinflation in Brazil during the 1980s coincides with years of steady rise in the country's wage premium. Also, very high inflation in Venezuela between 1993 and 1996 may have contributed to a sudden drop in the skill premium in those years (but here the association is negative).

5. Conclusions

This paper offers a long-run view of Latin American wage developments based on three yearly wage series defined according to occupational categories. When assembling these series, special attention was paid to maintaining consistency over time and comparability across countries. Comparisons made with alternative wage and income per capita data around 1900 and 2000 show broad consistency and support the plausibility of the estimations. A virtue of this work is a wide country coverage over a long horizon which makes it possible to identify secular trends and turning points as well as to unveil regional patterns; but a drawback is that it cannot offer a detailed account on wage developments in a specific country or period. Therefore, my findings need to be complemented – and confirmed – by more in-depth studies at a country level.

There were significant advances in real wages especially during the 1920s, the middle decades of the 20th century, and the 2000s. For the LA-6 average, the real average wage increased 243% between 1900 and 2010 (and 232% up to 1980). For the unskilled, the rise for the whole period was 147% (183% up to 1980). In general, the middle period includes the higher growth rates for the average wages, but mixed results for the unskilled wage (only in Colombia, Mexico and Venezuela are the advances in this period better than in the first period). The 1980-2010 period registered the worst wage outcome (Chile is the exception), despite the growth acceleration in the 2000s. When this long-term performance is placed into a broader geographical context, Latin American wage gains over the long run are close to the global average, and significantly below other developing regions such as East Asia.

Real growth between 1900 and 2011 in unskilled wages was lower than in the average wage; which, in turn, lagged behind advances in the income per worker. This result is at the root of worsening secular income inequality in the region. Meanwhile, the ratio of the average wage to the income per worker for the LA-6 was relatively high in the early period, experienced a falling trend in

³⁰ This is consistent with findings in Gasparini et al. (2011) of a negative and significant correlation - after controlling for changes in official minimum wages - between wage premiums and the terms of trade in the 2000s (also, as in my case, with the exception of Chile and Venezuela).

the middle, and settled at a lower level in the final period. My proxy for the labour share of aggregate income has a similar profile. Although falling labour shares is a well-known fact in both developed and developing regions since the 1970s or so, my evidence indicates that this decline started earlier in Latin America, likely to be associated with the combined effects of the dynamics of structural change, the demographic transition, and political changes.

Despite increasing structural similarities in economic, educational and demographic conditions over the period – particularly post 1970 – there is limited wage convergence in the LA-6. An episode of high convergence around 1990 appears to be an anomaly associated with the Debt Crisis. Closer trade integration (both at a regional and international level) was supposed to drive convergence, but the strong rising trend post 1990 is not supporting this expectation and could indicate that local labour market conditions and institutional differences may have prevented regional wage convergence. This is a result that needs further investigation.

A number of fundamental forces influenced developments in wage skill premiums, with the timing, intensity, and direction of the link – acting in a reinforcing or an opposing fashion - varying across the six countries. Structural change dynamics acted earlier in Argentina and later in the other five countries (usually in the middle decades) displaying – as expected – synchronised trends in sectoral productivity gaps and premiums. Rising trends in participation rates after 1970 amid increased labour informality are also in line with rising premiums. The post 1960 years witnessed major advances in average years of schooling and in skill formation. But these are also times dominated by widening premiums, indicating that efforts in expanding education were not enough to produce a fall in wage differentials.

The terms of trade appear as a key variable in accounting for both trends and fluctuations in premiums. It is indeed the only driver that consistently shows explanatory power over time and across the six countries. However, there are important differences across countries and periods in the direction of this link: opposite moves dominate in Argentina and Colombia; simultaneity dominates in Chile, Venezuela and, to a lesser extent, in Brazil and Mexico. Therefore, the nature of the dominant commodities seems to matter (e.g., agriculture-based vs. mining-based) more than the level of development; and it is likely to be at the root of diversity in the trajectories in premiums. Moreover, these contrasting outcomes are at odds with the idea of a uniform association between the terms of trade of commodity exporters and their wage performance as implied by the variant of Prebisch-Singer hypothesis that focuses on the labour market (Ocampo and Parra, 2010).³¹ More research is needed (based on a more detailed wage data) on the particular mechanisms behind the empirical diversity in the associations between terms of trade and skill premiums.

This study includes three measures that can inform about advances in well-being: GDP per capita, income per worker, and the real average wage. Although the first two measures are the most commonly used in long-term studies, there are good reasons to focus instead on real wages for comparative growth performance as they reflect better the standard of living of ordinary workers (Williamson, 1999). The LA-6 GDP per capita rose by 537% from 1900 to 2010 versus a 440% increase in income per worker (a 22% gap). Changes in the crude participation rate is by far the most

³¹ This variant of the hypothesis states that labour surpluses in commodity exporters - developing countries - would lead to a decline in their wages relative to those in developed countries and, hence, to a decline in the terms of trade of the commodity exporters. This would imply a similar direction of the association over the long term between terms of trade and wages in commodity exporters.

important factor contributing to this discrepancy.³² According to my calculations, around 1900, on average, one in three persons in the LA-6 was economically active; by 2010 the proportion rose to just under one in two. Meanwhile, growth in income per worker rose 440% compared to a 243% increase in the average wage (a 60% gap).³³ The latter discrepancy is explained by the combined effect of a 226% average rise in the mean income in group 1 and changes in the group composition of the labour force. Whilst in around 1900 those in group 1 represented, on average, 5% of the EAP in the LA-6; in 2010 they accounted for 15% of the EAP. Therefore, the top group – with a substantially higher mean income – saw a significant expansion over the period, which resulted in higher growth in overall income per worker than in the average wage. These significant differences between the growth performance of the three measures (and, indeed, between earnings by occupational groups) means that any conclusions on advances in living standards – as well as on the extent of the region’s catching up with rich economies - will partly depend on the measure chosen.

³² Other factors at play are the use of different deflators (the implicit GDP deflator and the CPI), and the contrast between a domestic (output) versus a national (income) concept.

³³ Although the absence of fringe payments may result in an underestimation of the increase in the average wage (assuming that they were higher post 1950 or so), it would only have a limited effect in reducing the growth disparity.

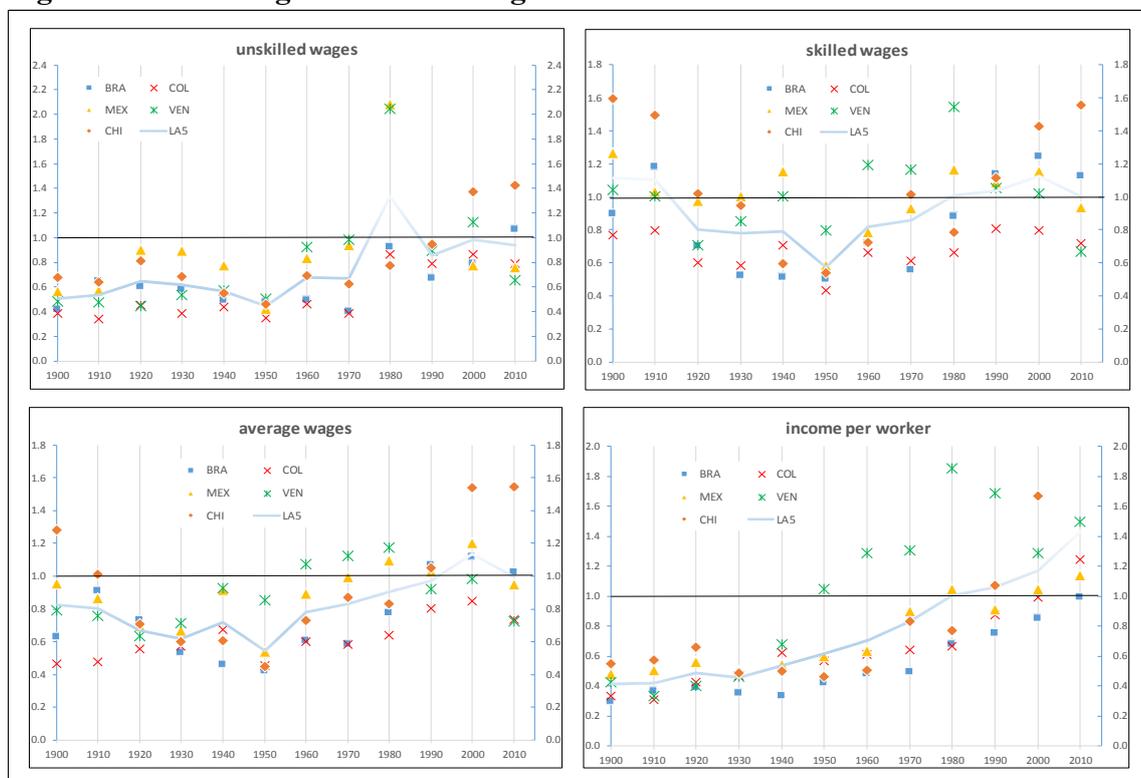
Annex

Table A1: Growth in real wages and income per worker by decades

| | Argentina | | | Brazil | | | Chile | | | Colombia | | | Mexico | | | Venezuela | | |
|-------------------------------------|-----------|-------|------|--------|-----|------|-------|------|------|----------|-------|------|--------|------|------|-----------|------|------|
| | w_4 | w | y | w_4 | w | y | w_4 | w | y | w_4 | w | y | w_4 | w | y | w_4 | w | y |
| <i>constant annual growth rates</i> | | | | | | | | | | | | | | | | | | |
| 1900s | -0.96 | -1.01 | 2.1 | 2.4 | 2.8 | 3.5 | -2.2 | -3.9 | 2.5 | -0.88 | -0.44 | -1.1 | -0.05 | -0.7 | 2.4 | -0.9 | -0.7 | -0.4 |
| 1910s | -1.7 | -0.7 | -0.3 | 0.5 | 0.0 | 0.8 | 1.2 | -1.5 | 1.3 | 2.2 | 2.9 | 3.8 | n.a. | n.a. | n.a. | -1.1 | -0.3 | 1.8 |
| 1920s | 4.4 | 5.5 | 2.7 | 0.8 | 1.6 | 2.6 | 1.5 | 2.3 | 1.0 | 1.2 | 2.8 | 3.8 | 2.3 | 3.3 | 2.1 | 3.2 | 5.2 | 3.5 |
| 1930s | 2.1 | 0.9 | 1.1 | 2.2 | 0.4 | -0.2 | 0.7 | 0.6 | -0.3 | 3.7 | 2.7 | 2.3 | 1.4 | 2.4 | 1.3 | 4.0 | 3.0 | 4.7 |
| 1940s | 2.3 | 3.6 | 1.3 | 0.7 | 1.4 | 3.0 | 0.7 | 1.0 | 0.5 | -0.2 | -0.2 | 1.1 | -4.2 | -2.6 | 2.6 | 1.1 | 3.5 | 6.2 |
| 1950s | -1.0 | -0.7 | 1.3 | -0.7 | 1.5 | 2.8 | 0.8 | 1.7 | 2.5 | 0.6 | 1.1 | 1.7 | 4.0 | 4.1 | 1.5 | 3.6 | 1.8 | 3.1 |
| 1960s | 1.5 | 1.12 | 1.07 | 1.4 | 2.1 | 2.0 | 3.0 | 4.7 | 5.6 | 1.8 | 2.2 | 2.4 | 5.5 | 4.9 | 5.2 | 4.4 | 3.6 | 1.7 |
| 1970s | -5.5 | -0.4 | 1.5 | 3.0 | 3.8 | 4.5 | -3.4 | -0.5 | 0.8 | 3.1 | 2.2 | 1.6 | 2.7 | 2.0 | 2.4 | 2.3 | 1.1 | 4.8 |
| 1980s | 3.0 | -0.5 | -1.1 | -2.4 | 1.9 | -0.8 | 3.6 | 1.0 | 1.1 | 0.61 | 0.64 | 0.74 | -5.8 | -4.0 | -3.3 | -5.5 | -3.9 | -2.8 |
| 1990s | -2.0 | -1.4 | -1.7 | 0.7 | 0.1 | 0.1 | 3.1 | 3.5 | 3.6 | -0.12 | -0.15 | 0.1 | -3.9 | 0.6 | 0.7 | -0.6 | -1.1 | -4.3 |
| 2000s | 1.2 | 1.8 | -0.1 | 4.5 | 1.5 | 1.3 | 1.7 | 2.1 | 2.9 | 0.2 | 0.6 | 1.9 | 1.6 | 1.5 | 1.0 | -4.2 | -1.8 | 1.9 |
| <i>Indeces (1940=100)</i> | | | | | | | | | | | | | | | | | | |
| 1900 | 68 | 63 | 59 | 58 | 65 | 53 | 83 | 119 | 65 | 52 | 44 | 38 | n.a. | n.a. | n.a. | 58 | 44 | 37 |
| 1920 | 62 | 69 | 70 | 76 | 89 | 82 | 92 | 85 | 92 | 64 | 58 | 47 | 72 | 61 | 72 | 48 | 43 | 41 |
| 1940 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1960 | 101 | 122 | 128 | 100 | 137 | 186 | 126 | 144 | 130 | 106 | 113 | 126 | 108 | 121 | 150 | 163 | 158 | 244 |
| 1980 | 87 | 154 | 168 | 160 | 248 | 343 | 121 | 215 | 259 | 168 | 169 | 180 | 229 | 231 | 323 | 305 | 252 | 460 |
| 2000 | 86 | 121 | 123 | 137 | 290 | 316 | 214 | 306 | 411 | 170 | 174 | 196 | 86 | 173 | 238 | 170 | 156 | 234 |
| 2010 | 101 | 150 | 123 | 219 | 354 | 368 | 259 | 382 | 562 | 181 | 190 | 246 | 98 | 189 | 259 | 115 | 137 | 273 |

w_4 = unskilled wage; w = weighted average wage; y = income per worker; n.a.= not available. Constant annual growth in a variable x is calculated by decades as $[\log(x_{10+i}) - \log(x_i)]/10$; $i=0,10,\dots,110$; with $x= w_4, w, y$. Sources: income per worker in Astorga (2015). Otherwise see the Appendix.

Figure A1: Real wages relative to Argentina



Sources: income per worker in Astorga (2015). Otherwise see the Appendix. LA5 = Brazil, Chile, Colombia, Mexico and Venezuela.

Table A2: Skill premiums every five years by country

| | Argentina | Brazil | Chile | Colombia | Mexico | Venezuela |
|-------------|--|---------------|--------------|-----------------|---------------|------------------|
| | <i>ratio skilled to unskilled wages (w_2/w_4)</i> | | | | | |
| 1900 | 2.02 | 4.32 | 4.75 | 4.74 | 4.50 | 3.09 |
| 1905 | 1.97 | 4.75 | 3.97 | 4.03 | 4.10 | 3.33 |
| 1910 | 2.13 | 3.92 | 4.97 | 4.74 | 3.87 | 3.16 |
| 1915 | 2.40 | 2.90 | 4.86 | 3.47 | n.a. | 2.87 |
| 1920 | 2.59 | 3.16 | 3.24 | 3.62 | 2.83 | 3.01 |
| 1925 | 2.78 | 2.47 | 3.82 | 3.41 | 2.85 | 2.85 |
| 1930 | 3.04 | 2.81 | 4.13 | 4.61 | 3.40 | 2.29 |
| 1935 | 2.91 | 2.22 | 2.98 | 3.85 | 3.01 | 2.98 |
| 1940 | 2.28 | 2.37 | 2.45 | 3.68 | 3.38 | 2.95 |
| 1945 | 2.34 | 2.34 | 2.55 | 3.77 | 3.78 | 3.49 |
| 1950 | 2.86 | 2.99 | 3.35 | 3.56 | 3.97 | 3.84 |
| 1955 | 2.81 | 3.36 | 3.34 | 3.72 | 3.44 | 4.11 |
| 1960 | 2.96 | 4.36 | 3.09 | 4.24 | 2.78 | 3.76 |
| 1965 | 2.95 | 3.81 | 2.95 | 4.27 | 2.80 | 3.92 |
| 1970 | 2.65 | 3.77 | 4.30 | 4.19 | 2.63 | 3.11 |
| 1975 | 2.92 | 3.69 | 4.37 | 3.19 | 2.46 | 3.01 |
| 1980 | 4.20 | 3.98 | 4.19 | 3.21 | 2.35 | 3.15 |
| 1985 | 2.89 | 4.67 | 3.74 | 3.50 | 2.25 | 3.26 |
| 1990 | 3.05 | 5.25 | 3.58 | 3.11 | 3.46 | 3.55 |
| 1995 | 3.46 | 5.92 | 3.65 | 3.20 | 4.85 | 2.36 |
| 2000 | 3.54 | 5.59 | 3.68 | 3.26 | 5.24 | 3.16 |
| 2005 | 3.66 | 4.46 | 3.76 | 3.29 | 4.74 | 3.33 |
| 2010 | 3.55 | 3.74 | 3.88 | 3.23 | 4.36 | 3.61 |

All values are three-years centred averages except 1900 that averages 1900 and 1901; n.a.= not available.
Sources: see the Appendix.

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Appendix

This appendix 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. 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.³⁴ 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).³⁵ 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.
- *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/OI1.³⁶ 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.

³⁴ 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.

³⁵ 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".

³⁶ 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.

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 : linear interpolation, and pattern interpolation which uses information of a known series x to fill the gap in y .³⁷ 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 (ECLAC, 1978).

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

³⁷ 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).

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 Shepley (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 (following 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 $RU\%$ around 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.

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.

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/OI1 (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: to connect the two benchmark years of 1938 and 1948 I use wage data for unskilled rural worker (*diarista*) for the state of Sao Paulo. 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 IPEAdata.

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 average I use the $RU\%$ around 1970 = 0.77 (see below) as weight.

*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 $RU\%$ around 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 (following this procedure results in a $RU\%$ in 2000 of about 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 (cruzeiros 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 IPEADATA.

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 worker. Both series in escudos of 1960 sourced from Rodríguez Weber (2014). The equal weights 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. The weight for $RU\%$ around 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: ECLAC real minimum wage.

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: PREALC index for real monthly wages in the construction sector.

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

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

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 (following this procedure results in a *RU%* in 1950 of about 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%* around 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). 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 (following this procedure results in a *RU%* in 2000 of about 0.48).

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

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). 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.

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.

*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.

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 I construct a ratio of the wage paid 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); and then apply this ratio to the average unskilled wage in PPP\$ of 1970 in the LA-5 circa 1900. Note that the wage estimation in 1900-1910 are not fully comparable with those 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 (following this procedure results in a $RU\%$ in 1950 of about 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. The weight for $RU\%$ around 1970 = 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. Between 1980 and 1982 it grows 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. To estimate the weights I adjust the $RU\%$ in 1970 in line with changes in the population in rural areas (following this procedure results in a $RU\%$ in 1995 of about 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.
 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.
 *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.
 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 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 (minimum wage by decree), 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. We used 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 we 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 (following this procedure results in a $RU\%$ in 1950 of about 0.77).

*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 $RU\%$ around 1970 = 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 78, 81, 85, and 88. Otherwise interpolated. In 1988-1990 uses minimum urban real wage index (1980=100) from ECLAC. To estimates 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 0.37).

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 (1993).

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.

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