Earnings Inequality in Latin America post 1900

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Abstract

This paper discusses and documents new consistent yearly series of earnings inequality for four occupational categories in six leading Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela) since 1900 using a newly assembled dataset of real wages. This work builds on a previous effort by FitzGerald (2008). Our approach differentiates labour by skill level (unskilled rural; semi-skilled urban; and relatively skilled urban) and allows for changing sectoral allocation of the labour force over time. Profits and rents are calculated as a residual. This information makes possible the calculation of between-groups earnings inequality that can inform about trends and turning points in the six countries. We focus on “proximate” causes of inequality (changes in prices and quantities), rather than on the role of fundamentals which will be the subject of a separate paper. Our regional inequality measure shows a changing secular process with an “M” shape with turning points around 1930, 1950 and 1980-1990 roughly consistent with changes in the trade regime and the industrialisation-migration process. We also identify a synchronised pattern in the link between the real average wage and its dispersion, particularly dominant since 1960 or so, pointing to skills scarcity.1

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1. Introduction

Despite a sustained reduction during the last decade or so Latin America is a region still known for its high levels of inequality.\(^2\) This high-inequality tag attached to the region originated in the early 1970s at the time of the first efforts to implement comprehensive and consistent household budget surveys – the basic data to calculate income Ginis - across the region. The story of a highly unequal region is supported by the dominant view of the institutionalist approach that places the origin of high income inequality in the colonial period (Engerman and Sokoloff, 2000, 2002; De Ferranti et al., 2004; Robinson & Sokoloff, 2004). However, this claim is somehow at odds with evidence on inequality during the first globalisation which indicates a rising trend from circa 1870 to 1920 in countries in the Southern Cone (Williamson, 1999, Bértola et al, 2008, 2010). This indicates that the region’s relatively high inequality is mainly a late XIXth Century phenomenon – though conditioned by inherited structural features. Moreover, Dobado and Garcia (2010) show that circa 1820 countries such as Mexico, Bolivia and Colombia were not especially unequal in an international comparison. And Milanovic et al., (2010) have argued, based on estimates of maximum possible inequality levels, that countries such as Brazil and Peru circa 1870 were not more unequal that other economies in the pre-industrial era.

However, the truth is that there is little evidence on what happened to income inequality prior to 1970, and particularly during the middle decades of the last century.\(^3\) The purpose of this paper is to discuss and document new yearly series of earnings inequality for six leading Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico and Venezuela) since 1900 using a newly assembled dataset of real wages for three occupational categories of the labour force: unskilled rural workers; semi-skilled urban workers; and relatively skilled urban workers. Having yearly time series for this group of countries allows the study of trend behaviour and turning points and makes possible econometric analysis to explain inequality in terms of its fundamentals or to use them to account for growth performance.

\(^2\) Income inequality since 1980 in Latin America has been widely studied. Some of the key contributions are Cornia (2011); López & Perry (2008); López-Calva & Lustig (2010); Szequely & Sámano (2012); Gasparini et al (2009). For a comparison with other global regions see López & Perry (2008).

\(^3\) At a country level there are long-term inequality series for Uruguay (Bertola, 2005) and Chile (Rodriguez Weber, 2013). Both will be a valuable input in our work.
The first step to study inequality and its consequence in the region is to construct consistent series covering the long run. In recent years there have been important efforts in quantifying inequality in the region in the late XIXth Century and early XXth Century. Williamson (1999, 2002) estimated inequality indices as a ratio of GDP per worker to unskilled wages for the pre-WW2 period for a set of countries in the periphery (including Argentina, Brazil, Chile and Uruguay). Based on Williamson’s inequality indicators, Prados de la Escosura (2007) constructed pseudo Ginis over the last century for Argentina, Brazil, Chile and Uruguay (adding Colombia and Mexico since 1913). Frankema (2010) studied the pattern of change in the distribution of labour income shares in Argentina, Brazil and Mexico during the XXth Century, finding that in all three countries the labour income share peaked in the middle decades of the last century. Also Frankema (2012) examines the long-run industrial wage inequality in Argentina, Brazil and Chile based on benchmarks industrial surveys and census data. He founds that wage inequality in those three countries rose much faster during the second half of the last century than in other New World countries.

One important limitation of the above contributions – Frankema’s apart - is that they do not differentiate labour by skill level, or allow for changing sectoral allocation of the labour force over time. Thus they only provide a limited picture of trend behaviour and peaks over the long term, as they are either covering a shorter period (e.g., Williamson, 2002), are based on benchmark years (e.g., Frankema, 2012), or concentrate on a small sample of countries. Some of these limitations are addressed by FitzGerald (2008) who constructs a consistent set of yearly estimates of earning dispersion for four occupational groups that are used to generate Gini coefficients for the 1900-2000 period for Argentina, Brazil, Chile, Colombia and Mexico. However, one important shortcoming of these Ginis is that they rely on sectoral series of output per economically active person to estimate earnings levels in two of the four skills groups (see below). This implies well-functioning markets and that changes in relative earnings reflect those in productivity, a strong assumption for a developing region particularly during the early decades of the last century. We adopt the approach used by FitzGerald

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4 Bértola et al (2008, 2010) constructed Gini benchmarks (based on census data) for Brazil, Chile and Uruguay. But unfortunately for our purposes, such benchmarks are far apart, with only one in the last century (1920), and do not provide an indication of trends.
but calculate the earnings Ginis using real wage series for rural unskilled, urban semi-skilled labour and for relatively skilled labour.

The remainder of the paper is structured as follows. **Section one** summarises the procedure used to construct the earnings Ginis.** Section two** looks at the “proximate” causes of earnings inequality and examines real wages dynamics. **Section three** presents the earnings Ginis by country and compares them with other inequality measures. This section also includes analysis of peaks in inequality in terms of some key fundamentals as well as discussion of a regional aggregate. Finally there is a section of **Conclusions** and comments on a wider research agenda. **Annex A** includes spider charts with employment shares as well as line charts of real wages series (for skilled, semi-skilled and unskilled workers) and GDP per worker. **Annex B** offers detailed information by country on methodology and sources.

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5 This method is akin to the estimation of inequality from social tables used to study of inequality in pre-industrial societies (Milanovic et al., 2011; Lindert and Williamson, 1982).
2. **Methodology and data issues**

We divide the economically active population (EAP) into four groups according to the occupational categories used in the Panorama Social published annually by the UN Economic Commission for Latin America and the Caribbean (ECLAC). These four groups are shown in Table 1 below, which summarizes the ECLAC estimates for Latin America circa 2000, which is the baseline for our estimations of the EAPs by group.

The employment shares of these groups can also be estimated by aggregating categories for the distribution of the EAP by occupational groups (ISCO-68 and ISCO-88) provided by the International Labour Organization (ILO).

<table>
<thead>
<tr>
<th>Category</th>
<th>Share of EAP($n_i$)</th>
<th>Income ratio to average ($y_i/y_4$)</th>
<th>Income gap ($y_i/y_4$)</th>
<th>Education (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Employers, managers and professionals</td>
<td>0.09</td>
<td>3.34</td>
<td>6.82</td>
<td>11.4</td>
</tr>
<tr>
<td>2 Technicians, administrators</td>
<td>0.14</td>
<td>1.21</td>
<td>2.47</td>
<td>11.2</td>
</tr>
<tr>
<td>3 Urban workers, artisans etc</td>
<td>0.42</td>
<td>0.85</td>
<td>1.73</td>
<td>6.5</td>
</tr>
<tr>
<td>4 Rural workers and servants</td>
<td>0.35</td>
<td>0.49</td>
<td>1</td>
<td>3.5</td>
</tr>
<tr>
<td>(of which rural workers)</td>
<td>0.20</td>
<td>0.44</td>
<td>2.9</td>
<td></td>
</tr>
</tbody>
</table>

*Source: UN/ECLAC Panorama Social (2000).*

The main rationale for drawing the distinction between the four groups is differences in education levels and skills (as measured by their mean years of education). But the number of groups also reflects wage data limitations during most of the period covered. Also some arbitrary aggregation is difficult to avoid. For instance, in Group 1 (representing 9% of EAP of Latin America circa 2000) owners of capital are lumped together with employees, managers. Group 3 (14% of the EAP) includes the urban informal sector and highly skilled artisans with rather secure employment. Some other groupings with higher demands on income data are possible, for instance Portes and Hoffman (2003) develop a class-theoretical distinction between six "classes" defined by their control over skills and capital as well as their limited incorporation into the modern economy (i.e., fully monetised and legally regulated).
administrators of micro firms included in Group 2 can have earnings below those of relatively qualified workers in commerce (Group 3). Group 4 (35% of the EAP) includes rural workers (20%), together with workers in personal services, including domestic services (about 5% of the region’s EAP in circa 2000), largely in urban areas. As to the implications of the limited number of groups and the measured Ginis, Milanovic et al. (2010) found that differences in the number of groups or social classes have a limited effect on the estimated Ginis (this finding is confirmed by Modalsli, 2013).

Based on the four occupational categories a functional income distribution is defined as:

(1) \( \sum n_i y_i = 1 \)

The calculations are thus based on labour (wages) and capital (profits) only - although by implication natural resource rents privately gained are in Group 1 incomes. Because we are using gross domestic product (GDP) as our measure of total income, profits of foreign companies are included in Group 1, but remittances (more important in recent decades in Colombia and Mexico) are left aside as we are using wages to estimate workers’ incomes.

The key variables are the share \((n_i)\) of each group in the EAP, and the ratio \((y_i)\) of mean income in that group to that for the EAP as a whole. In what follows we describe the procedure used to calculate them.

**Employment shares**

The starting point in the construction of the yearly values for the EAP shares are ECLAC’s figures for circa 2000 (from *Panorama Social* of 2000). Then we move backwards following two estimating procedures. First we use all available data in ILO’s Yearbooks on the distribution of the EAP by occupational groups in order to estimate our four employment shares back to 1950 in most cases (see Annex B for details). To complete the employment shares from 1950 to 1900 we rely on three indicators (i.e. indexes with 2000 base) constructed by FitzGerald (2008) as follows (all basic data from MOxLAD):

- Group 1 (employers, managers and professionals). The indicator is the stock of university graduates as a proportion of the total of those with primary education.
The stock of educational graduates is found using the perpetual inventory method applied to the data on enrolment in primary and tertiary education.

- Group 2 (technicians and administrators). The indicator is total employment in manufacturing and public administration as a proportion of the EAP. Manufacturing employment comes from census data and public administration employment is estimated from levels of government expenditure.

- Group 3 (urban workers in commerce and transport, artisans, etc) are estimated as the residual from the other three groups. This is not just a statistical convenience, but is rather intended to reflect the process of internal migration, with the urban ‘informal’ sector acting as a sponge for surplus underemployed labour in the economy.

- Group 4 (rural labour and domestic servants). The indicator is the agricultural share of the EAP, from census data. This includes not only agricultural workers as such, but also small farmers (i.e. peasants) and family labour on a non-wage basis.

Table 2 presents the EAP shares for the four groups for selected years (all circa values). Figure A1 in Annex A shows spider charts by country with three-years averages every five years.

<table>
<thead>
<tr>
<th>Year</th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900</td>
<td>6.2</td>
<td>5.1</td>
<td>23.2</td>
<td>65.5</td>
<td>3.3</td>
<td>4.9</td>
<td>21.0</td>
<td>70.8</td>
<td>4.1</td>
<td>6.4</td>
<td>19.8</td>
<td>69.6</td>
</tr>
<tr>
<td>1920</td>
<td>6.0</td>
<td>4.5</td>
<td>29.1</td>
<td>60.4</td>
<td>3.5</td>
<td>4.8</td>
<td>20.9</td>
<td>70.8</td>
<td>4.6</td>
<td>6.5</td>
<td>29.4</td>
<td>59.6</td>
</tr>
<tr>
<td>1940</td>
<td>5.7</td>
<td>5.4</td>
<td>32.0</td>
<td>56.9</td>
<td>2.9</td>
<td>5.6</td>
<td>25.5</td>
<td>66.0</td>
<td>4.2</td>
<td>7.5</td>
<td>37.9</td>
<td>69.3</td>
</tr>
<tr>
<td>1950</td>
<td>6.1</td>
<td>8.7</td>
<td>33.2</td>
<td>52.0</td>
<td>2.9</td>
<td>6.5</td>
<td>26.7</td>
<td>63.9</td>
<td>5.7</td>
<td>8.7</td>
<td>42.4</td>
<td>43.2</td>
</tr>
<tr>
<td>1960</td>
<td>7.3</td>
<td>9.9</td>
<td>33.9</td>
<td>48.9</td>
<td>4.0</td>
<td>8.0</td>
<td>32.6</td>
<td>55.3</td>
<td>5.8</td>
<td>11.1</td>
<td>45.2</td>
<td>37.8</td>
</tr>
<tr>
<td>1980</td>
<td>7.5</td>
<td>13.9</td>
<td>39.8</td>
<td>39.8</td>
<td>7.2</td>
<td>11.4</td>
<td>40.8</td>
<td>40.5</td>
<td>12.5</td>
<td>17.4</td>
<td>45.9</td>
<td>24.3</td>
</tr>
<tr>
<td>2000</td>
<td>9.1</td>
<td>14.0</td>
<td>41.2</td>
<td>35.6</td>
<td>9.5</td>
<td>13.9</td>
<td>44.4</td>
<td>32.2</td>
<td>12.3</td>
<td>17.2</td>
<td>46.8</td>
<td>23.7</td>
</tr>
</tbody>
</table>

All figures are three years averages except those for 1900 based on two years.
Benchmark figures circa 2000 are from ECLAC (2000), except Argentina which are based on ILO's data.
Differences among the countries’ EAP shares are largely driven by variations in the urbanisation process and the timing of the structural change. Broadly speaking Argentina and Chile already have significant urban populations by 1900, reflected in relatively lower values for the economically active persons in Group 4; whereas Brazil, Colombia, Mexico and Venezuela started the XXth Century with shares for that group between 65% and 85%. Differences in the level of development at the start of the last century are also reflected in the timing of the decline of the share of Group 4. The initial Group 4 EAP share for Argentina (40%) is only reached by 1960 in Chile by 1955, in Venezuela, and around 1980 in Brazil, Colombia and Mexico.

**Relative incomes**

Relative income levels ($y_i$) are expressed as the ratio of average income in that Group to the mean income for the whole EAP.

- **Group 1.** The aggregate income share for the group is defined as the residual after aggregate incomes for the other three groups: this is then divided by the respective proportion of the EAP to yield the relative income level:

\[
y_1 = \left( 1 - \sum_{i=1}^{4} n_i y_i \right) / n_1
\]

- **Group 2.** Income levels of this group are calculated based on real wage series for relatively skilled workers (see below for more details).
- **Group 3.** Earnings levels in this group are estimated from real wages series for urban semi-skilled labour.
- **Group 4.** Earnings levels are estimated using the series of real wages for rural unskilled labour.

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7 The estimates for the urbanisation rates circa 1900 are: Argentina 38%, Chile 34%, Brazil 23%, Mexico 28.3 and Venezuela 11%. The first observation available for Colombia is 30.9% in 1938. See Annex B for sources.
Table 3: Relative income by occupational categories, selected years

<table>
<thead>
<tr>
<th></th>
<th>Argentina</th>
<th>Brazil</th>
<th>Chile</th>
<th>Angola</th>
<th>Brazil</th>
<th>Chile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G1 G2 G3 G4</td>
<td>G1 G2 G3 G4</td>
<td>G1 G2 G3 G4</td>
<td>G1 G2 G3 G4</td>
<td>G1 G2 G3 G4</td>
<td>G1 G2 G3 G4</td>
</tr>
<tr>
<td>1900</td>
<td>9.2 0.91 0.73 0.50</td>
<td>7.9 1.69 1.53 0.64</td>
<td>6.5 1.50 0.95 0.25</td>
<td>7.9 1.69 1.53 0.64</td>
<td>6.5 1.50 0.95 0.25</td>
<td>7.9 1.69 1.53 0.64</td>
</tr>
<tr>
<td>1920</td>
<td>9.9 0.91 0.67 0.39</td>
<td>11.8 1.49 0.92 0.44</td>
<td>5.5 1.26 1.02 0.48</td>
<td>11.8 1.49 0.92 0.44</td>
<td>5.5 1.26 1.02 0.48</td>
<td>11.8 1.49 0.92 0.44</td>
</tr>
<tr>
<td>1940</td>
<td>8.1 0.98 0.73 0.39</td>
<td>13.4 1.14 0.90 0.37</td>
<td>6.4 1.06 0.88 0.39</td>
<td>13.4 1.14 0.90 0.37</td>
<td>6.4 1.06 0.88 0.39</td>
<td>13.4 1.14 0.90 0.37</td>
</tr>
<tr>
<td>1950</td>
<td>3.5 1.47 0.87 0.44</td>
<td>12.0 1.08 0.34 0.54</td>
<td>5.3 1.22 0.94 0.44</td>
<td>12.0 1.08 0.34 0.54</td>
<td>5.3 1.22 0.94 0.44</td>
<td>12.0 1.08 0.34 0.54</td>
</tr>
<tr>
<td>1960</td>
<td>5.7 1.07 0.68 0.39</td>
<td>13.0 0.98 0.78 0.34</td>
<td>5.3 1.03 0.82 0.25</td>
<td>13.0 0.98 0.78 0.34</td>
<td>5.3 1.03 0.82 0.25</td>
<td>13.0 0.98 0.78 0.34</td>
</tr>
<tr>
<td>1980</td>
<td>7.5 0.80 0.33 0.23</td>
<td>10.4 1.10 0.29 0.21</td>
<td>2.7 1.34 0.83 0.39</td>
<td>10.4 1.10 0.29 0.21</td>
<td>2.7 1.34 0.83 0.39</td>
<td>10.4 1.10 0.29 0.21</td>
</tr>
<tr>
<td>2000</td>
<td>5.1 0.73 0.37 0.14</td>
<td>7.5 1.31 0.34 0.24</td>
<td>3.2 0.97 0.54 0.36</td>
<td>7.5 1.31 0.34 0.24</td>
<td>3.2 0.97 0.54 0.36</td>
<td>7.5 1.31 0.34 0.24</td>
</tr>
</tbody>
</table>

Note that a potential bias is introduced when estimating incomes at group level. We assign the average wage (as a proxy for average earnings) to the EAP of each group (and not only to those employed), while the mean income for the overall EAP is proxied by the GDP per economically active person (so including the unemployed in the denominator). That means that at times of high unemployment, our series are overestimating the relative income levels \( y_i \) - expressed as the ratio of average income in that group to the mean for the whole EAP – of groups 2, 3, and 4 and underestimating the income accruing to Group 1 – calculated as a residual, therefore, underestimating inequality. This bias can be especially relevant during the early years of the Great Depression.

**Terms of trade adjustment**

The use of real GDP in our calculations as the measure for overall income also presents a complication, as it does not include the direct impact of the terms of trade in overall income. This is especially relevant in those economies that have experienced significant changes in their terms of trade. For instance, in the case of Venezuela, the four-fold rise

\[ y_i = w_4/GDP_{PW}, \]

where \( w_4 \) is the average real wage for the unskilled rural workers divided by overall GDP per economically active person (both in monthly terms). However, to be consistent with the denominator, we should be using the average earnings of the EAP in that group in the numerator (i.e., \( Y/EAP_{p4} \)). Thus, in times of growing unemployment our numerator is less sensitive to the destruction of jobs (particularly if there is wage rigidity) and as a result the relative income level of the group is overestimated.

---

8 For example, in the case of Group 4, we calculate \( y_i = w_4/GDP_{PW} \), where \( w_4 \) is the average real wage for the unskilled rural workers divided by overall GDP per economically active person (both in monthly terms). However, to be consistent with the denominator, we should be using the average earnings of the EAP in that group in the numerator (i.e., \( Y/EAP_{p4} \)). Thus, in times of growing unemployment our numerator is less sensitive to the destruction of jobs (particularly if there is wage rigidity) and as a result the relative income level of the group is overestimated.
in oil prices in 1974 generated a significant increase in the purchasing power of the country’s exports. However, as export volumes remained roughly unchanged, this positive income effect is largely missing from the real GDP series. This could be avoided by using nominal GDP figures, but these are not available for all of our countries during the first half of the last century. To correct for this bias we adjust our original figures of GDP per worker to reflect the purchasing power of the total incomes generated by domestic production, including the impact of changes in the terms of trade. The adjusted income is equal to gross domestic product at constant prices plus the trading gain (or less the trading loss) calculated as the difference between the income terms of trade (also known as purchasing power of exports) and the volume of exports.\(^9\)

Table 4 shows the proportional size of the adjustment by decades for each country and the LA-6 weighted average.

![Table 4: Terms of trade adjustment](image)

The commodity lottery is the cause of difference across countries. Oil producers such as Mexico and Venezuela and - to a lesser extent – Colombia, are positively affected since 1970. The main energy importers (Argentina, Brazil and Chile) saw their trade gains from their main commodity exports (grains, coffee and copper) more than offset by the higher import bill in recent decades. The middle decades – dominated by the

\(^9\) This adjusted GDP is called Real Gross Domestic Income; a measure commonly included in the statistics published by bodies such as the OECD and the Australian Bureau of Statistics.
protectionist policies – show a lower terms of trade contribution but this is still significant – and positive - in countries such as Venezuela. LA-6 showed a net gain, benefited during the early decades of the last century and the first of the current one, where there was a general favourable trends in commodity prices.

Finally, in order to calculate the relative income levels \((y_i)\), we need monthly income per worker series consistent with our wage data. We proceed as follows. First we calculate a weighted average monthly wage from our series in 1970 (using the groups’ EAP shares as weights). Second, we use ILO’s data - where available - on the wage share of total income in that year in order to calculate an income per worker value in 1970 consistent with our estimated average wage level. Then we use the growth rate of the terms-of-trade adjusted GDP per worker (at 1970 prices) to go back to 1900 and forth to 2011.

**Real wages**

We rely on real wages to proxy earnings for the three occupational categories. Ideally, we should be using wage series defined according to skills. But, unfortunately, these data are rarely available, particularly for the early and middle decades. The core values for the wage series are provided by PREALC (1983). This source offers comparable data for nominal and real wages on a monthly basis by sectors (agriculture, manufacturing and construction), as well as minimum urban wages for 18 Latin American countries including our LA-6. The period covered by PREALC ranges, in most cases, from 1965 to 1980. Real values are at 1970 prices in local currencies. In order to have comparable levels in a single currency across countries we calculate PPP$ values using the PPP exchange rates available for 1970 (ECLA). To complete our wage series for the whole 1900-2011 period, we splice wage series from other sources to the core PREALC levels by applying rate of growth backwards from circa 1965 and forward from circa 1980. Annex B offers further details on sources and assumptions.

For Group 2 we set the levels with the PREALC average wages for manufacturing. Then, for the remaining years we use similar series, and, when this is not available,

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10 The wage shares circa 1970 (three year average) are: 38.8% in Argentina, 51.4% in Chile, 41.9% in Colombia, and 48.1% in Venezuela. For Brazil and Mexico we use estimates of 40% and 50.8% respectively from Frankema (2010).
wages in the public sector for relatively skilled employees such as mechanics or mid-range officers (e.g. Colombia). For Group 4 we use primarily, with some variations among countries and periods, wages in agriculture for unskilled workers, which in some cases are complemented by wages for unskilled government employees (e.g. Colombia in the early decades).

Group 3 requires some additional explanation. Here we have two PREALC series with useful information: wages in the construction sector, and minimum urban wages. The former is usually an average of manual workers with a range of skills, while the latter reflects the remuneration to unskilled urban workers. In order to estimate wage levels for semi-skilled workers during we calculate an average of both series – where available - using as weights estimates of the share of the informal sector in urban employment by country from PREALC (1982, 1990) and Frankema (2010). This is also to reflect the fact that, with the increase in urban informality, there was also a growing income gap between the formal and informal sectors in the urban sector. As in Frankema (2010, 358) we assign the urban minimum wage as a shadow earnings to workers in the informal sector. This weighting is necessary to avoid overestimating the income share of Group 3 that would arise by assigning the average construction wage to workers in both the formal and the informal sector.

Then to complete the series there are country variations determined by the availability of data (see Annex B for details). For instance, in Argentina we use average wages of non-agricultural sectors (excluding government) from 1913 to 1965. In Colombia and Venezuela there are series of construction workers available from 1927 and 1900 respectively. For Chile we use daily wages in the food industry up to 1930 and then urban daily wage up to 1965. In the cases of Brazil and Mexico we tend to rely on growth rates of series of minimum urban wages to move back and forth from our core values. This is justified by an expected close correlation between the minimum wage and that of the relatively unskilled urban workers.\(^{11}\)

\(^{11}\) Camargo (1984) in a study of minimum wages in Brazil during the period 1940-1980 found that the minimum wage was the relevant parameter for determining the rate of pay of unskilled workers in the country and that it also influenced the blue collar pay rates. However, in the case of managerial or administrative employees (our Groups 1 and 2), the profits rate and the relative availability by occupations were the key factors.
Wage premia

Table 5 presents information about the resulting skill premia calculated with our wage series. Two wage ratios are shown: that of skilled urban workers to unskilled rural workers \( (w_2/w_4) \) or dual ratio; and that of the skilled to the semi-skilled in urban areas \( (w_2/w_3) \) or urban ratio.

### Table 5: Skill premia by five-year periods

<table>
<thead>
<tr>
<th>Year</th>
<th>Argentina dual</th>
<th>Argentina urban</th>
<th>Brazil dual</th>
<th>Brazil urban</th>
<th>Chile dual</th>
<th>Chile urban</th>
<th>Colombia dual</th>
<th>Colombia urban</th>
<th>Mexico dual</th>
<th>Mexico urban</th>
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<th>Venezuela urban</th>
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<td>2.00</td>
<td>1.68</td>
<td>2.00</td>
<td>1.68</td>
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<td>2.00</td>
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<td>2.00</td>
<td>1.68</td>
<td>2.00</td>
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<td>1.35</td>
<td>2.36</td>
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</table>

\((w_2/w_4)\) skilled urban vs. unskilled rural; \((w_2/w_3)\) skilled vs. semi-skilled urban.

All values are three-years averages except 1900 that averages the values for 1900 and 1901.

The circa values for 1965 and 1980 usually reflect PREALC data. We are also highlighting peak values. The regional simple average for the wage ratios circa 2000 (not shown) are 3.8 for the dual ratio and 2.1 for the urban ratio, which are higher than the 2.5 and 1.7 values shown in Table 1 (based on a sample of eight countries). However, our values are boosted by high values from Brazil. Without Brazil the averages are 3.5 and 1.7 respectively. Also, both ratios circa 1915 for Argentina are
consistent with those calculated with detailed data from the 1914 census (Aráoz, et al., 2013).

In general, the wage ratios tend to be stable and relatively low during the first half of the last century or so, and then to widen during the second half (Colombia dual ratio is the exception presenting an erratic behaviour). Regarding the skilled-unskilled gap, it accelerates in Argentina and Brazil in the 1960s and 1970s (this may partly reflect hyperinflation) and then again post 1990. Chile, Colombia, Mexico and Venezuela show peaks for the dual ratio during 1950 and 1960; while Argentina and Brazil peaks are later in 1990. In Venezuela the rapid process of urbanization brought about by the development of the oil industry in the 1920s and 1930s – and the spending of oil revenues in cities - is likely to be behind the relatively early peak in the dual ratio (Astorga, 2000).

The data on prices (relative incomes and wage ratios) and quantities (employment shares) are broadly consistent with the Kuznets-Lewis story. The early decades were characterised by a high proportion of rural unskilled labour force with polarised income between the earnings of the top group (for us G1) and the bottom group (G4). Here the gap between rich and poor largely reflects disparities between capital or land owners and relatively low skilled workers. Manufacturing was dominated by the cottage industry – small scale workshops.

Then as a result of a process of internal migration, G1 shrinks and G2 and G3 expand. This initial reallocation of labour from low to higher productivity translates into a rising wage gaps. As the process of internal migration got underway it was expected that the urban labour force improved their educational levels and skills while the fall in the rural workforce and the modernisation of agriculture bids up their wages. However, there is a well-known twist to the standard Kutznets process in Latin America. The industrialization process stagnated in the last quarter of the last century and workforce growth swell the urban informal sector creating the conditions for a worsening in inequality. This effect was reinforced by the change in the trade strategy in the closing decades of the last century.
Thus the ratios in the “lost decade” of the 1980s and the 1990s tend to reflect a regressive movement in income distribution (so widening gaps) driven by relatively skilled-bias technological change in the context of trade liberalization and a rise in labour informality. Also, there is a tendency for a leveling-off or a decline of the wage premia in the 2000s as the region benefited from the latest commodity boom (Mexico being an exception). This development has been singled out as one of the key factors responsible for the decline in personal income inequality during the period (López-Calva and Lustig, 2010). We will look more closely at the possible links between the behavior of the wage premia (particularly peaks) and developments in fundamentals such as urbanisation or sectoral productivity gap in Section 4.

3. Proximate causes of earnings inequality

At a “proximate” level we can think of earnings inequality as the combined contribution of three factors: intra-wage groups dispersion (wage compression or expansion); changes in the labour share (indicating functional income distribution),\(^\text{12}\) and changes in the composition of the labour force (i.e., weights of the four occupational groups). The income-related causes dominates in the shorter to medium term, whereas the labour weights make most of their contribution in the longer term. In what follows we concentrate on the income-related causes. The labour share is calculated as the ratio between the average weighted real wage divided by the real GDP per worker. Note that our Group 1 (employers, managers and professional) also include wage earners, but these are a minority compared to those included in the other occupational groups.

Diagram 1 shows the possible combination of different outcomes for both the labour share and wage dispersion and the likely impact on inequality. In those cases when both factors reinforce each other the net impact is unambiguous (either a rise or a decline in inequality). However, there are two combinations in which the direction of the change is uncertain and will depend of the relative weight of the two proximate causes. Meanwhile, a sustained fall in the labour share - for a constant wage dispersion - will worsen inequality, whereas a rise will indicate the closing of the gap between wage and non-wage earners and a narrowing in earnings inequality; whereas for a constant labour

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\(^{12}\) The inverse of the labour share also accounts for the degree of polarisation between top earners and the rest of the labour force.
share, a wage compression will reduce inequality. Figure 1 below offers time series on those two components by country.

Diagram 1: inequality impact

<table>
<thead>
<tr>
<th>Wage dispersion</th>
<th>Labour share</th>
<th>declining</th>
<th>constant</th>
<th>rising</th>
</tr>
</thead>
<tbody>
<tr>
<td>narrowing</td>
<td>(1) ambiguous</td>
<td>lower</td>
<td></td>
<td></td>
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<tr>
<td>constant</td>
<td>higher</td>
<td>unchanged</td>
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</tr>
<tr>
<td>widening</td>
<td>(3) higher</td>
<td>higher</td>
<td>ambiguous</td>
<td>(4)</td>
</tr>
</tbody>
</table>

At this point we are particularly interested in identifying periods in which the secular movements in both factors indicate an unambiguous inequality outcome - either rising or falling – corresponding to cells (2) and (3) in the diagram. They should provide more robust evidence (i.e., less prone to potential error measurement as well as the impact of short term fluctuations). Some patterns can be indentified in Figure 2:

- Regarding labour shares, the closing decades of the XXth Century and the 2000s are dominated by falling trends. The decline starts in the late 1960s in Argentina, the early 1960s in Brazil, the late 1980s in Chile and Venezuela, the early 1950s in Colombia, and the early 1980s in Mexico. Prior to that, the tendency for the secular labour share was to fluctuate around a constant – and relatively high – value. Although, during the 1930s, rising labour shares was the norm. This was prolonged into the 1950s in Argentina (first Perón government), and into the 1940s in Chile. Chile and Mexico also experienced rising labour shares in the 1960s and 1970s. High values in Brazil in the 1900s and 1910s are likely to be data anomalies reflecting an underestimation of the GDP per worker; whereas in Mexico and Venezuela in the 1900s may reflect an overestimation of wages.

---

13 Falling labour shares since the 1970s or so is a common feature in both developed and developing countries and has been attributed primarily to globalisation, the increased role of financial activity, and labour market de-regulation (Stockhammer, 2012, ILO report).
Regarding secular movements in the wage dispersion, there are some outcomes to highlight. In Argentina a rising trend with a peak in the mid 1980s, implying an underlying move towards increased inequality. In Brazil, the rising trend in wage dispersion starts in the late 1950s, coinciding with the decline in the labour share, implying underlying rising inequality. In Chile, also, secular dispersion accelerates in the late 1950s, and will coincide with a falling labour share after the early 1980s. Colombia shows a rising dispersion trend up to 1960 and then a falling trend, in this case offsetting the downward trend in the labour share. Mexico shows a similar pattern to that in Argentina, with the peak in late 1970s, coinciding with the start of the downward trend in the labour share. Finally, Venezuela has a period of unambiguous inequality impact starting in the mid 1980s coinciding with the collapse in oil prices.

All in all, the above evidence indicates, first, the absence of cases in which rising labour shares and wage compression reinforce each other, generating a sustained fall in secular inequality. The late 2000s show rising or stable labour shares but little wage compression. And, second, a number of periods of rising inequality in the second half of the last century characterised by declining labour shares and widening dispersion. They are: early 1960- late 1980 in Argentina; 1960 to early 1990 in Brazil; mid 1980s to late 2000s in Chile; Colombia mid 1950s to early 1970s; Mexico 1980 to 2000; and Venezuela mid 1980s to 2010. These are the likely periods to locate peaks in inequality.
**Patterns in averages and dispersion**

Figure 1 can also be useful to identify common patterns and to single out differences that could inform on the workings of the labour market. We now focus the attention on the comparison between the average real wage and the dispersion in wages. The average wage is calculated as the weighted average (using employment shares as weights) of real wages for Group 2 (skilled), Group 3 (semi-skilled) and Group 4 (unskilled). We use the standard deviation of these three wage series as our dispersion measure.

Diagram 2 depicts the possible combinations between the behaviour of wages and their dispersion. The possible outcomes of interest are: (1) falling average wage accompanied by a narrowing in the wage dispersion (catch up towards the bottom of the wage scale); (2) rising average wage and narrowing dispersion (catch up towards the top of the wage scale); (3) falling wages and widening dispersion (divergence with misery); (4) rising wages with widening dispersion (divergence under prosperity); and (5) constant real wage and constant dispersion. These combinations can facilitate the reading of Figure 2.

**Diagram 2: real wage dynamics**

<table>
<thead>
<tr>
<th>Wage dispersion</th>
<th>Average real wage</th>
<th></th>
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<tr>
<td></td>
<td>falling</td>
<td>constant</td>
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<tr>
<td>narrowing</td>
<td>(1) catch up</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bottom</td>
<td></td>
</tr>
<tr>
<td>constant</td>
<td>(3) divergence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>misery</td>
<td></td>
</tr>
<tr>
<td>widening</td>
<td>(5)</td>
<td></td>
</tr>
</tbody>
</table>

In (1) those at the top see their wages approaching those at the bottom (shared misery). Although there is overall downward real wage flexibility (so that, for instance, currency devaluation has lasting effects), the adjustments happen at a different speed implying some limited downward rigidities with the labour market. This can be influenced – particularly in periods of relatively low wages – by a natural lower bound (e.g. dictated
by subsistence level) or by the presence of minimum wage legislation. In (4) workers with higher skills benefit the most. This can be the result of skills-biased technological change or structural change (widening skill premia).

Situation (2) is of particular interest as it may reflect labour market regulation or institutional changes (e.g., minimum wage or union formation). Intervention in the labour market aiming to reduce dispersion or to raise the minimum wage could be reflected in two outcomes: i) rising average wage and stable or narrowing dispersion; or ii) stable average wage and narrowing dispersion. Graphically this would look like a “scissors effect”. (3) depicts situations of prolonged economic downturn and lack of lower bound in wages (unlikely situation). (5) is consistent with stable macroeconomic environment and no major changes affecting the labour market. Alternatively this can indicate full flexibility in real wages.

Diagonals and lines across in Diagram 2 – which are combinations of individual categories - can inform about the behaviour of wages over the economic cycle:

- Synchronicity (downward diagonal): those with higher skills outperform during prosperity but underperform during downturns.
- Mirrors (upward diagonal): this implies a path with asymmetric real wage rigidity during downturns and unskilled intensive growth in the upturn.
- Wave (vertical arrow): stagnant economy with changes of luck – some sort of Malthusian trap.
- Herding behaviour (horizontal arrow): full flexibility in real wages upwards and downwards.

The Kuznets process can be represented in the diagram as a move from (5) to (4) and then to (2).

The above categories can help to identify some patterns emerging in Figure 1:
- Synchronicity dominates changes in the mean and dispersion of real wages, especially since circa 1970 in Argentina, Chile, Mexico and Venezuela. The exception is Colombia that shows a rather erratic behaviour.
- The early decades are dominated by labour markets with relatively stable real wages and dispersion.
There is an acceleration of dispersion during the middle decades that is consistent with structural change and the industrialisation drive (skills biased). Wage dispersion accelerates again in the 2000s in Argentina, Brazil and Chile.

There are a number of episodes that could point to state intervention in the labour market (scissors pattern): Argentina (mid 1930s-mid 1940s); Brazil (mid 1940s to circa 1960); Chile (second half of 1910s, mid 1940s to end 1950s); Colombia (1960s; 1980s and 2000s); Mexico (mid 1940s to circa 1960).

What seems to be largely missing in all six countries is market-driven episodes of “rising wages and falling dispersions” (“scissors pattern”), like those identified during the post-war growth miracle in Europe and US (Goldin & Margo, 1991). Those cases where this combination occurred (e.g. Argentina around 1940; and Chile around 1950) were short-lived and likely to have been largely the result of government intervention in the labour market. Frankema (2012) has stresses the importance to take into account national policies with respect to education and the labour market to account for patterns in wage differentials in Argentina and Chile in those decades.

Our wage evidence supports the claim that during the first export-led growth period immigration, lack of a well-integrated labour markets and coercion, undermined the potential of demand-led growth based on unskilled labour to reduce wage dispersion. All in all, one key message of these charts is that limited skills formation seems to have acted as a main obstacle for the reduction – or stability – in wage dispersion during the upturns of the economic cycle (as captured by the synchronicity pattern). The accumulation in human capital and the acquisition of skills is a key variable for the evolution of earnings inequality (e.g., Lindert & Williamson, 1985) and is something that needs further research. Next we use this basic information on prices (wages as a proxy for income) and quantities (employment shares) to calculate time series of earning Ginis.

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14 Bulmer-Thomas (1994, p.87 on labour markets prior to WW1): “Real wages in the export sector were often unchanged over long periods of time, and in some cases they even decline. Employers were extremely reluctant to temp workers with the offer of higher wages. …Coercion …was still found in many parts of Latin America on the eve of the First World War.”
4. *Earnings Ginis*

To calculate the ‘four group’ earnings Gini coefficient \( (G_f) \) we employ the ‘trapezoid method’ as in Gastwirth & Glauberman (1976):

\[
G_f = 1 - \left[ y_1 n_1 (2 - n_1) + y_2 n_2 (2(1 - n_2) - n_3) + y_2 n_2 (n_2 + 2n_1) + y_1 n_1^2 \right]
\]

The above formulation is equivalent to calculate the “between-group” inequality component of the standard decomposition of the Gini coefficient. We are assuming that all individuals within a group earn the mean income of such a group.\(^{15}\) We leave for later an attempt to add estimates of within-group inequality – where possible - so as to provide a measure of overall earnings inequality.

Also, we are not making any attempt to deal with regional dispersion within countries. This was particularly important during the early decades of the last century when labour markets were not well-integrated allowing for inter-regional differences in earning for equivalent jobs. For instance, Jaramillo et al (2000) found significant differences for unskilled wages in the construction sector across regions in Colombia. Also there is evidence of significant wage dispersion for unskilled rural workers in Venezuela at the start of the century with higher wages for rural workers in the coffee-growing areas (McBeth, 2012). And there is evidence of significant regional variations in minimum wages in Mexico (ITAM data set).

*Comparison with other inequality measures*

Figure 2 presents our earning Gini series (Earn-G) – five-year moving averages - by country, together with three alternative inequality measures. First, available household Ginis (HH-G) sourced from from Altimir (see Thorp, 1998, Statistical Appendix), Szekely’s data set and ECLAC. Secondly, the inverse of the Williamson measure (i.e., the ratio of GDP per capita to the real urban wage) from 1900 to 1940 (W-ratio) in four countries. And, third, Frankema’s Theil index of inter-industry inequality (with a fitted moving average line).\(^{16}\)

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\(^{15}\) Relying on between-group inequality is a common feature in inequality studies covering the long run (Milanovic et al., 2011).

\(^{16}\) We show the inverse ratio (1913=1) of the original five-year averages in Williamson (1999, table 8, 134) for Argentina, Colombia and Mexico. In the case of Brazil we present the ratio for the Southeast
We calculated an index (1996=1) using original data in Frankema (2012). We drop an outlier observation in 1984 for Chile. Both indices are plotted on the right-hand side scale of the charts; whereas the two Ginis use the scale on the left-hand side.
Two aspects of the estimation procedure to highlight:

- **Chile 1900-1930.** We are adopting the estimates of Rodriguez Weber (2008). Our estimates fit very closely with those of Rodriguez Weber during 1916-1930, but show a divergence before 1916.

- **Mexico 1911-1920.** Because of the distortions caused by the hyperinflation during the revolution, as well as data limitations we opted to estimate separately the earnings Gini for the 1900-1910 period using the data available on nominal wages and GDP from the *Estadísticas del Porfiriato* (see Annex B). Then, we constructed Gini values from 1921 onwards by linking wage series to the benchmark PREALC series for the 1965-1980 period. This means that the levels pre-1910 are not fully comparable with those after 1920.

The comparison with the household Ginis from a more recent period serves the purpose of assessing the capacity of our earnings Ginis to reflect the behaviour of an inequality measure with superior information. For the post 1950 years up to 2000 our series fits reasonably well the trends and fluctuations observed in the household Ginis available, especially in the case of Argentina, Brazil, Chile and Mexico. This gave us some reassurance that the early estimates can also be a good proxy for the “true” income inequality during the first half of the last century. On the other hand, the inclusion of the Williamson ratios, constructed with less information, aims to check the extent to which our new measure supports claims made based on those ratios. Meanwhile, intra-industry wage differentials are likely to capture the impact of differences in productivity and technological sophistication – and the demand on skills - across industries (Berman et al., 1998). This inequality is likely to have a bearing in differences in wages across the four occupational groups.

Note that our series reflect inequality before net taxes and transfers, whereas the household Ginis are based on disposable income after net taxes and transfers. Although, in developed economies with strong welfare states, there tend to be significant differences between Ginis pre and post net taxes and transfers, in Latin America, both measures are close together. For instance, Goñi et al. (2006) report a difference of only two percentage points between both Ginis for an average of six Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico, and Peru) by the end of the last century. Therefore our earnings Ginis do not take into account the impact on inequality
of a series of recent social transfer programmes which is one of the reasons behind the observed narrowing in inequality in the last decade of the new century as reflected in Ginis based on disposable income.\textsuperscript{17}

With the exception of Colombia, the new series tend to be consistent with the inverse Williamson ratio (1900-1940), particularly in showing increasing inequality up to about 1920. This gives additional support to claims that the First Globalisation brought about a significant increase in inequality and that the colonial roots may have played a lesser role – at than that implied by the institutionalist approach in accounting for high inequality levels observed in the closing decades of the last century.

According to our estimates, the two mayor growth crises hitting the region during the early 1930s (Great Depression) and the first half of the 1980s (Debt Crisis) brought about a decline in earnings inequality. The latter is also captured by the behaviour of personal Ginis. In the worst years of the Great Depression (1930-1933) this was the result of a higher labour share (suggesting that profits and rents suffer most of the adjustment) that more than offset an expansion in wage dispersion. Whereas during the worst years of the Debt Crisis (1982-84), the narrowing in inequality reflected the reinforcing effects of wage compression and higher labour shares. However, because of the possibility of a bias in our estimation in periods of unusually high unemployment (see page 8), there exists the possibility that this result is a statistical illusion, particularly during the 1930s.

We can have an indication of the potential statistical bias by using data available for the unemployment rate for Mexico during the period 1931-1940 (in Wilkie, 1971, based in turn on \textit{Dirección General de Estadística}). According to these data unemployment peaked at 6.5\% in 1932 and then fell to between 3\% and 4\% from 1935 to 1940. Taking the latter levels as the natural rate, the unemployment doubled during the worst years of the Depression. Our calculations show that after adjusting the GDP per worker series by unemployment above trend, there is an increase in the earnings Gini (so indicating higher inequality because of larger income of Group 1).\textsuperscript{18} However, this adjustment

\textsuperscript{17} For instance, conditional cash transfer programmes in Chile, Peru and Mexico, Bolsa Familia in Brazil, and Misiones in Venezuela (Roberts, 2012).

\textsuperscript{18} We assume that the overall jobless rate in the same for all groups.
does not reverse the direction of changes in inequality that falls 4.7% year-on-year between 1929 and 1932 (compared to -6.1% using the original values) and rises 3.4% between 1932 and 1935 (compared to 4.1%).

There also tend to be consistency between the underlying trends in Frankema’s intra-industry inequality and those shown by the earnings Ginis, particular in the cases of Argentina, Brazil and Mexico. In Chile earnings and intra-industry inequality declined between the early 1960s and the mid 1970s, and then picked up since circa 1980. The acceleration in inequality since 1960 or so in both measures indicates that skills-biased technological change was a key driver for increasing wage gaps, both during the state-led industrialisation – plus protectionism - of the middle decades and during the closing decades of the last century dominated by more open economies and trade liberalisation.

**With-group inequality**

[Still to be done]

We will attempt to estimate within group inequality for two or three of our countries (Argentina, Chile and, perhaps, Brazil). This will allow for the estimation of a more complete inequality measure and will give some idea of the relative importance of between-group and within-group components in the evolution of overall earnings inequality.

Next we explore the consistency between the peaks in the wage premia and developments in key fundamentals. A more detailed and deeper study of the role of fundamentals in shaping inequality will be left to a forthcoming contribution.

**Peaks and fundamentals**

Table 6 offers a first look at the possible role of changes in secular forces paying special attention to peaks and turning points. It includes peaks in the sectoral productivity gaps (manufacturing vs. agriculture); urbanisation (with two dates: the inflection point and the levelling off of the process); and the year when the population growth starts its decline. On the latter, the table also shows the year of the likely delayed impact on the labour market (assumed to be 20 years). This information can be used to assess the plausibility of peaks in both the wage ratios and in the earnings Ginis.

19 We aim to perform the same exercise for the 1980s. Although, in this case, the adjustment was driven more by lower wages than by higher unemployment.
Table 6: Peaks in skill premia and fundamentals (circa values)

<table>
<thead>
<tr>
<th>Fundamentals</th>
<th>Argentina</th>
<th>Brazil</th>
<th>Chile</th>
<th>Colombia</th>
<th>Mexico</th>
<th>Venezuela</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urbanisation rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inflection point</td>
<td>1930</td>
<td>1950</td>
<td>1940</td>
<td>1940</td>
<td>1940</td>
<td>1940</td>
</tr>
<tr>
<td>Demographic transition</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Skill Premia</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: skill premia and earnings Ginis are our estimates. Urbanisation rates are our calculations based on census data. Otherwise uses MOxLAD.

What link is to be expected between the wage premia and these fundamentals? The peak in the productivity gap should be reflected in a widening in the skilled urban/unskilled rural gap (i.e. near peaks). This tends to be the case for Chile, Colombia, Venezuela and Mexico circa 1950. In the case of Argentina and Brazil the peak in the productivity gap (1975) precedes the peak of the wage premia for the dual ratio (1990) and the urban ratio (1980).

The levelling off in the urbanisation rate (1990-2000) tends to be accompanied by stability in the urban-rural wage gap up to about 2000 and then by a declining trend (see Table 5). This seems to be the case of Argentina, Brazil and Mexico. But the growing importance of informality since the 1970s or so is likely to have worked in the opposite direction. This may explain part of the tendency for rising (or steady) values in the urban premium since 1970 (see Table 5).

As to the demographic transition, in general, the delayed impact of the slowdown in population growth on the labour market was expected to begin its impact in the 1970s-1990s (earlier in Argentina). Other things being equal, this effect, together with the rise in economic emigration since the 1980s, are factors likely to have favoured wages. This may be part of the reason behind the decline – or stability - in the wage premia in the 1990s and 2000s.
A number of hyperinflation episodes are also likely to have affected the wage ratios. These are: Argentina in 1970s and 1980s; Brazil in 1980s and early 1990s; Chile in the second half of the 1950s and the 1970s. For the early decades there were two of such episodes: Colombia in the early years of the 1900s and Mexico in the middle of the 1910s – at the time of the Revolution. Thus, it is hardly a coincidence that the peak years for inequality in Argentina, Brazil, and Chile occurred in times of hyperinflation - or were just preceded by them.

**Wage convergence and inequality ranking**

[Still to be done]

This section will examine differences in levels and in the countries’ relative positions in the light of developments in convergence – or lack of it – in the three wage series across the LA-6.

**Regional aggregates**

For the calculation of overall inequality in the region we add Bértola’s series for Uruguay. This allows us to calculate regional averages - simple and population-weighted - for seven Latin American countries (LA-7). We also calculate the simple average inequality curve for the Southern Cone – Argentina, Chile and Uruguay. This separation is of interest because this group of countries industrialised relatively earlier and could display different inequality-growth dynamics. Figure 4 shows the series – all 5-year moving averages – and a polynomial fitted line for the weighted aggregate to reflect secular movements.
The regional averages show the presence of a secular process resembling an “M” shaped curve for the period 1900-2011, with turning points circa 1930, 1950, and 1980-1990. So increasing inequality during the earlier decades can equally be attributed to the First Globalisation, or to the industrialisation process (particularly in the Southern Cone and Mexico). Then the improvement in inequality that follows could be explained in terms of protectionist policies favouring urban workers and the start of a declining trend of the Kuznets process.\textsuperscript{20} However, the period of narrowing inequality is relatively short-lived, since by the early 1960s inequality started to pick up. Then inequality levels reached a plateau circa the debt crisis that lasted about two decades, before beginning to decline with the turn of the new century. This “M” shape is more pronounced in the case of the Southern Cone countries, indicating that the overall pattern in the LA-7 is driven by that group of countries.

5. Conclusions and research agenda

We have presented a new set of earnings Ginis for the period 1900-2011. The calculation of this inequality indicator required us to assemble a consistent set of yearly

\textsuperscript{20} Interestingly, Milanovic (2011) also identified a similar pattern in inequality (though he talks about a “reclined letter S”) in the evolution of inequality in West Europeans countries and the US, with the declining portion of the “inverted U” curve transformed into a rising portion since the Thatcher-Reagan era.
real wage series reflecting differences in skills for our six Latin American countries. The basic wage series are still preliminary, though we are already taking into account most of the data available. We may also need to fine tune some of the assumptions made to complete the series where data was lacking (e.g., in Brazil during late 1920s and early 1930s, Mexico in the 1930s, and in Venezuela in early decades). However, potential changes in these areas are unlikely to alter radically the results presented here.

For the next draft we aim to incorporate two sub-sections: (i) an attempt to estimate within group inequality for Argentina, Chile and, possibly, Brazil; (ii) to examine differences in levels and in the countries’ relative positions in the light of developments in convergence – or lack of it – in the three wage series across the LA-6.

The assessment of the earnings Ginis and the underlying wage series show that:

- Inequality exhibits changing secular trends as well as fluctuations in the shorter to medium term. Common recessions in early 1930s and early 1980s brought about narrowing inequality followed by rising inequality during the recovery. There are other episodes of declining inequality in the middle decades associated with a more interventionist approach in the labour market, but they tended to be short-lived. By the early 1960s inequality started to accelerate in most countries and peaked in the closing decades of the last century.

- The regional earnings Gini aggregate (single and weighted average of our six economies plus Uruguay) shows an “M” shape with turning points in the late 1920s (peak), circa 1950 (trough), and 1980-90 (peak). This shape is more pronounced in the Southern Cone countries. This pattern supports claims of rising inequality trends during the First Globalisation and is consistent with recent evidence of a decline in inequality since the start of the current century. Also, the location of the two peaks agrees with the likely effects of the Kuznets-Lewis process and changes in the trade-growth strategy (FitzGerald, 2008).

- The tag of a perennial high-inequality attached to the region seems to have been partly the result of a confluence of both economic and statistical developments. The first co-comprehensive attempts to measure personal inequality - with data from household surveys - coincided with the time when inequality was peaking or levelling off in many countries. This was compounded in Argentina, Brazil, and
Chile by episodes of hyperinflation and its distributional sequels. Had the household surveys started two decades earlier, perhaps perceptions would have been different.

- Overall, the picture that emerges contradicts the notion of constant inequality during the period suggested by the institutionalist approach. According to the evidence presented here, inequality has experienced significant changes since 1900 with important differences across the six countries. It is a moot point whether the inequality impact of both (de)globalisation and industrialisation - plus the response in terms of education and skills formation - would have been different under another institutional setting during the Colonial period (i.e., with more inclusive institutions). This is a counterfactual issue which seems to be difficult to settle.

Regarding “proximate causes”, our analysis of real wages (average, dispersion and the labour share) shows:

- The absence of cases in which sustained rising labour shares and wage compression reinforce each other, generating a sustained fall in secular inequality. What we found was a number of periods of rising inequality in the second half of the last century, characterised by declining labour shares and widening dispersion.

- The prevalence of a pattern of synchronicity (i.e., averages and dispersion moving together), particularly during the later decades. This suggests that skills formation seems to have been a key obstacle to reducing wage dispersion - and inequality - over time in the region. This needs to be investigated further.

- What it is largely missing in our six countries is market-driven episodes of rising average wages together with wage compression. The cases where this occurred (e.g., Argentina around 1940; and Chile around 1950) were short-lived and likely to have been the outcome of government intervention in the labour market. There is no clear evidence of this combination during the early decades dominated by export-led growth, relatively intensive in demands of unskilled labour. Then the potential for rising wages plus compression was likely to have been undermined by immigration, lack of well-functioning labour markets and coercion.

Research agenda (work in progress):
The material included in this paper is part of a wider research agenda. In a forthcoming paper the analysis of the new earnings Ginis is complemented and supported by long-
term series on key fundamentals ("ultimate causes") such as demographic transition, urbanisation, productivity differentials (agriculture vs. manufacturing), skills formation, the terms of trade effects, trade regimes and the real exchange rate. Also, we will discuss in more detailed the role of labour marker regulations and institutions as well as that of political regimes.

Finally, this work opens the door to addressing the fundamental question of whether initial inequality has undermined subsequent economic growth in the region in the longer term (Deininger & Squire, 1997; Barro, 2000). In particular, having a consistent set of earnings inequality series will make it possible to perform regression analysis between initial or past inequality and subsequent economic growth – directly and via capital accumulation – while controlling for key factors such as natural resources and macroeconomic stability.
Annex A: Employment shares and Real Wage Series by Skill Level

Figure A1: employment shares by occupational groups
Figure A2: real wage by skill level and GDP per worker for the LA-6
Annex B: Notes on method and sources
(Some of these notes may need updating)

B1. EAP shares
(To be completed)

B2. Real wages

Argentina

Unskilled rural wages (group 4 of rural labour and domestic servants):
1900-1912: real rural salaries from Cortes-Conde (1979) at prices of 1903. In order to allow for the splicing with the following series, the 1913 figure is assumed to be equal to that of 1912.
1913-1965: average real wage in agriculture from IEERAL (1986). *This series are in australes at 1960 prices and is also available to 1984.*
1965-1980: real wage for the unskilled worker in agriculture (national level) at pesos of 1970 from PREALC.
1992-1995: we could not find specific wage data for agriculture so for these three years we are using the rate of growth of nominal industrial salaries (see below for sources).
1995-2011: nominal monthly earnings in agriculture from *Ministerio del Trabajo* website. See below for the deflator used to calculate real values.

Semi-skilled urban wages (group 3 of urban workers and artisans):
1900-1912: real salaries for unskilled workers (*peones de policía*) from Cortes-Conde (1979) at prices of 1903. In order to allow for the splicing with the following series, the 1913 figure is assumed to be equal to that of 1912.
1913-1965: real average wage (australes at 1960 prices) excluding agriculture and government from IEERAL. *Series are also available to 1984.*
1965-1980: real wages to workers (peones) in the construction sector in pesos of 1970 from PREALC. This source also reports the minimum urban wages for the period. The average ratio of the construction worker to the urban minimum during the year 1965-1974 is 1.6. In order to proxy semi-skilled wages we use an average of the two series using estimates of urban labour informality from PREALC (1982, 1990).
1980-1996: average real wage index (1990=100) from ECLAC.
1996-2011: nominal monthly earnings in commerce, construction, and hotels and restaurants (simple average) from *Ministerio del Trabajo* website. See below for the deflator used to calculate real values.

Skilled labour (group 2 of technicians and administrators):
1900-1970: average monthly industrial salary in pesos at 2004 prices from Ferreres (2005). *This series is also available to 2004.*
1970-1979: real average wage (paid) in manufacturing (national level) at pesos of 1970 from PREALC.
1995-2011: nominal monthly earnings in manufacturing from *Ministerio del Trabajo* website. See below for the deflator used to calculate real values.

Deflators. In those cases when the original wage data are in nominal terms we use a deflator from the following sources:
1900-1980: uses CPI sourced from OxLAD. 1980-2006: uses CPI series sourced from INDEC.
2007-2011: use the implicit GDP deflator to correct for the underreporting in the official CPI inflation figures.

**Brazil**

*Unskilled rural wages:*

1900-1911: growth with series of value added in agriculture per economically active worker. An alternative is to use urban wages in Pernambuco from Williamson dataset, but this series for this period is largely based on interpolations.

1911-1939: in 1911, 1921, 1924 and 1934-1939 uses the average of daily rural wages for “unskilled farm workers” (trabalhador da enxada) in milreis for 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 Anuário Estatístico do Brasil 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 we made estimates based on proportionality with data available for other regions. Also we are not including the data point for Sao Paulo in 1934 because it is an outlier and distorts the media for this year. Figures in 1920, 1922-23 are interpolated. For the years 1913 to 1919 uses the minimum rural daily wage index in the Sao Paulo region from Cardim (1936). The figure for 1912 and 1913 are assumed to be equal to the data point in 1911 in order to allow for the splice with the Cardim series.

There is a data gap between 1924 and 1934. Clearly an interpolation here can be very misleading as it would ignore a very likely turning at the start of the Great Depression. One option is to use Williamson’s salary series for unskilled urban workers, but we did not follow this route for two reasons. First, they are not likely to be a good proxy for the rural wage; and second, such series present some inconsistencies in this period. For instance they show a real increase of 50% between 1924 and 1930 in Rio de Janeiro (with a peak in 1930) but a 35% fall in Pernambuco in the same period (a peak in 1926). Until better information for the period is available we are working with the hypothesis that there is a peak in 1928 and then a decline during the early years of the 1930s – a similar hypothesis is adopted for manufacturing real wages (see below). This pattern is consistent with the behavior of meat consumption per capita in Rio de Janeiro (IBGE) and beer production per capita – largely for internal consumption - for Brazil overall (Mitchell, 2003). We have no data for 1940 so its value is made equal to that in 1939.

1940-1948: uses the rate of growth of minimum real wage series from Camargo (1984). An alternative is to use the series of minimum wages in rural areas for BR5 sourced from IBGE *Evolução do Salário Mínimo Regional - 1940/1984*. But the use of the latter series produces a level of real wage during the earlier decades of the century that are significantly above those of Argentina.

1948-1965: earnings from the unskilled worker in agriculture (remuneração do trabalho agrícola - diarista) from the Instituto de Economia Agrícola (IEA) – available at IPEAdata website.

1966-1978: average monthly real wage in agriculture (cruceiros of 1970), national level, from PREALC.

1978-2011: earnings from the unskilled worker in agriculture from IEA (based on April and November data for the Sao Paulo region).

*Semi-skilled urban wages:*

1900-1937: real wage in Rio de Janeiro (index, 1913=100) from Williamson dataset.


1965-1980: real wages to relatively unskilled workers (peones) in the construction sector in cruzeiros of 1970 from PREALC. Because of lack of data, the years 1965 to 1969 are calculated...
using the rate of growth of the urban minimum monthly real wage (also from PREALC). This source also reports the minimum urban wages for the period. In order to proxy semi-skilled wages we use an average of the two series using estimates of urban labour informality from PREALC (1982, 1990).

1980-2011: real average wage index (1990=100) from ECLAC.

**Skilled labour:**

1900-1913: the series for nominal wages growths in line with the nominal urban wage in Rio de Janeiro from Williamson dataset.
1913-1919: index of minimum rural daily wage in the São Paulo region from Cardim (1936).
1920 and 1928: average wage in industry from industrial censuses on those years. In 1937 we use the average manufacturing monthly salary for Brazil from IBGE Anuário Estatístico do Brasil (AEB). The values for 1921-27, 1929-36, and 1938-41 are interpolated. We assumed that the real wage series peaks in 1928 (data point). Then we use the rate of growth of meat consumption per-capita in Rio de Janeiro (IBGE) to proxy the real wage from 1928 to 1939.

The next data point available for industry is in 1942. In order to link both series we use the rate of growth of the minimum wage between 1940 and 1942 and assumed the value of 1939 equal to that of 1940.

1968-1979: average monthly real wage in manufacturing (cruceiros of 1970), national level, from PREALC.
1979-2010: calculated based on the annual rate of growth of the average nominal wage in manufacturing. São Paulo region. Sourced from Federação e Centro das Indústrias do Estado de São Paulo (available at Ipeadata). This source also offers annual rate of growth of real wages in manufacturing, but its use results in an exponential rise that looks unlikely.

**Deflators.** In those cases when the original wage data are in nominal terms we use a deflator from the following sources:

1900-2000: for the sake of inter-temporal consistency we decided to use the implicit GDP deflator estimated by IBGE as our measure for the country’s internal price index. The same choice was made by Fiorencio & Moreira (1997) in their study of the real exchange rate during the period 1947-1995. During the hyperinflation years of the late 1980s and mid 1990s, we noticed that the use of the “IPC ampliado” (IBGE) results in a discontinuity circa 1989. This problem is not present in the GDP implicit deflator.
2000-2011: uses CPI inflation from IBGE.

**Chile**

**Unskilled rural wages:**

1900-26: Matus (2009, Anexo 9), daily real wage for unskilled worker (**jornal del peon rural real**) at 1913 prices.
1965-80: minimum real wage in agriculture in pesos at 1970 prices from PREALC.
1993-2009: INE nominal wages for unskilled workers
2009-2011: ECLAC real minimum wage.

**Semi-skilled urban wages:**

1900-1930: average real wage for a three industries likely to be dominated by semi-skilled workers (food, drinks and textile) from Matus (2009, Anexo 10).

1965-1980: PREALC only have an index for real monthly wages in the construction sector. In order to estimate level values we apply a 1.25 skill ratio to the minimum urban wage in 1970 (this ratio is in line with the value calculated from Colombian and Mexican data) and then use the index to complete the series back and forth. In order to proxy semi-skilled wages we use an average of the two series using estimates of urban labour informality from PREALC (1982, 1990).

1980-1993: uses an index of monthly earning in the construction sector from INE.

1993-2009: average annual earnings in construction and commerce from INE.

2009-2011: real average wage index (2000=100) from ECLAC.

1900-2002: grows in line with GDP per worker.


1998-2011: overall real minimum wage index (2000=100) from ECLAC.

1900-05: grows in line with GDP per worker.

1905-29: average wage for semi-skilled workers in the public sector from López Uribe (2008). The years 1905-1908 uses the rate of growth of unskilled workers from the same source.

1929-1998: uses series of average daily urban real wages (low skills workers in the construction sector) from Jaramillo et al (2000) for main cities: Barranquilla and Medellín in 1931-1938; and Barranquilla, Bogotá, Cali and Medellín from 1939 onwards. From the same source we take urban minimum wages from 1950 to 1998. To obtain the monthly wages we use a conversion factor of 26 days per month. PREALC dataset only offers an index for wages in the construction sector, so to estimate real wages we use the wage index for the construction sector from INE.

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

Skilled labour:
1900-04: assumed equal to the 1905-07.
1905-10: average daily nominal wage (based on four occupations) in Fábrica Fenicia from Urrutia and Arrubla (1975).
1921-34: Average real wage in industry from Echavarría (1999).
1965-80: average real wage in manufacturing at national level from PREALC.
2000-2011: index of average wages in manufacturing (including coffee processing) from DANE.

Deflators. In those cases when the original wage data are in nominal terms we use a deflator from the following sources:
Uses GRECO after 1905. During the period 1900-1905, inflation estimates are from López Mejía (1990).

Mexico
Unskilled rural wages:
1900-10: daily nominal minimum wage in agriculture from Estadísticas Económicas del Porfiriato.
1921-34: daily nominal minimum wage in agriculture from Estadísticas Económicas de Mexico.
1965-80: minimum daily real wage in agriculture – national level - in pesos of 1970 from PREALC.
1988-2009: average real wage in agriculture (pesos of 2002) from ECLAC.
2009-2011: minimum real wage index (2000=100) from ECLAC.

Semi-skilled urban wages:
1900-10: daily nominal minimum wage for the economy as a whole from Estadísticas Económicas del Porfiriato.
1921-34: real wage series for Mexico from Williamson dataset.
1934-1965: uses the official minimum nominal wage from Wilkie (XXX check Frankema).
1955-1965: average wage in construction sector by ILO.
1965-1977: real average wages of workers in the construction sector in pesos of 1970 from PREALC. This source also reports the minimum urban wage. The average ratio of the construction worker to the urban minimum during the period is 1.4. In order to proxy semi-skilled wages we use an average of the two series using as weights estimates of urban labour informality from PREALC (1982, 1990).
1987-2010: real average wage index (2000=100) from ECLAC.
Minimum urban wage:
1980-2000: uses the official minimum nominal wage from Wilkie (XXXX).
2000-2011: minimum urban real wage index (1990=100) from ECLAC.

Skilled labour:
1900-10: daily nominal minimum wage in industry from Estadísticas Económicas del Porfiriato. We apply a factor 3:1 to estimate an average daily wage in industry.
1921-41: uses the rate of growth on nominal value added per economically active worker in manufacturing from MOxLAD. To splice this series with the pre-1910 values we estimated a figure for the daily nominal minimum wage in 1921 by applying a factor of 1.25 to the data for the daily nominal wage in agriculture in this year. Such factor is the average minimum wage ratio between industry and agriculture during the years 1909 and 1910. As far as we are aware there is no data available on industry wages for this period.


1965-80: average nominal monthly paid wages to blue-collar workers in manufacturing at national level from PREALC.


1996-2004: nominal earnings per month in manufacturing from ILO.

2004-2010: index (2000=100) of average real wages from ECLAC.

Deflators. In those cases when the original wage data are in nominal terms we use a deflator from the following sources:

1900-1913: wholesale price index in Mexico City from ITAM (2004).

During 1915-1917 inflation grows in line with currency devaluation (from Cardenas and Manns, 1987).

1918 onwards: uses OxLAD completed with CPI data from Banco de Mexico.

Venezuela

Unskilled rural wages:

1900-24: grows in line with the monthly real earnings (at 1984 prices) of construction workers from Baptista (1997).

Comment of pre 1920 data. There is scant data on wages for the early decades. There are some observations/recollection of daily salaries for rural (coffee) and urban workers for circa 1900, 1912, and 1922 [McBeth…]. As reported in Valecillos (2007, p.103) the general situation in the labour market in the country during the first two decades was characterized by labour shortages and low and stable wages.

1924-50: for circa 1922, 1936 and 1950 there is information about typical wages in agriculture, manufacturing and the oil industry from McBeth (2012), as well as annual series of average wages in the oil industry for the period 1924-1950 (Valecillos, 1993). We calculate the ratio of agricultural wage relative to the oil wage for the three benchmark years and then use interpolation to complete a series of annual agriculture-oil wage ratios. Then those ratios are applied to the oil wage series to obtain an annual series of wages in agriculture.


1975-78: monthly rural real wage in bolívares of 1970 from PREALC.


1990-2011: overall real minimum wage index (2000=100) from ECLAC.

Semi-skilled urban wages:


1965-69: we work with two monthly real wage series (at bolívares of 1970) for workers in the construction sector and the minimum urban wage and from PREALC. The latter is only available for 1974 to 1980 and is projected backwards with the series for the average construction wages from Baptista. The average ratio of these two series is about 4, which indicates that the average series is dominated by relatively skilled workers. In order to calculate a proxy for semi-skilled urban wages we use the average of the two series using as weights estimates of urban labour informality from PREALC (1982, 1990).


1988-2011: average real wage index (1990=100) from ECLAC.
**Skilled labour:**

1900-22: grows in line with the monthly real earnings (at 1984 prices) of semi-skilled workers (e.g., mechanics and accountants) in the public sector from Carrillo Batalla (2002, 2003) – this data is available every five years from 1900 to 1935.

1922-61: for circa 1922, 1936 and 1950 there is information about typical wages in manufacturing and the oil industry from McBeth (2012), as well as annual series of average wages in the oil industry for the period 1924 to 1950. We calculate the wage ratio manufacturing to oil for the three benchmark years and then use interpolation to complete the manufacturing-oil annual wage ratios. Such ratios are then applied to the oil wage series to obtain an annual series of wages in manufacturing.


1965-79: monthly real wage in manufacturing in bolívares of 1970 from PREALC.

1979-90: nominal annual earnings per worker in manufacturing as reported in OCEI industrial surveys (taken from Valecillos, 1993).

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

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

**Deflators.** In those cases when the original wage data are in nominal terms we use a deflator from the following sources:

1900-1944: general price index from De Corso (2013). After1945 uses CPI from the BCV.
References (to be completed)


López, J.H. and G. Perry, 2008. Inequality in Latin America: determinants and Maloney, 2002 argument in Missed Opportunities...

References for wage data (to be completed)
Cardim, Mario. (1936): Ensaio de analyse de factores economia e finanças do Estado de S. Paulo e do Brasil (apêndice estatístico). Secreta de Agricul. Industria e Comercio, Estado de S. Paulo.
Dirección Nacional de Planeación (DNP). Estadísticas Históricas de Colombia.