Inequality, Living Standards and Growth: Two Centuries of Economic Development in Mexico

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Abstract

We present a new dataset on real wages in Mexico from 1800 to 2015 and analyse the implied relationship between inequality, livings standards and growth. Wages failed to keep up with per worker GDP in most periods, and in the twenty-first century per worker GDP is over eight times higher than in the nineteenth century while unskilled urban real wages rose only 2.2 times and median wages only 2.0 times. Mexico's experience is consistent with the Lewis dual economy model, but not with Kuznets's model of inequality and growth. We show that the key difference between the two models concerns their assumptions regarding labour mobility between sectors. The only period of reduced inequality was the mid-twentieth century, which is explained by a combination of institutional and political factors in a context of rapid industrialization. Our findings confirm that there is no automatic positive relationship between economic growth and rising living standards for the majority.

1. Introduction

It is a truth universally acknowledged that the consequences for human welfare of different rates of economic growth are staggering.[1] Less widely acknowledged, but equally true, is that human welfare depends primarily on the growth rates of incomes of individuals, not of countries. For this reason, the study of economic development without reference to the distribution of income growth across individuals is at best partial, and at worst misleading.

Several studies have established that economic growth within countries has not on average favoured one part of the income distribution over another (e.g. Ravallion and Chen 1997, Ravallion 2001 and Dollar and Kraay 2002).[2] But these studies all use data that are in many cases not comparable (Atkinson and Brandolini 2001), motivating more detailed country studies that emphasise data consistency. They are also based on short-term movements, not long-term trends. Moreover, individual cases may diverge substantially from the average, and to the extent that we believe that economic theory can explain the processes that connect growth and income distribution, we should strive to explain these cases. As Ahluwalia (1976, p. 307) noted, "such processes should be examined in an explicitly historical context for particular countries." Alvaredo et al. (2013) have shown that rich countries experienced widely differing long-term trajectories for inequality despite their similar technological and productivity developments. For developing countries the processes will be different again. In this spirit, the purpose of this paper is to present new consistent data documenting living standards and inequality in Mexico from 1800 to the present, and to explain their evolution.

Our analysis is based on a new long-run data series on the wages of construction workers in Mexico City for 1800 to 2015, supplemented by more sparse new estimates of median wages. Since differences in data definitions can lead to misleading results, we document the primary sources of the data to ensure comparability over time and give comparisons with other available sources. In order to estimate living standards, we also construct a price index for a subsistence basket, again based on primary data. Following

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[1] Lucas (1988: p. 5): "The consequences for human welfare involved in questions like these [the causes of different GDP growth rates] are simply staggering: Once one starts to think about them, it is hard to think about anything else."

[2] Still, a preference for poverty reduction or, more generally, a concave social welfare function, will imply a preference for growth that *reduces* inequality – so the finding that growth benefits the poor proportionately does not imply that inequality becomes unimportant. As Ravallion (2005) notes, it remains true that "inequality is bad for the poor"; as Segal (2011, p. 486) puts it, "inequality represents a wasted opportunity for poverty reduction".

Williamson (1997), we measure inequality using the ratio of per worker GDP to wages.[3] While this measure has its limitations, we argue that when applied to Mexico it is an appropriate indicator of inequality. The ratio is increasing in the share of national income accruing to the upper portions of the income distribution, as opposed to the majority. This means that the higher this ratio, the lower is the contribution of GDP to social welfare – which has traditionally been a primary motivation for studying inequality (Atkinson 1970).[4]

Our focus is therefore neither the very rich, as in the recent literature on top incomes,[5] nor the very poor, as in studies of poverty. Piketty (2014, p. 266) notes that, "The social reality and economic and political significance of inequality are very different at different levels of the distribution, and it is important to analyse these separately." By analysing low-skilled wages, we place the focus on what inequality implies for this representative group. Like Tawney (1913, p.7) writing over a century ago on British workers, "what we want to study is not what has brought about the downfall of a small number of people; what we want to investigate are the causes which leave a vast proportion of the population in a condition in which they are liable at every change, under every shock of accident, to fall into this condition of misery."

In addition to being a source of income, wages are a payment to a factor of production. Their evolution relative to per capita or per worker GDP therefore also tells us about economic structure and the process of development. Kuznets's (1955) dualist model is the standard reference for the evolution of inequality during development. But we show that Lewis (1954), also a dualist model of development, provides a contrasting vision. The key difference is that Kuznets assumes that the fruits of capitalist development are shared with capitalist workers even in the early stages of development, while in the Lewis model these benefits accrue only to the capitalists, with wages in the capitalist sector remaining low. We

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[3] While Williamson uses real GDP and real wages based on the GDP deflator and CPI respectively, we use nominal GDP and nominal wages in order not to mix deflators. We do this in order to be consistent with the standard approach in studies of inequality, where incomes at different points of the distribution are compared in nominal terms.

[4] Assuming standard distributions. Atkinson's (1970) 'equally distributed equivalent' income allows one to measure how much income is being wasted in terms of social welfare and is increasing in the degree of inequality. We note that y/w will also rise if incomes of those *below* the median wage rise disproportionately, i.e. with a decline in inequality between median wage earners and those poorer than them. But since the incomes of those below the median are necessarily a small share of GDP, the magnitudes of changes in y/w that we observe in Mexico can only be explained by rising income shares above the median, i.e. rising inequality.

[5] See the World Wealth and Income Database [http://wid.world/] for available top income data and a full list of literature and sources. Atkinson and Harrison (1978) also focused on the top 10%, and more specifically the top 1%, of the wealth distribution.

demonstrate that this means that in the Lewis model inequality rises indefinitely with economic growth, remaining close to Milanovic's (2006) 'inequality frontier'.

In this sense the Kuznets model provides an optimistic vision of development, while the Lewis model is more pessimistic.[6] Indeed, Lewis (1954) stated that "The central fact of economic development is that the distribution of incomes is altered in favour of the saving class." The underlying question becomes whether economic development automatically leads to rising living standards for all, with inequality kept in check, or whether it is consistent with stagnating living standards for a majority and increasing concentration of income. In the economic history literature the optimistic view is expressed by Clark (2009, p 2-3), who argued that, in today's rich countries, productivity trends have implied that "The biggest beneficiary of the Industrial Revolution has so far been the unskilled." In contrast, Piketty (2014) argues that the dynamics of capitalism only increase inequality over time, and that it took a combination of crises and political interventions to cause the widespread decline in inequality of the mid-twentieth century.

Our data indicate that in Mexico real wages little more than doubled from the nineteenth century to the twenty-first century, while real per worker GDP rose 8.5 times. We argue that this can be explained by the Lewis model but is inconsistent with the Kuznets model, and provide further evidence to support Lewis over Kuznets in the Mexican case. Since most of the benefits of growth must therefore have accrued to the upper parts of the income distribution, this implies a large rise in inequality. Thus Mexico supports the pessimists' view of long-run trends in inequality. In contrast to the short-run average effect found by Dollar and Kraay (2002), long-run growth in Mexico did remarkably little to help the poor.

On the other hand, we also find a substantial rise in wages in the mid-twentieth century, which is reversed around 1980. This finding contradicts existing assumptions about inequality under state-led development in Mexico, and we show that the prevailing view is based on widely-cited but inconsistent data. We explain this temporary divergence from the predictions of the Lewis model by a combination of economics, institutional and political developments.

The next section discusses the theoretical and empirical literature on long-run inequality, with a focus on Latin America, and explains our approach to inequality. Section

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[6] Lewis did not expect his model to apply in the long run, so he could personally be described as an optimist, but the model itself has pessimistic implications.

three describes our data. Section four presents our results and provides a narrative of development in Mexico to place them in context, and to explain short-run variations in living standards and inequality. Section five analyses the Kuznets and Lewis models and explains why Mexico's long-run experience is better described by the latter.

2. The study of historical inequality

This historical approach to the study of inequality follows the tradition of Kuznets's (1955), Atkinson and Harrison (1978) and Piketty (2014).[7] Kuznets (1955) famously postulated that inequality would follow an inverse-U shape over time, driven by economic, political and demographic factors. He argued that the rise in inequality would be due to both the tendency of the rich to save a higher share of their incomes, and to the early stages of industrialization when the modern sector comprised a small but growing share of the economy. The subsequent decline in inequality, he suggested, would be due both to the spread of the modern sector throughout the economy, and to political reactions against rising inequality of wealth.

The tendency of the rich to reproduce their wealth through high savings rates was analysed by Atkinson and Harrison (1978) through their concept of the 'internal' rate of accumulation. Piketty's (2014) analysis of the evolution of wealth inequality in Europe utilizes his version of this concept, which he describes as a "fundamental law of capitalism".[8] Following Kuznets and Atkinson and Harrison, his explanation of inequality trends depends on both economic and non-economic mechanisms. He shows that while the accumulation of capital follows an economic logic, the Great Depression and the World Wars dealt a great blow to accumulated wealth, while political and institutional choices restrained the recovery of private wealth and sustained low income inequality for several decades after 1945. A drawing back of inequality-reducing policies and social norms, combined with the laws of capitalist accumulation, explain the rapid rise in both wealth and income inequality in recent decades in the English-speaking countries.

Both Atkinson and Harrison, and Piketty, focus on rich countries. For Latin America, the literature on historical inequality has often been motivated by its current high levels of inequality. Engerman and Sokoloff (1997) argued that this high inequality is rooted in

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[7] Also see Piketty (2003, 2011), Piketty and Saez (2003), Banerjee and Piketty (2005), Piketty, Postel-Vinay and Rosenthal (2006), and Atkinson and Piketty (2007, 2010).

[8] However, Piketty simplifies the theoretical analysis, setting aside the role of the savings rate that is highlighted by Atkinson and Harrison.

extractive economic institutions and power structures dating from the early colonial period. Following this approach, Acemoglu and Robinson (2012) further developed the view that economic growth depends in large part on the inclusiveness of political institutions. Reygadas (2010) highlighted cultural and social mechanisms that reproduce inequality over time. These theories purport to explain the persistence of inequality but provide little empirical evidence of its change over time.

Other scholars have emphasized change and transformation. Williamson (2010) estimated Gini coefficients in Latin America over five centuries based on social tables and GDP-to-wage ratios, finding that inequality was not high by contemporary global standards up to the nineteenth century. Instead, he argues that high levels of inequality in Latin America in the twentieth century were a result of a surge in the *belle époque* (roughly 1880-1914) due to the forces of globalization. Coatsworth (2008) presents a similar historical trajectory of Latin American inequality, although in his interpretation shifts in power among the elites and popular sectors were fuelled by cycles of economic growth. These claims are consistent with our finding of much higher inequality in the twentieth century than the nineteenth.

Three papers present long run series of inequality in Mexico through the twentieth century, all in the context of multi-country studies. Frankema (2010) estimates the labour share of income in Mexico over 1900-2000. Similarly to our series, he finds the labour share falls to its lowest level at the end of the twentieth century. Prados de la Escosura (2007) estimates Gini coefficients for Mexico from 1913 to 1990, using published Ginis from 1950 and projecting backwards using Williamson's ratio of per worker GDP to wages. He finds that inequality peaked in 1960, in contrast to our and Frankema's finding of relatively low inequality in the mid-twentieth century. Similarly, Arroyo Abad and Astorga (2017) estimate the between-group Gini coefficient for three types of workers and the group "employers, managers and professional" from 1820 to 2000. Their findings are consistent with ours from around 1960, but they find a large peak in inequality in 1950, higher than in 2000, which again contrasts with our results.[9] In the case of Prados de la Escosura, the finding of high inequality in the mid-twentieth century is based on widely-cited household surveys, and we

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[9] Before 1920 they estimate inequality between different wage earners only, leaving out all property income, so their estimates are not comparable with our GDP-based estimates. The only major difference between their inequality series and ours in this period is that they find no rise in inequality around 1900, where we do. This can be explained by the fact that the economic growth of the period was capital intensive (see our discussion in section 4 below), so their measure will miss the corresponding rise in incomes of capitalists that is captured by GDP and hence the Williamson ratio.

show in Appendix 1 that these surveys are not comparable over time. Arroyo Abad and Astorga's result, on the other hand, appears to be driven by an outlier for the income of the richest group in 1950, which more than doubles relative to other groups compared with their estimates for 1940 or 1960.[10] These authors use a variety of international sources, but do not specify their original national source or report them by year so we cannot assess their consistency.[11] Frankema also uses a mix of sources including both national and international. Relative to these studies, our consistent use of wages of construction workers in Mexico City implies that we have a less fine-grained breakdown of the income distribution, but it has the advantage of maximizing comparability over time, which we ensure by documenting the primary sources of the data (see the next section and Appendix 2). Our estimates of national median wages have additional normative significance, discussed below, at the expense of more dependence on assumptions and less consistent primary sources.

Our approach is thus also based on a literature in economic history that has estimated real wages over long periods. Robert Allen's studies of real wages in Europe, Asia and the Americas over the very long term opened new paths in the field (Allen 2001; Allen, Murphy and Schneider 2015). Allen established a simple methodology that allows long-term comparisons, estimating annual income from daily wages of unskilled construction workers. The cost of living is calculated with a Laspeyres price index based on a basic subsistence basket.[12] Challú and Gómez-Galvarriato (2015) followed Allen's (2001) method to produce a series of real wages in Mexico from 1730 to 1930. They found cycles of real wage gains and losses with no apparent long run trend.

As we describe below, our data series builds on Challú and Gómez-Galvarriato, estimating real wages from 1800 to 2015. In order to connect them with the process of economic development and to test the Kuznets and Lewis models we compare this series with per worker GDP. This implies that we are also concerned about inequality: the question is not just living standards, but also how they grew relative to aggregate income. For this reason we

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[10] The authors refer to Astorga (2015), where the outlier can be seen in Annex B, Table B-2.
[11] The authors, and Astorga (2015), do not give exact sources for the 1950 wage data, referring to a mix of sources from the international organizations ILO, ECLAC and PREALC.
[12] The method has been criticized for its use of simplified consumer baskets as well as assumptions on the size of households and number of days worked in a year (Dobado 2015; Humphries and Weisdorf, 2016). Still, the assumptions hold well against the evidence existing for the case of Mexico and Latin America (Allen, Murphy and Schneider, 2015; Challú and Gómez-Galvarriato, 2015).

follow Williamson (1997) in using the ratio of per worker GDP to wages as a measure of inequality, denoted y/w.[13]

The Williamson measure applied to urban construction workers is an appropriate variable for testing models of industrialization and development because these are unskilled workers in the capitalist sector, using any available physical capital but little human capital. They are the wages that appear in the Lewis and Kuznets models. But it may be less effective as a *normative* measure of inequality, because we do not know a priori where in the overall distribution the unskilled urban labourer is located, or whether the location changes over time. On the other hand, the Williamson measure applied to *median* wages is a plausible normative inequality measure: it is consistent with the view of the Stiglitz Commission that "median consumption (income, wealth) provides a better measure of what is happening to the 'typical' individual or household than average consumption (income or wealth)" (Stiglitz et al, 2009, pp. 13-14).[14] Thus the Williamson measure applied to median wages tells us the extent to which total income is benefitting the typical worker.

Prados de la Escosura (2008, pp. 291-2) finds in the case of Spain that the typical unskilled urban worker moves down the distribution over time, implying that the Williamson measure using those wages overstates the rise in inequality: in Spain, y/w using unskilled wages rises dramatically after 1950, but y/w using the average of all wages does not. In this case unskilled wages stop being representative of the middle of the distribution and therefore give a misleading picture of inequality.[15] We check if this is the case in Mexico by estimating historical median wages for years in which we have plausible data, which are 1800, 1827, 1845, 1905, 1929 and 1950. Since 2005 we have high quality nationally-representative wage data. As we discuss in more detail below, over the whole period 1800 to 2015 the unskilled urban wage is consistently above the median wage by between 20 and 53 percent, with no time trend. Thus, unlike in Spain, the urban construction worker did not move substantially down the distribution over the long run, implying that the y/w series in Mexico does not suffer the bias it suffers in Spain. As we describe below, however, estimates of the median

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[13] While Williamson uses real GDP and real wages based on the GDP deflator and CPI respectively, we use nominal GDP and nominal wages in order not to mix deflators. Our method is consistent with the standard approach in studies of inequality, where incomes at different points of the distribution are compared in nominal terms.

[14] Cowell and Flachaire (2017) go so far as to suggest the following new axiom for inequality measures: that any move of an individual away from the median should imply an increase in inequality.

[15] On the other hand, as Prados de la Escosura acknowledges, average wages ignore inequality among wage earners, so if inequality rises then y/w using average wages will understate the rise. This is one reason to prefer median wages to average wages, as rises in average wages may reflect rising wage for high-skilled workers and not for the majority.

are less reliable, depending on less comparable data and more assumptions than our construction workers' series. In sum, we see the two series as complementary: the construction workers' wages are appropriate for the analysis of industrialization and economic development, and more consistently and reliably estimated, while the median is more suitable as a normative measure.

3. Data

Our empirical analysis is based on a new dataset covering 1800-2015. Our primary data comprise three series: construction wages, prices and per worker GDP. In addition we estimate median wages in 1800, 1827, 1845, 1905, 1929, 1950, and 2005-2015. Our long-run wage series is of construction workers in Mexico City and its environs, prices are based on a basket of consumer goods for Mexico City, and GDP estimates are national. As measures of inequality we use per worker GDP over construction wages, denoted y/w, and per worker GDP over median wages, denoted y/w_m.[16] As discussed above, y/w is appropriate for testing the Lewis and Kuznets models, while y/w_m is more appropriate as a normative inequality measure. Appendix 1 discusses the implications of alternative GDP data and wage data sources. Detailed sources and methodology are described in Appendix 2.

The construction wage series is composed of three distinct datasets, each covering different periods but all using data for construction workers in Mexico City and its environs. This maximizes comparability over time. From 1800 to 1930, the data are based on Challú and Gómez-Galvarriato (2015), who compiled daily wage rates from the payrolls of construction sites in public institutions. From 1939 to 1975 the data were obtained from Bortz (1987), who reported weekly wages and hourly rates based on surveys of construction companies. These are extended to 1985 using growth rates for industrial wages more broadly, taken from industrial surveys. Finally, we calculate new wage estimates for 1987 to 2015 from the household employment and occupation surveys ENEU (for 1987-2004) and ENOE (for 2005-2015). We also report estimates from the income and consumption survey ENIGH,

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[16] Due to a lack of reliable data on the economically active population we use the number of people aged 15-64 as a proxy. This means that y is underestimated, implying that the *level* of inequality y/w will also be. Regarding changes over time, apparently-consistent estimates of the working population in Estadísticas Historicas de México over 1921 to 1960 vary from 0.53 to 0.62 of the working-age population (with no trend), implying variation of up to 17 percent. This could be interpreted as a margin of error for estimated changes over time.

which is the standard source for estimates of inequality in Mexico from 1984 to the present.[17] We use ENEU and ENOE as our primary series because their sample of construction workers in Mexico City and Mexico State is much larger than that of ENIGH, averaging 810 per year (203 per quarter) compared with 86 per year in ENIGH.[18] See Appendix 1 for a comparison of alternative data sources. Among our three sub-periods, we judge the series for 1800-1930 to be highly comparable with the series for 1987-2015, as both measure the wages of low-skill construction workers. The series for the mid-twentieth century is an average that includes higher-skill construction workers, and may under-represent smaller informal firms, both of which may imply an upward bias relative to the other series. Comparison with census data in 1950 and 1960 for the city suggest this bias may be as high as ten percent (see Appendix 1).

Turning to median wages, for 2005-2015 we use ENOE, the source we use for construction wages.[19] Our pre-21st century estimates rely on social tables reporting the economically active population in different occupational groups, as well as observed or estimated levels of income by each group. We select years in which we have enough information to discriminate within the rural and urban sectors, which is a major determinant of the income distribution in Mexico. Rather than making assumptions about the evolution of pre-established skill groups (as in Arroyo-Abad and Astorga 2017 and Astorga 2015), we rely on the classifications provided by historical sources. The different categories are linked to reports on wages for the whole country or at least the most populated regions. Whenever income information is not available we use known income ratios from other periods or subsets of data. The emphasis is on reconstructing the income around the median; for this reason, our tables are not suitable for calculating Gini coefficients of the whole distribution of income. While our approach does not provide a homogeneous set of classes and their stylized trajectories, it has the advantage that it uses classifications that were deemed representative of income differentials by their contemporaries. The fact that our estimates keep a relatively consistent proportion to construction wages (with the exception of 1950, discussed below) supports the robustness of the approach. The ratio of the unskilled urban wage to the median wage is consistently between 1.20 and 1.53 over the whole period, with no time trend.

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[17] It is used by the Luxembourg Income Study, the Mexican government, and academic papers such as Esquivel, Lustig and Scott (2010) and Esquivel (2011).
[18] ENIGH has fewer than 60 construction workers in the five years 1987, 1998, 2000, 2012, 2014.
[19] ENEU, covering 1987-2004, is for urban areas only so we cannot use it to construct a national median wage.

We estimate living standards by dividing the relevant wage by the cost of a basic household consumption basket for 3.15 equivalent adults, the contents of which we keep constant over the whole period. For the post-1930 period we produced a new series for the price of this consumption basket that is distinct from existing price indexes and is comparable to the pre-1930 *respectable* basket used in Challú and Gómez-Galvarriato (2015). In order to make our baskets comparable, we set the calorie content over the whole period equal to that in Mexico's present-day poverty basket, which represents a contemporary judgement on what counts as a subsistence level of consumption.

We do not presume that this measure of living standards fully reflects well-being. First, it does not fully capture consumption of goods and services. The modern surveys confirm that for households with a construction worker, this worker's wage is typically the primary source of income, comprising on average 58% of total household income. We do not attempt to measure the remaining 42%, nor to divide household income by equivalent adults, as would be required by a full welfare analysis. It also excludes benefits in kind that are provided by the government. Scott (2013) estimates that in 2010 the fifth and sixth deciles of the income distribution received public services worth respectively 17.5 and 21.1 percent of market income. Assuming that these were lower in the mid-twentieth century and close to zero in the nineteenth century, this would imply some rise in living standards not accounted for by real wages. Moreover, health outcomes and quality of life have improved dramatically over the last two centuries, as demonstrated by substantial increases in life expectancy and heights since the 1930s.[20] However, the extent to which individuals are healthier over and above their higher real wages is primarily due to public health measures, such as improved sanitation and drinking water, and improved individual health behaviours.[21] This means that the real wage remains a good measure of the extent to which capitalist development through the market economy has contributed to improved well-being.

4. Results: A history of inequality and living standards in Mexico

Figures 1 and 2 provide our main empirical findings from 1800 to 2015, while figure 3 plots real per worker GDP for comparison. Figure 1 shows inequality defined as the ratio of per worker GDP to wages, *y/w*, while figure 2 shows real wages defined as the ratio of the wage to a household consumption basket. We focus on our series of unskilled urban wages,

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[20] López-Alonso and Vélez-Grajales (2017). Campos-Vazquez et al (2017) also find that literacy rates, school enrolment rates, and the number of physicians per head of population rise throughout 1895-2010.
[21] See Deaton (2006) for discussion of the causes of improved health over time.

which is measured more accurately than the sparse estimates of national median wages. In brief, inequality was low in the nineteenth century and first rose substantially around 1900. It then fell again in the mid-twentieth century, only to rise to new heights at the end of the twentieth century – tracing a pattern not dissimilar to that of the Anglo Saxon countries in the twentieth century.[22] Inequality was highest around 2000, but in 2015 remained close to that peak and higher than any year prior to 1990. In turn, real wages were volatile (owing to volatile prices) but trendless from 1800 to 1930, experienced a temporary spike around 1940, and then a sustained rise from the mid-1940s to the late 1970s. They collapsed in the 1980s and then oscillated around a level higher than the nineteenth century but below the levels of the 1960s and 1970s. We now describe these trends in more detail and provide a historical narrative exploring their proximate causes. In the next section we turn to a theoretical explanation of the underlying mechanisms.

Mexico achieved independence from Spain in 1821, after heightened social tensions and widespread rural rebellion in the 1810s.[23] In the five decades following independence Mexico experienced political instability driven by conflict between Liberals and Conservatives, and foreign military interventions. Bearing in mind that GDP data in the nineteenth century are sparse and unreliable, figure 1 shows that inequality on our measure y/w was lower in the mid-century than just prior to independence, falling from 0.74 in 1800 to 0.58 in 1845. However, as indicated in figure 3, this was due to a decline in per worker GDP rather than any rise in wages, which were no higher in real terms (Figure 2). This is consistent with Tutino (1986) and Chowning (1999), who emphasize the destruction of capital during the insurrection in the 1810s; moreover, increased leverage of peasant communities may have curbed the reconstruction of elite power. Anthropometric data show that a decline in heights stopped after 1820, and heights increased in the third quarter of the century (Challú, 2010; López-Alonso 2012). The moderate improvements in y/w and heights, however, suggest that the reduction of inequality after independence was more modest than is sometimes portrayed (Arroyo-Abad 2013; Tutino, 1986). Furthermore, real wages show no trend (Figure 2).

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[22] Alvaredo et al. (2013).
[23] The rising degree of inequality under these circumstances was the subject of studies by Challú (2010) and Van Young (1992).

*Figure 1: Inequality in the long run, y/w, 1800-2015*
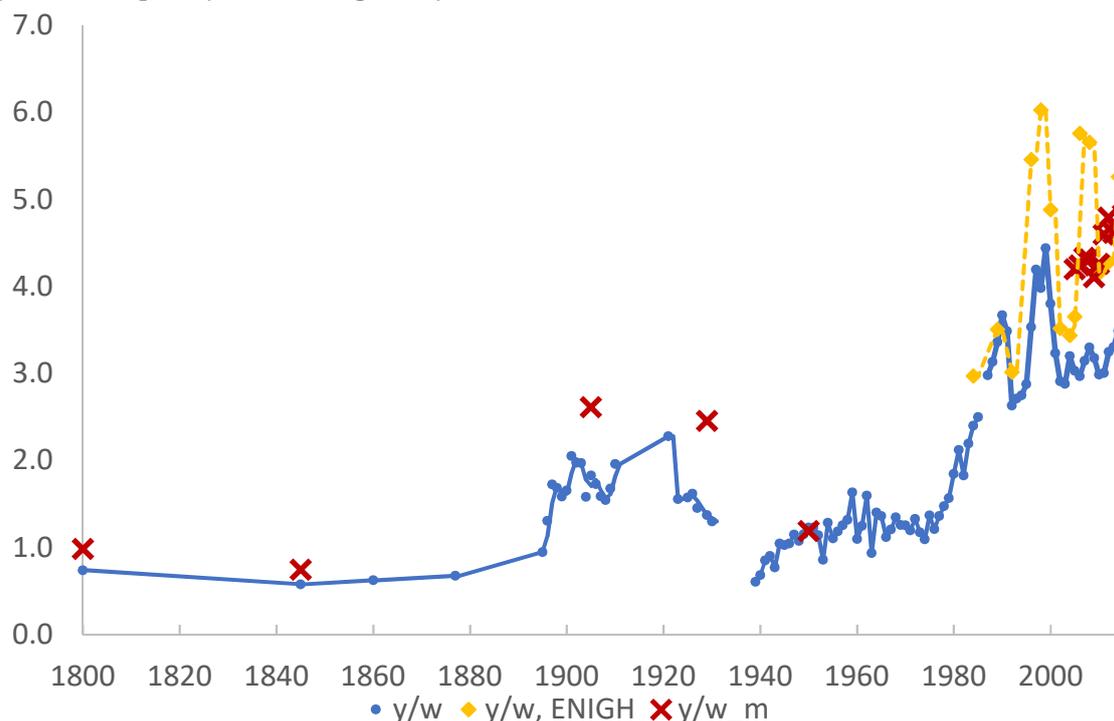
Sources: see Appendix 2. Note: *y* is nominal GDP per worker. *w* is nominal unskilled urban wages. *w_m* is nominal national median wages. Line breaks show changes in wage series. ENIGH is an alternative source to that used in our main series: see text for discussion.

Figure 2: Living standards in Mexico: Welfare ratios, 1800-2015
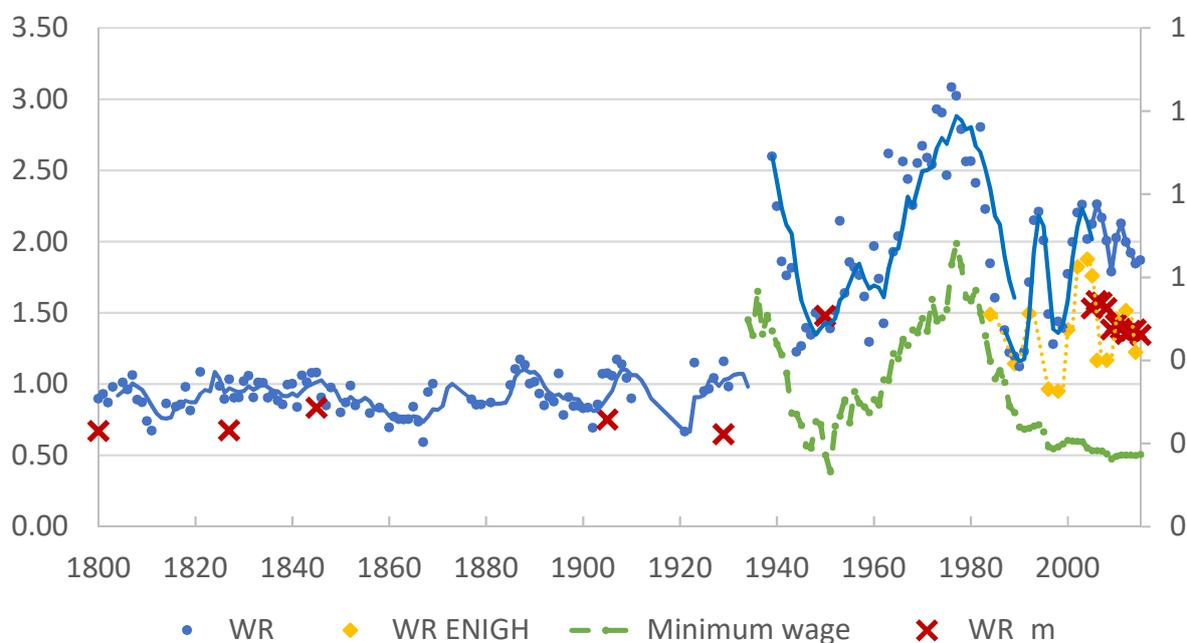
Sources: See Appendix 2. Notes: WR is the welfare ratio for urban unskilled wages, i.e. the wage divided by the price of a consumption basket for 3.15 people. WR_m is the welfare ratio of the national median wage. Line breaks show changes in wage series. Lines are moving averages.

Figure 3: Real GDP per worker, log levels and growth rates, 1800-2015
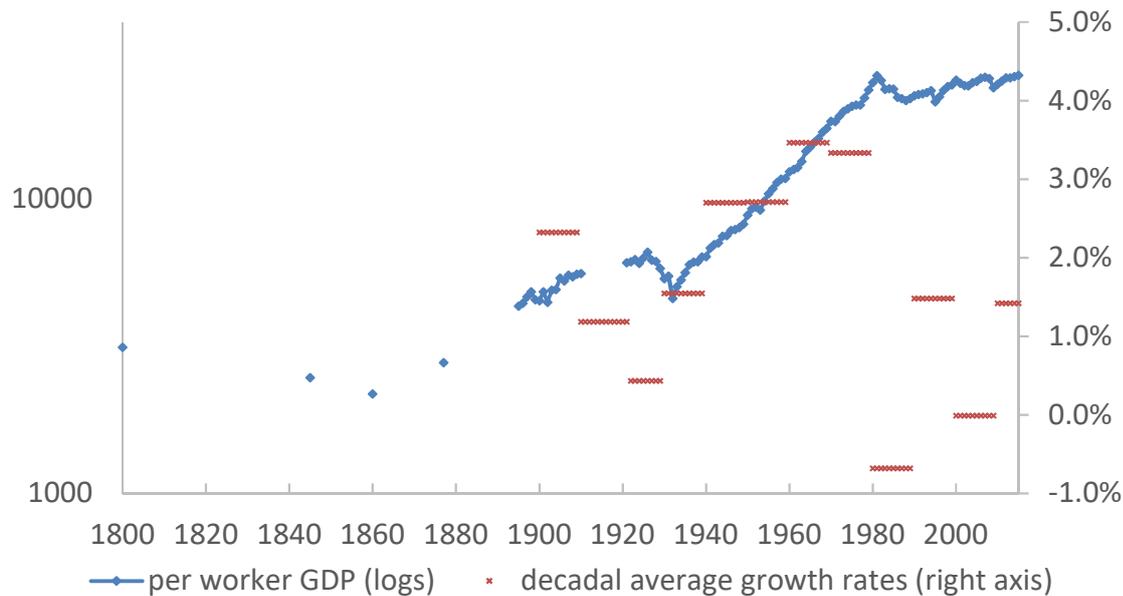
Source: EHM table 7.1 up to 1970, in constant 1970 prices, extended using growth rates from WDI. Note: Data are more controversial before 1900: see Appendix 2. Decade average growth starts from 1900.

The last successful Liberal uprising brought General Porfirio Díaz to the presidency in 1876, and the first major change in inequality occurred during the period known as the Porfiriato, from 1876 to 1910. Real per worker GDP doubled (Figure 3), fuelled by abundant international lending and flourishing foreign direct investment, mostly but not exclusively in railroads and mining. Export-led economic growth during this period of globalization helped maintain political stability among elites.[24] During the Porfiriato many peasants were displaced from their lands, lost autonomy and turned to wage labour. At the same time, the economy diversified as cities grew and modern industry blossomed.[25] Figure 2 indicates that wages were somewhat volatile, but with no trend: the average welfare ratio over 1901-1910 was virtually identical to the average of 1830-1850 and just below one. The dramatic rise in per worker GDP therefore translated into a dramatic rise in inequality: rapid economic growth had little effect on real wages, perhaps in part owing to regular repression of workers and peasants. The ratio *y/w* averaged 1.79 over 1901-1910, compared to 0.66 prior to 1880.

Real wages dropped precipitously during the so-called Mexican revolution, a period of civil war and unrest between 1910 and 1920, but without reliable GDP data for this period

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[24] See O'Rourke and Williamson (2002) for a discussion of the globalization of the late nineteenth century.
[25] For economic histories that also find evidence of increasing inequality in the Porfirian period see Gómez-Galvarriato (2013), Haber (1989) and López-Alonso (2012).

we do not know to what extent the decline in incomes was shared throughout the economy. Population estimates suggest that by 1921 deaths due (directly or indirectly) to the revolution and the 1918 influenza pandemic reduced the population by about 2 million people, compared with what it would have been had population growth sustained its 1901-1909 level.[26] But there is no sign that this raised wages. By 1921 inequality measured by *y/w* was higher than ever before at 2.28, but in 1923 dropped back down to 1.56. Womack (1986) argued that the revolution did not transform the structure of the economy or of business, and that the most productive industries remained largely unscathed (even protected) from the armed conflict, perhaps explaining the initial high levels of *y/w* at the end of the revolution.

Inequality, however, declined in the 1920s. The decline was driven by a combination of the recovery of real wages and stagnating real per worker GDP, as the country suffered continuing political turmoil including the Cristero Rebellion of 1926-29 and the threat of intervention by the United States. Rising wages may be explained in part by institutional changes spurred by the mobilization of the labour movement in this period (Bortz 2002, Gómez Galvarriato 2002). A general strike in 1916 was suppressed, but labour activism was on the rise and two major labour organizations, the Confederación Regional Obrera Mexicana (CROM) and the more militant Confederación General de Trabajadores (CGT) were formed, respectively in May 1918 and in February 1921. The CROM's political arm, the Partido Laborista Mexicano (PLM), received the governorship of the Federal District in 1920, and in 1924 the PLM held the majority of seats in Mexico City's council. Still, the Porfirian rise in inequality was only partially reversed, with *y/w* declining to 1.30 in 1930.

The Mexican economy was already shrinking when the Great Depression started to spread across the world, and per worker GDP in 1932 was 30% below its previous peak in 1926. In response to the international economic crisis the government implemented currency controls, differential exchange rates, and specific tariffs to support domestic businessmen and protect the balance of payments. Government support for production did not stop there. Infrastructure investment by the federal government increased, and in 1933 the public financing agency Nacional Financiera was created to help struggling banks and to channel funds into commercial agriculture and real-estate development. Growth resumed under these improvised policies of import substitution and government support for capitalist accumulation. Per worker GDP grew 39% over 1932 to 1940, but did not exceed its mid-

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[26] Based on data in figure 7 below. The annual population growth rate was 1.1% over 1901-09, lower than before 1900 or after 1920, suggesting the 2 million is a conservative estimate.

1920s peak until 1942. At the same time, the Cárdenas administration (1934-40), under pressure from the labour and agrarian movements, deepened land reforms and pushed for pro-labour resolutions to conflicts over wages and working conditions.

We do not have actual wage data for 1931-1938, but we have minimum wage data from 1934 (figure 2). The wage series from 1939 is based on industrial surveys, and shows a dramatic spike in construction wages. The change in source from 1939 might make one question the size of this jump: as we noted above the wage average includes higher-skill construction workers, unlike the pre-1930 and post-1987 series. On the other hand, a substantial rise in wages in the late 1930s is supported by several independent studies cited by Bortz and Aguila (2006: p. 121), including a report of the General Motors Company for Mexico from 1942 that claimed that real wages and benefits rose 44 percent in dollar terms between 1935 and 1940. Still, measured construction wages rapidly fell back to previous levels by 1944, owing to high inflation in the first half of the 1940s.

From the late 1940s wages started their most consistent rise in Mexican history. Data on heights support the finding that living standards rose, as those born in the 1930s and 1940s were taller than their predecessors (López-Alonso, 2007). From the Second World War to the 1970s was a period of state-led development, rapid industrialization, and the historically-highest rate of growth in Mexico; for these reasons it is known as Mexico's 'miracle' period. Protected and subsidized by the government, industry's share of employment rose from 12.7% in 1940 to 23.0% in 1970,[27] while per worker GDP grew at an average rate of 2.8% through the 1970s.

Unlike during the Porfiriato, however, real wages shared in this growth, reaching their highest level ever. The welfare ratio averaged 2.15 in the 1960s and 2.76 in the 1970s. This produced the lowest inequality of the twentieth century: y/w averaged 1.17 over 1940-75, compared with the 1.79 of 1901-1910. In addition to rising real wages in Mexico City, the reduced inequality seems to have extended to rural areas: we do not have data on rural wages in this period, but data on land holdings suggest that land reforms in the 1930s reduced rural inequality. We find that the Gini coefficient for private and communal land holdings declined from 0.93 in 1930 to 0.82 in 1960, while the Gini for private land holdings fell from a peak of 0.96 in 1940 to 0.90 in 1970. Also supporting reduced rural inequality, the economic yield of small ejido plots (less than 5 hectares) outpaced growth in GDP from 1930 to 1960.[28]

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[27] Estadísticas Históricas de Mexico, Table 5.6.
[28] Authors' estimates based on data from Solís (1970, chapter 4).

Moreover, a set of rural subsidies sustained high purchase prices of corn and other staples, lifting rural incomes.[29]

Our finding of a reduction in inequality in the mid-twentieth century contradicts a widespread view that inequality rose in this period. Both Middlebrook (1995) and Bortz (1987) claim that inequality rose in the 1950s and 1960s. However, we show in Appendix 1 that these claims are based on income distribution estimates that are not in fact comparable over time, and that the most consistent estimates imply no rise in this period. Moreover, our estimates are consistent with Frankema's (2010) estimates of the labour share of income. Historians have examined the complex relationship between state and labour in this period, highlighting the state's co-optation and control of worker organizations. Regardless of the authoritarianism of the regime, our data suggests that the combination of developmentalist and redistributive policies sustained the lowest levels of inequality seen in the twentieth century. In section 5 below we argue that the rise in wages was driven by a combination of two factors, both necessary: rapid industrialization, and mobilization by workers and the popular sectors that pressured the government to implement progressive policies. These are illustrated by the rise in the minimum wage seen in figure 2, and a rise in subsidies of basic goods aimed at keeping the cost of living low (Ochoa 2000, pp. 1-3).

This arrangement came to an end in the late 1970s. Mexico experienced a currency crisis in 1976 and implemented an IMF-supported adjustment program over 1977-79.[30] The result was cuts to the real minimum wage, falling real wages, and rising inequality, with inequality surpassing the 1900-1910 average from 1980. The debt crisis of 1982 led to further and starker adjustment. Partly in response to the crisis, and partly as a conscious repudiation by the incoming administration of the preceding economic strategy,[31] the government withdrew its direct support for capital accumulation and the political bargain of the previous decades, embracing liberalization, privatization and deregulation. As part of a general fiscal adjustment, social spending was slashed.[32] The 1980s were famously a 'lost decade' for economic growth, with per capita GDP recovering its 1981 peak only in 1997. Per worker GDP, on the other hand, took more than 30 years to recover: it exceeded its 1981 peak only in 2015.

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[29] Doroodian and Boyd (1999).
[30] Boughton (2001: 282-3).
[31] Bruhn (1996).
[32] CEPAL (1992: Cuadro IV-4, p. 98)

While the aggregate economy stagnated, wages declined dramatically, from a historical peak welfare ratio of 3.09 in 1976 to a trough of only 1.12 in 1990. The minimum wage moves in tandem with the actual wage until about 1990. After 1990 the minimum wage remained stable and low, but actual real wages and inequality were both volatile. Real wages dropped rapidly in the five years after the signing of NAFTA in 1994, but recovered equally rapidly. 1999 is the year of the highest inequality over the period of more than two centuries, with y/w taking a value of 4.44. In the same year the welfare ratio was 1.40, only 50 percent higher than its nineteenth century average of 0.91. If we take the averages over 2000-2015, y/w was 3.20 while the welfare ratio was 2.02, just 2.2 times their level in the nineteenth century, compared with an 8.5 times rise in per worker GDP. Our estimates of the median wage imply a very similar story: the median welfare ratio average 0.73 in the nineteenth century, compared with 1.44 over 2005-2015, a rise of 2.0 times.

As discussed above, our primary wage series from 1987 is based on the household employment surveys ENEU/ENOE, but figures 1 and 2 also report the equivalent series from the smaller-sample income and consumption survey ENIGH. The ENIGH data show a qualitatively similar trend but have even starker implications: using these estimates, y/w averaged 4.51 over 2000-2015 while the welfare ratio averaged 1.49, which would mean that real wages were only 63% higher than in the nineteenth century.

Since 1992 the Mexican government has been measuring poverty using absolute poverty lines, so for this period we can compare our welfare ratios with those implied by the official poverty estimates. [33] The 'extreme poverty' basket consists of food only while the 'poverty basket' includes other goods and services in addition and is more than twice as expensive. Our estimated consumption basket is scaled to contain the same number of calories as these modern baskets. Over 1992-2015 the cost of the urban extreme poverty basket averages 1.33 times that of our basket, owing to greater variety of foodstuffs, while the cost of the urban poverty basket is 2.95 times higher.[34] In the period 2000-2015, and using wage estimates from ENEU/ENOE, the welfare ratio using the poverty basket averages 0.69, and 1.54 for the extreme poverty basket, meaning that a construction worker does not earn enough to take a family above the poverty line. This is consistent with the Mexican government's own estimates of income poverty (based on the survey ENIGH), according to

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[33] Poverty data downloaded February 2017 from
http://www.coneval.org.mx/Medicion/Paginas/Evolucion_dimensiones_pobreza_1990_2015.aspx,.
[34] The ratios have no trend and very low coefficients of variation of 0.04 and 0.05 respectively.

which typically just over half of the population was below the income poverty line over 1992-2014: the poverty rate averaged 52.7% over 1992 to 2014, with no consistent trend.[35]

We can summarize our empirical findings as follows. Real unskilled urban wages stagnated from the late eighteenth century until the 1930s. From the 1940s to 1970s they experienced a dramatic rise, with real wages in the 1960s and 1970s 2.7 times their nineteenth century average. Real wages reached their highest ever level in the mid-1970s, and have never returned to that level. Wages collapsed after 1980 and over 2000-2015 they averaged only 2.2 times their nineteenth century average. For comparison, per worker GDP declined in the mid-nineteenth century but embarked on a rising trend towards the end of the nineteenth century. This implied that inequality was lowest in the nineteenth century and the 1940s to 1970s. It was relatively high in the first two decades of the early twentieth century, and highest around the turn of the twenty-first century. The ratio *y/w* averaged 0.71 in the nineteenth century, 1.17 over the 1940s to the 1975, and 3.20 over 2000-2015.

Figure 4: Inequality in Mexico, y/w and the Gini coefficient, 1984-2015
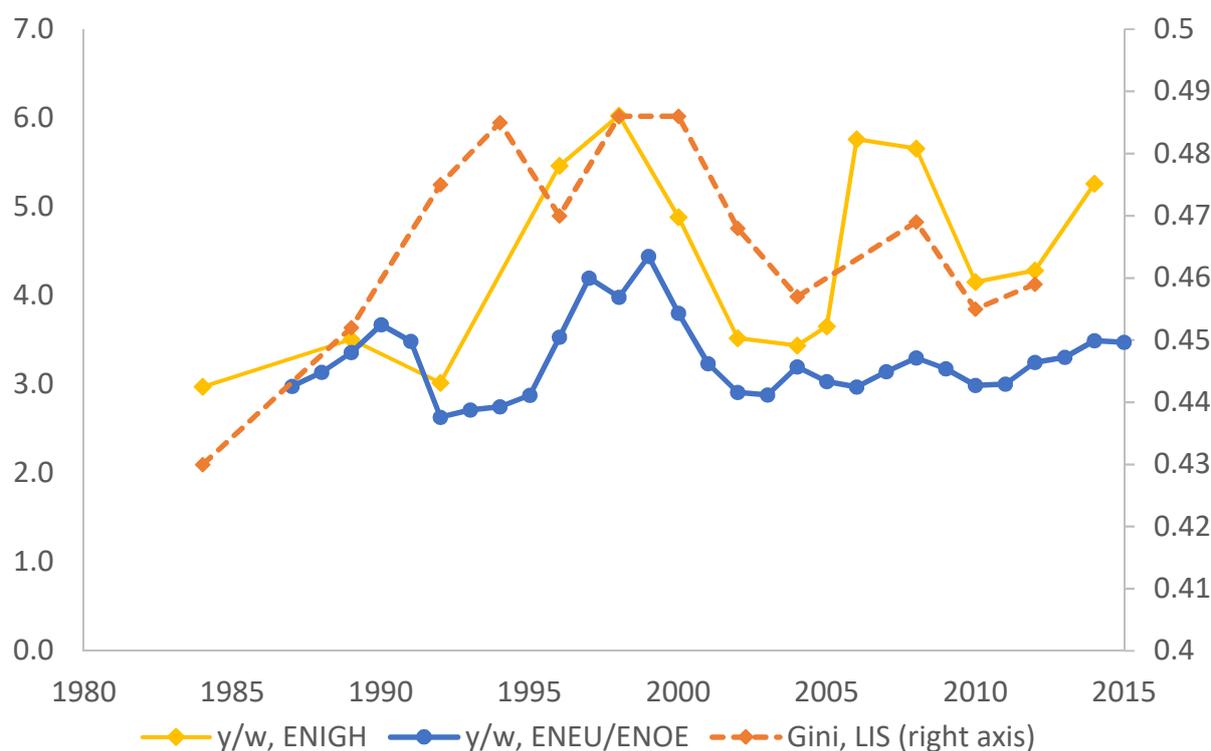
Source: Authors's calculations and LIS [www.lisdatacenter.org/lis-ikf-webapp/app/search-ikf-figures]. See Appendix 2 for data sources. Note: *y/w* is GDP per worker divided by unskilled urban wages. See text for explanation.

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[35] Using 'patrimonio' poverty line 1992-2006 and 'bienestar' poverty line, that described above, 2008-2014. Both lines are estimated for 2008-2012 and are very close, suggesting they are reasonably comparable.

Recent studies have celebrated the decline in inequality in Mexico from the late 1990s or 2000 (Esquivel, Lustig and Scott, 2010; Esquivel, 2011). Figure 4 plots the Gini coefficient reported by the Luxembourg Income Study (LIS) based on ENIGH, along with our measure of inequality *y/w* based on both ENEU/ENOE and ENIGH. The Gini coefficient and *y/w* estimated using ENIGH move very closely, while *y/w* using ENEU/ENOE shows similar changes. All show a substantial rise in inequality leading up to the late 1990s, and a decline in the early years of the twentieth century – although it may have returned to a rising trend in recent years. The decline in the Gini coefficient from 2000 to 2012 is 0.027, close to Atkinson's (2015) threshold for 'salience' of 0.03.[36] When placed in the historical perspective of figure 1, however, this decline looks extremely modest.

5. The theory of economic dualism and inequality: Kuznets versus Lewis

The preceding analytical narrative describes the proximate causes of the observed trends in inequality and living standards. We now turn to the underlying long-term economic mechanisms. We will argue that the relative stagnation in real wages and rise in inequality over the long term was driven by economic forces described by Lewis (1954). The only period that appears inconsistent with the Lewis dual economy model is the mid-twentieth century when real wages rose and inequality declined. We will argue that this was probably driven by institutional and political arrangements implemented under state-led development.

Both Lewis (1954) and Kuznets (1955) analysed economic underdevelopment as the existence of a dual economy divided into traditional and modern (or capitalist) sectors. Both defined *development* as two types of change: a compositional change as the capitalist sector expands employment relative to the traditional sector, and growth in productivity of the capitalist sector. But their assumptions regarding the effect of productivity growth on inequality are different in important ways that, to our knowledge, have not been explored in the literature on inequality and development.[37]

In Kuznets's model traditional sector workers earn a subsistence wage; workers in the capitalist sector earn a higher wage, which rises with productivity in their sector. Inequality is

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[36] The World Bank reports a decline of 0.036 (World Development Indicators).
[37] E.g. Bourguignon (2007) and Arroyo Abad and Astorga (2017) both refer to a "Kuznets-Lewis" model, implying the assumption that the two are identical.

assumed to be higher within the capitalist sector than within the traditional sector, and these within-sector distributions do not change as the modern sector expands its share of employment, nor as it increases in productivity.[38] This means that changes in inequality are driven by changes between, not within, the traditional sector and the capitalist sector.

In Lewis's model, the existence of a 'reserve army' of traditional sector workers keeps industrial wages low, at a level of 'urban subsistence.' This urban subsistence level is higher than the traditional sector wage but, most importantly, it does not automatically rise with productivity in the capitalist sector.[39] This means that the fruits of capitalist development are enjoyed by capitalists, not workers in the capitalist sector. Unlike in the Kuznets model, therefore, rising capitalist productivity increases inequality within the urban sector, not just between sectors. Lewis did not focus on inequality, unlike Kuznets, but he remarked that "The central fact of economic development is that the distribution of incomes is altered in favour of the saving class" (p. 157), which for Lewis is the same as the capitalist class.

It is implicit in the Kuznets model that some kind of labour market segmentation prevents subsistence sector workers from competing with modern sector workers. While Lewis also allows a wedge between real wages in the two sectors, this wedge is static and can be explained by social conventions or efficiency wages.[40] The rising wedge between subsistence and capitalist wages assumed by Kuznets requires some institutional or legal barriers that prevent labour mobility. Without such barriers, wages in the two sectors could not diverge in the way he assumes.

In both cases, rising productivity in the capitalist sector will increase inequality for any decomposable inequality measure:[41] for Kuznets this is through rising inequality between sectors, while for Lewis it is through rising inequality between capitalists and all others. But they can be distinguished using our measure of inequality y/w, where y is per worker GDP and w is the *urban and capitalist* low-skilled wage. In the Kuznets model w will rise with y. Indeed, since y is a weighted average of per worker incomes in the traditional and modern

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[38] Kuznets (1955: 12-16). Anand and Kanbur (1993) analyse what they call the "Kuznets process" in more generality but also assume that within-sector distributions remain constant. Kuznets mentions the possibility of *declining* inequality within the urban sector (p. 17), the opposite of Lewis's assumption, but this is not in the model he presents in the preceding pages.

[39] Lewis argues that real wages are higher in the capitalist sector (he assumes a gap of around 30% [p. 150]) owing to a combination of skill acquisition and social conventions that put a slightly higher value on 'subsistence' in cities than in the countryside.

[40] See Temple (2005) for discussion.

[41] If there is any overlap between the two distributions then the Lorenz curves before and after the productivity rise may cross in the Kuznets model, so a non-decomposable measure such as the Gini could conceivably fall.

sectors, w in the modern sector will rise faster than y so inequality on this measure will decline. In the Lewis model, on the other hand, y/w will rise because w stays constant.

We formalize the differences between Kuznets and Lewis in the simplest possible way. For the Kuznets model we assume two types of people: a share L_t of workers in the traditional sector and a share L_c of workers in the capitalist sector, where $L_t + L_c = 1$. For the Lewis model we add capitalists as an additional group of income recipients, who have measure 0 in the population.

Since it is not relevant to the differences between Kuznets and Lewis, we assume equality among workers in a given sector. Traditional sector workers all receive wage w_t, which is constant, while workers in the capitalist sector receive w_c. We assume that $w_t < w_c$ and that w_t is constant. Following the above discussion, in the Kuznets model w_c is rising in capitalist sector productivity, while in the Lewis model w_c is also constant, with all surplus in the capitalist sector received by capitalists.

Development consists of two types of change: capital widening, which means that L_c rises and L_t falls, and capital deepening (equivalently, neutral technical change in the capitalist sector) implying a rise in labour productivity in the capitalist sector. We illustrate both types of change in both models using Lorenz curves in figure 5. For Kuznets the Lorenz curve has two sections, one for each type of worker. For Lewis it has three sections, one for each type of worker and a third for capitalists. If we assume that in the initial position (before capital deepening) capitalists just break even, receiving no profit,[42] then both the initial position and capital widening are the same in both models, illustrated in figure 5a: the kink in the Lorenz curve moves down and left from point A to point A'. The Lorenz curves in the two scenarios cross, indicating an ambiguous effect on inequality. Anand and Kanbur (1993) showed that this 'Kuznets process' on its own will lead to rising inequality at first as L_t increases from zero, and under certain conditions will reach a turning point after which inequality will then decline, as originally posited by Kuznets.

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[42] This simplifying assumption can be relaxed without affecting the substantive conclusions regarding the differences between the two models.

Figure 5a: Kuznets and Lewis Lorenz curves, initial position and capital widening
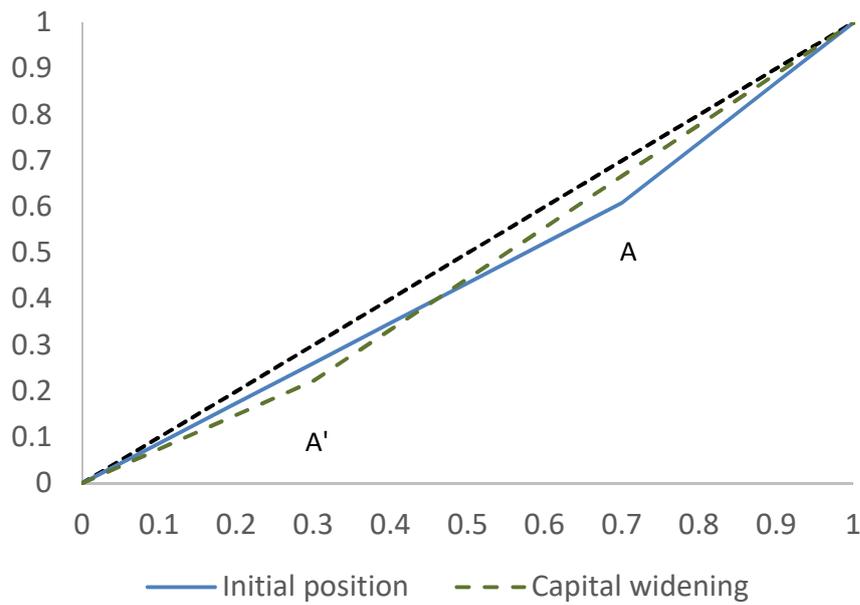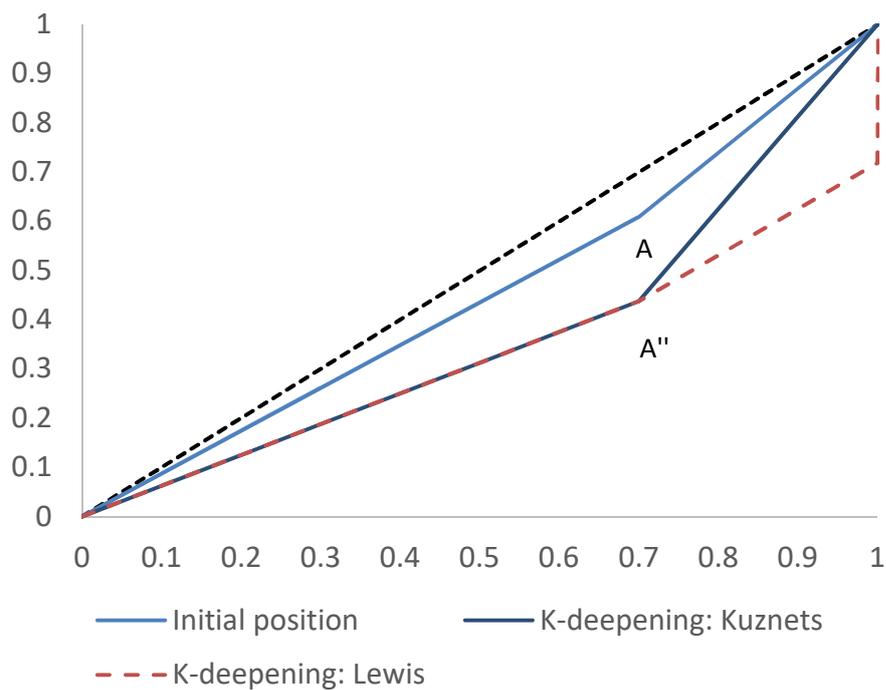

Figure 5b: Kuznets and Lewis Lorenz curves, capital deepening

The difference between the models emerges in figure 5b, illustrating capital deepening. Now the kink in the Lorenz curve shifts vertically down from A to A'', because total income has gone up while traditional sector wages are constant. For Kuznets, capitalist sector wages rise and the second section of the Lorenz curve becomes steeper. For Lewis, capitalist sector wages stay constant and the slope of the second section gets shallower at the

same rate as that of the first section. The extra income is received instead by capitalists, represented by the vertical section at the far right of the Lorenz curve.

In terms of these two models our empirical measure of inequality is y/w_c where y is the sum of all wages and profits. Capital widening will reduce this measure of inequality as capitalist wages represent a rising share of total income. Capital deepening will also reduce this measure for Kuznets, for the same reason. But it will increase inequality for Lewis, as y will increase while w_c remains constant.

The difference for living standards is equally marked. In the Kuznets model mean wages rise consistently through both the compositional effect of a rising share of capitalist workers, and the productivity effect of rising capitalist wages. The median wage will be constant at the traditional wage as long as $L_t > 0.5$, and then jump to the capitalist wage once more than half of workers are in capitalism. It will then continue to rise as productivity rises in the capitalist sector.

In the Lewis model the mean wage will also rise through a compositional effect, but not through the productivity effect, and it will tend to the capitalist wage. The median wage will also be constant at the traditional wage as long as $L_t > 0.5$, and also jump to the capitalist wage once more than half of workers are in capitalism. But unlike in the Kuznets model, that capitalist wage will then remain constant even as productivity continues to rise.

Our presentation of the Lewis model is closely related to Milanovic's (2006) concept of the *inequality possibility frontier*[43] (IPF) and Milanovic, Lindert and Williamson's (2010) *inequality extraction ratio*. The IPF traces the maximum level of inequality feasible for a given society, given its per capita income, and subject to the condition that no one may receive less than a subsistence income. That is, it gives the level of inequality that would obtain if everyone received subsistence income except for one individual, who received all of the remaining income. It is therefore rising in average incomes, and it is a binding (though approximate) constraint in some historical societies. The ratio of actual inequality to maximum feasible inequality is then denoted the inequality extraction ratio. The Lorenz curve associated with the Lewis model differs from the Lorenz curve associated with the maximum feasible inequality in that those workers who are in the capitalist sector receive a modest mark-up over traditional-sector subsistence.

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[43] Milanovic (2006) denotes it the *inequality frontier* but in his later co-authored paper it is given the fuller denomination *inequality possibility frontier*.

Economic Dualism and Urbanization in Mexico

How do the above two models apply to Mexico? Lewis's model applies as long as the capital/labour ratio is low enough that the capitalist sector can employ enough workers to push the marginal productivity of labour down to the subsistence wage, and still have workers left over receiving subsistence incomes. Ranis and Fei (1961) analyse in detail the stages up to the 'Lewis turning point' or 'commercialization point' where the reserve army has run out and capitalists have to compete with each other for workers. At this point wages are pushed up and will rise with productivity. We also note that capitalist wages will rise if subsistence incomes rise, by increasing the outside opportunity of capitalist workers.

Based on the long-run stagnation of real wages, our claim is that our data on inequality and living standards over the long run support the Lewis model. Like the inequality possibility frontier, inequality rose with per worker GDP because it left a higher surplus for the rich minority to capture, after the majority received their subsistence incomes. This implies that Mexico has not reached the Lewis turning point beyond which low-skilled wages are pushed up by competition between employers.

If the subsistence sector, which provides the reserve army of labour, comprised only agricultural workers then this would probably not be plausible. Mexico experienced a rapid rate of urbanization in the mid- and late-twentieth century, and by 2008 agriculture represented only 13% of the total workforce, shown in figure 6. But Lewis observed that the subsistence sector included, in addition to farmers, "the whole range of casual jobs—the workers on the docks, the young men who rush forward asking to carry your bag as you appear, the jobbing gardener…, the petty traders, the retainers (domestic and commercial)" (p. 141-3). When supplemented by "women in the household, and population growth" (p. 145), they provide an unlimited supply of low-skilled workers that could be absorbed by an expanding capitalist sector without putting upwards pressure on wages. Given this observation, the applicability of the model to Mexico is much more plausible. In Mexico City in 1945, for example, the National Federation of Small-Scale Vendors and Industrialists was demanding protection from 'the disadvantageous competition from a floating mass of more than one hundred thousand maladjusted workers, who one day are garbage pickers or porters, and another [day] penny-vendors of fruit and trinkets' (Bleynat 2017, p. 8). [44] This suggests that many urban workers remained in the subsistence sector, representing precisely the labour

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[44] Cornelius (1975: 16) finds that almost half of urban population growth during the 1940-1960 period resulted from rural migration.
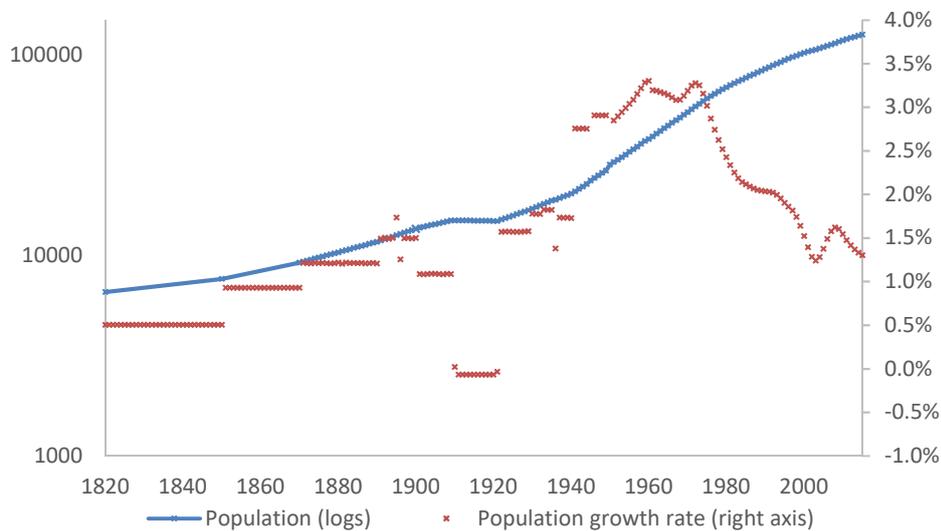
market competition that keeps wages low. Urbanization is therefore not a good measure of the size of the capitalist sector.

Figure 6: Agriculture's share of employment
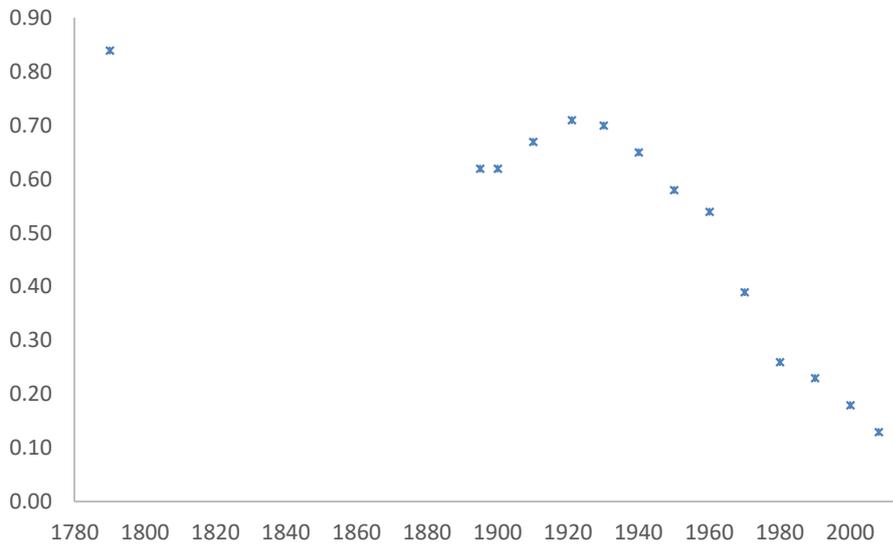
Source: Estadísticas Historicas de México, table 5.9 and table 5.10.

Figure 7: Population level and growth rate, 1820-2015

Source: 1820-1959: Angus Maddison, "Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD", http://www.ggdc.net/maddison/oriindex.htm. 1960-2015: World Bank, World Development Indicators.

Several studies support this view. Germidis (1972) found that 28 percent of construction workers in Mexico City still owned land in the countryside,[45] and described construction work as a gateway from the subsistence to the capitalist sector. Similarly, Ball and Connolly (1987) highlights the connection between the construction industry and peasant and the informal sectors, from which it draws its labour force. Ethnographies of the Mexican poor, such as Oscar Lewis (1951, 1964) for the mid-twentieth century and Hellman (1999) for the late 1970s to early 1990s, provide qualitative evidence of fluid boundaries between the peasant and urban, informal and formal sectors. Maloney (1999), using household survey data for 1990 to 1992, gives quantitative evidence that workers move frequently between formal and informal employment and self-employment.[46] These findings argue against the Kuznets assumption that there were barriers protecting capitalist sector workers in general from competition from subsistence workers.

Lewis was confident that investment would outpace population growth in most countries that were poor in the mid-twentieth century, noting that "rates of growth exceeding 2 per cent per annum are even now rather rare". But Gómez Galvarriato and Silva Castañeda (2007) point out that Mexico's growth rate exceeded 2.5% throughout 1940 to the mid-1970s, peaking in 1960 at 3.3%; by 2000 it had fallen to 1.5%, still higher than Western Europe's mid-twentieth century rate of 1%. They go so far as to argue that this is one of the most important explanations for the fact that Mexico's per capita GDP fell behind that of Spain after 1960. Figure 7 shows Mexico's population and growth rate since 1820.

Given this, what explains the rise in real wages in the mid-twentieth century? One possibility is that the economy was brought to the Lewis turning point: growth in industrial employment was much higher than population growth, averaging 4.7% over 1940 to 1970, as industry's share of employment rose from 12.7% to 23.0%. However, this explanation is hard to reconcile with the subsequent crash in real wages from the late 1970s. Despite economic crises in this period, industrial employment declined little by 1980 and by 1990 its share of total employment was 27.8%, higher than in 1970.

More plausibly, capitalist wages may have been pushed up by rising rural subsistence incomes: we saw that the productivity of peasant agriculture on communally-owned plots outpaced GDP growth 1930 to 1960, while inequality in land holdings declined. It is likely

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[45] 15% were *ejidatarios*, i.e. had rights to communal lands created by land reforms following the revolution, while 13% owned private small-holdings.
[46] Maloney presents this finding as contradicting the 'dualistic view', but as we explain it is consistent with, and even required by, Lewis's version of dualism.

that these two factors increased rural incomes. This could also explain why wages in the 1980s did not fall all the way back to their pre-1930s level.

The difference between the mid- and late twentieth century, however, seems to be explained by political and institutional changes that accompanied rapid growth. It was a period of rapid industrialization, but the Lewis model shows that it was not sufficient for rising wages. This was a period of political as well as economic development, as the government created the corporatist institutions that would manage massive worker and popular sector mobilization. The political bargains of the mid-twentieth century between capitalists, workers and the state, involving subsidies and minimum wages, appear to have been crucial in raising real wages. It is quite possible that wages rose above the marginal productivity of workers in the capitalist sector. Still, high rates of economic growth and industrialization were probably also a necessary condition to sustain these bargains: it is easier to share rising incomes than stagnating incomes. When crisis hit, the state dropped its developmentalist and pro-labour policies, resulting in a return to the underlying economic pressures of the Lewis model. In this way the long-run trajectory is explained by Lewis's economic mechanism, while political and institutional factors were able to sustain substantial diversions from this trajectory for several decades.

We saw that the real wage in the twenty-first century was 80 percent above the level of the nineteenth century, and still too low to lift a family above the modern poverty line. As we saw, the Mexican government's own estimates show that more than half of the population still live below the poverty line. This is consistent with the wage increase being due to a modest improvement in rural incomes, rather than capitalists competing with each for workers. It is also consistent with changing notions of subsistence and acceptability, as opposed to economic forces relating supply of and demand for low-skilled labour: as Lewis notes (p. 172), "The subsistence level is only a conventional idea, and conventions change."

6. Conclusion

Mexico did not suffer the shocks faced by the advanced economies over 1914-1945, nor did it implement a large-scale welfare state in the second half of the twentieth century. Yet in this very different country, we find a similar long-run pattern of inequality to that found in the US and parts of Europe: inequality rose during the Belle Époque, fell to a much lower level in the mid-twentieth century, and rose again in the late twentieth century.

However, workers in these developed countries remained dramatically richer than their predecessors of a century before, despite substantial rises in inequality in the late twentieth century. This fact is consistent with Gregory Clark's (2009) claim that low-skilled workers have been the main beneficiaries of capitalism. We find a very different story. In Mexico, nearly two centuries after independence and more than a century after its first major capitalist boom, the majority of workers have barely escaped subsistence wages. This is confirmed both by our real wage series and by the Mexican government's estimates of poverty.

Our explanation for these long-run trends in Mexico is Lewis's model of the dual economy, in which a reserve army of subsistence workers compete with workers in the capitalist sector, keeping wages low. Within the Lewis model, a modest rise in rural incomes and changing conceptions of subsistence can explain the fact that wages were slightly higher in the twenty-first century than the nineteenth century. Kuznets's model of inequality, on the other hand, is not consistent with the trajectory of inequality and real wages, and both qualitative and quantitative studies contradict his implicit assumption that barriers prevent subsistence workers from competing with capitalist workers.

If the long-run trajectory was determined by Lewis's economic mechanism, however, over shorter periods shifts in the structure of power, and in political bargains, had a large impact on inequality. The revolution of 1910-20 itself had little impact on productive capital, but the changing political and social dynamics that followed led to the rising power of agrarian, labour and popular organizations in the decades that followed. This set the ground for a development model and political arrangements that supported economic growth, raised wages and reduced inequality. The basis of that model was not quite a Western European-style welfare state, but a *sui-generis* combination of minimum wages, land reform and subsidies. After the late 1970s, it was not economic crises per se that caused inequality to rise to historically-unprecedented levels, but rather the political reaction, which unravelled the developmental and distributional model of the mid-twentieth century – returning the economy to the Lewis baseline.

Lewis did not expect his model to apply for so long to most developing countries. He expected capital formation to outpace population growth, leading eventually to rising wages. If it has not by now, will Mexico reach this point? Looking ahead, today's lower rate of population growth is one cause for optimism. But on the other hand, if new capital embodies either skill-biased or labour-saving technology then it will not lead to more demand for low-skilled labour. Summers (2013) proposes a simple aggregate production function in which

capital may be used not only to complement labour, but also to substitute directly for labour. In a country past the Lewis turning point, as in Summers's discussion of the USA, investment in this form of capital will reduce the real wage. But it follows that for a country not yet at the Lewis turning point, this use of capital will postpone the moment – potentially indefinitely – when it reaches it.

Most analysts of economic development recognize that there are times when majorities suffer, rather than benefit, from the process. The optimists do not deny these periods, but believe that there arrives a point when economic forces lead to sustainably rising living standards and falling inequality. In contrast, Piketty (2014) argues that the dynamic of capitalist growth is simply to increase inequality, which is kept in check only by the destruction of wealth or state action in response to political pressures. Lewis, if personally an optimist, explained the mechanism for wage stagnation in developing countries that leads to ever-rising inequality. Mexico's experience supports the pessimistic view of the economic process: the dynamics of capitalist growth over two centuries caused per worker GDP to rise more than eight-fold while real wages only doubled. But it also illustrates the capacity for political mobilization to achieve substantive progressive redistribution, supporting action, not resignation.

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Appendix 1: Alternative data: robustness of main results

In this section we show that our main results are robust to comparisons with plausible alternative datasets. We discuss alternative sources for GDP in the nineteenth century, Gini coefficients over 1950 to 1977, and wages from the mid-twentieth century.

GDP in the nineteenth century

As described above, we use estimates of GDP up to 1877 due to Coatsworth, while for 1895 to 1970 they are due to Banxico. Sanchez Santiró (2010) provides estimates for a different set of years from Coatsworth over 1800-1877 but their average level is virtually identical. However, where the Coatsworth and Banxico overlap, in 1895 and 1910, Coatsworth's estimates average only 78% of the value of Banxico's estimates. This suggests that our series up to 1877 may be underestimated relative to later values, implying that inequality up to 1877 would also be underestimated. In our primary estimates, discussed in the text, we find that *y/w* averaged 0.60 over 1800-1895, and that *y/w* over 2000-2015 was 5.2 times this level. If we inflate the GDP values 1800-1877 by 1/0.78 then *y/w* would average 0.77 over 1800-1895 and the 2000-2015 value would be 4.0 times higher.

Arroyo Abad and van Zanden (2016) estimate GDP per capita in Mexico up to 1800. Their 1800 estimate is just over PPP\$800 (1990 PPPs; read off their Appendix figure 5, p. 1206), about 7% below Coatsworth's estimate of PPP\$755 (1990 PPPs; Coatsworth 2008, p. 547). Thus using their estimate for 1800 would not materially change our findings.

Alternative inequality estimates 1950-1977

Estimates of inequality have been produced for several years in the period 1950-1977, before the establishment of the ongoing household survey ENIGH in 1984, and were analysed by Bergsman (1980) and Altimir (1982).[47] Both point out serious problems of comparability between the different sources over time. Altimir points out that the different years' data were collected by different organizations following different protocols. They are not all defined using the same distribution. Such differences can lead to large spurious differences in measured inequality.[48] A key indicator of problems of comparability is that the

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[47] Székely (2005) combines Altimir's estimates with ENIGH data to produce a series for the period 1950-2004, but acknowledges the comparability problems analysed by Bergsman and Altimir.

[48] For instance, Atkinson and Brandolini (2001) demonstrate that estimates of the Gini for the Netherlands in 1991 vary by more than 4.5 Gini points depending on the source and the definition of the underlying distribution, even among supposedly 'high quality' estimates (read off their figure 2, p. 779).

different years underestimate total household income relative to national accounts (NA) estimates by very different amounts. Bergsman (1980: table 2) reports that total incomes reported in the surveys for 1963 and 1968 are 80 to 82 percent of NA estimates while the surveys for 1975 and 1977 are 56 to 58 percent of NA estimates.

Different authors make different adjustments to the raw data in order to account for these and other differences in the underlying data, but none can be considered definitive. Altimir's figures are the only ones to use a consistent methodology throughout the period, and even so the author notes they should be treated with caution. Like Bergsman (1980), he finds that estimates by other authors are arbitrary and inconsistent and not appropriate for making comparisons over time. This includes the estimates used by Bortz (1987) and by Middlebrook (1995) to support their assertions that inequality rose in this period.[49]

Figure A1: Inequality 1950-1977, Gini coefficient and y/w
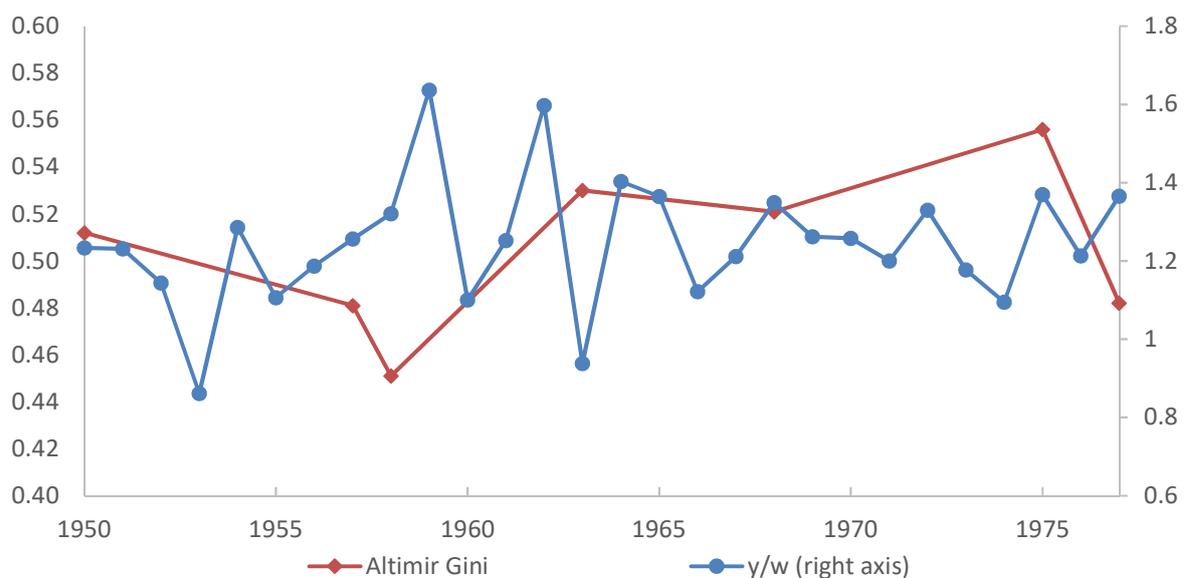
Source: Altimir (1982) for Gini coefficients; figure 1 for *y/w*.

Figure A1 plots Altimir's estimates of the Gini coefficient alongside our estimates of *y/w*. There is a temporary upward spike in 1975, reversed in 1977, but Bergsman points out that 1975 was a smaller and less well executed survey relative to other years and concludes that "the drastic changes implied by the 1975 results were probably in small part actual but

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[49] Middlebrook cites income shares for 1950 due to Navarrete (1970) and for 1968 due to Felix (1982), both reported in Felix (1982). Bergsman explains that Navarrete and Felix use inconsistent methods of adjustment, exacerbating the already-present underlying problems of comparability. Bortz relies on the same set of estimates (including Ginis reported by van Ginneken, 1982, who himself relies on Navarette) and also switches sources and hence methods over time, similarly reducing comparability.

short-run, and in large part due to errors in the survey" (p. 17). Overall, there is no clear trend in the Gini estimates and no evidence that inequality rose over 1950-1977. This is consistent with our finding that there is no trend in *y/w* over the period.

Alternative sources for wage data from the mid-twentieth century

Our wage estimates from 1939 to 1985 are based on Bortz, who used industrial surveys as the source. The surveys report weekly wage averages of all workers (regardless of their skill) based on a small sample of construction companies. In two years covered by the series, 1950 and 1960, the national population census reported a distribution of wages by occupational categories and states. Bortz's wages were 2 and 10 percent higher than the censuses', respectively. The wages from 1987 to 2015 are based on household employment and occupation surveys. We discuss an alternative household survey, ENIGH, in the text. But there are also industrial surveys for the later period, the Encuesta Nacional de la Industria de la Construcción (ENIC) for 1984-2002 and Encuesta Nacional de Empresas Constructoras (ENEC) for 2000-2008, reported in EHM (tables 6.156 and 6.157). They do not provide data specific to Mexico City or its environs but do provide national-level data. Figure A2 plots the welfare ratio using these data, alongside our preferred series, including the 1939-1985 data. They are noticeably higher than our preferred ENEU/ENOE series during the 1980s, but they are extremely close from 1992 onwards.

We also plot the EATSI series for all industrial workers in the Federal District, 1939-1985, alongside Bortz's data for just construction workers in the same zone, for comparison.

Figure A2: Welfare ratios 1939-2015, comparison of alternative data sources
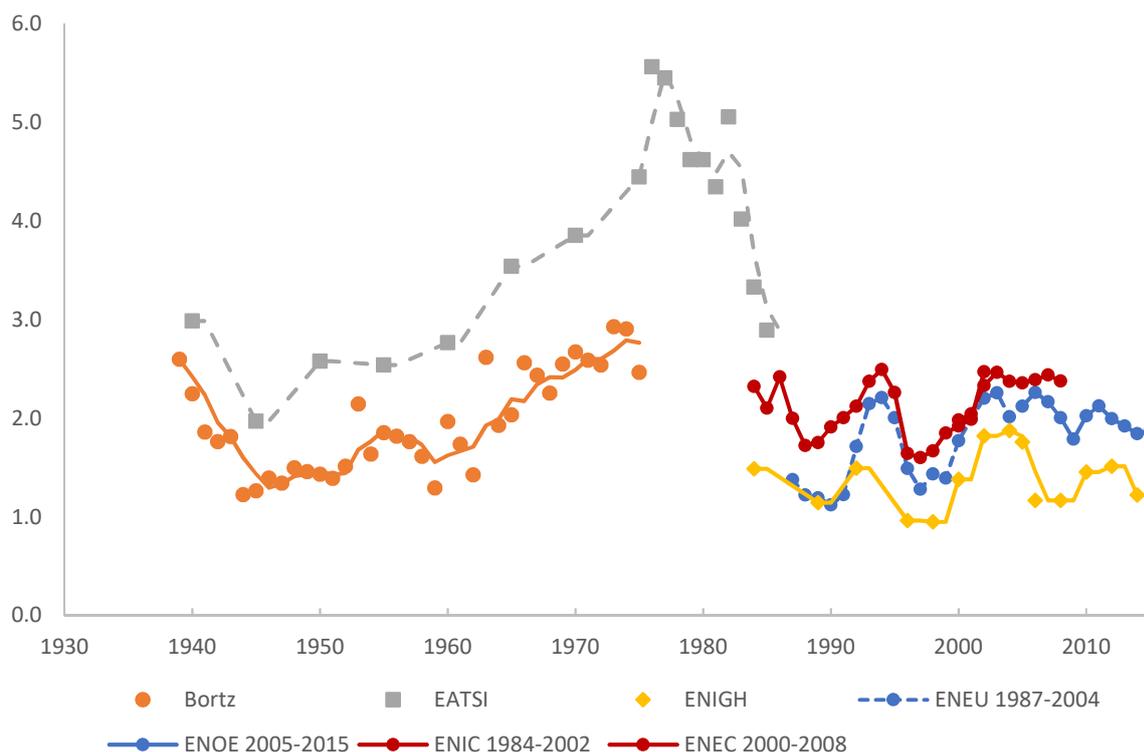
Sources: See text. ENOE is the successor to ENEU and is plotted in the same colour. The same applies to ENEC and ENIC. Notes: Our primary series in the text uses Bortz, extended to 1985 using EATSI growth rates, followed by ENEU and ENOE. Welfare ratios are defined relative to our consumption basket for 3.15 equivalent adults, defined in the text. For Bortz, EATSI, and ENIGH the lines are moving averages.

There are other sources we can also use for comparison with the construction wage. Over the 1820s to 1850s, our series was near the bottom of the urban male pay scale, 15 percent below male textile mill workers and a third higher than those of cook women.[50] At the beginning of the twentieth century, our series is almost at parity with workers in the textile industry of Orizaba, Veracruz in the 1900s and 1910s. In the 1920s Mexico City construction wages slid relative to Orizaba's (from 95 to 67 percent), probably as a result of improvements in the labour conditions of the textile industry after the first collective bargaining agreements (Gómez-Galvarriato, 2013). From 1940 to 1975, our wages were similarly about 66 percent of the national average level in the industrial sector (EHM 2011, Cuadro 6.6); a direct comparison to industrial wages in Mexico City in this period place construction at the bottom of the pay hierarchy within industry (Bortz 1987).

Appendix 2: Data sources and methodology

[50] García Luna (1998, 29), Bazant (1964, 134-137), AHDF, Ayuntamiento, vols. 508 (no. 6), 2300 (no. 20), 2304 (no. 32), 2305 (no. 110), 2306 (no. 14), and 2307 (no. 71).

Gross Domestic Product

Estadísticas Históricas de México (EHM) provide estimates of both real and nominal GDP. The Banco de Mexico (Banxico) initiated the first solid measurements in the 1930s and continued refining the estimates to the present day. The same team that set up the initial methodology created retrospective estimates from 1895 (Solís 1970). Coatsworth (1978; 1989; 2003) estimates GDP in the years 1800, 1845, 1860, and 1877, 1895 and 1910. These reconstructions have been criticized (Salvucci, 1997; Sanchez Santiró 2010), but the revised figures do not imply very different trends and where Sanchez Santiró overlaps with Coatsworth, in 1869, the estimates are identical. More importantly, despite the flaws in the data, Coatsworth (1989)'s estimates are based on a common methodology with documented sources. For this reason we use Coatsworth's estimates up to 1877, and Banxico's for 1895-1970. We use World Bank data from 1971 to 2015. Where Coatsworth's and Banxico's estimates overlap, in 1895 and 1910, Coatsworth's are lower, so in Appendix 1 we show what difference this might make to estimated inequality.

We divide GDP by the number of people aged 15-64, as a proxy for the number of workers, using age estimates from EHM. EHM also reports estimates of the size of the labour force for 1895 to 1990, but these are inconsistent over time and contradict other sources, such as INEGI's estimates. Maddison (1991), whose estimates of per worker GDP are used by Williamson (1997), discusses the difficulties of applying a modern definition of the economically active population to historical data. Prior to 1913, Maddison assumes "that the labour force moved in the same proportion as the population of working age" (p. 250).

Wages

In focusing primarily on construction wages, we follow a common practice in the historical study of real wages (Allen 2001). Construction work is a well typified occupation with a clear set of skills, and is typically (and in the case of Mexico) remunerated in cash, not in rations or services. Even today's definition of "albañil" (mason) work in the National Commission of Minimum Wages closely matches the description of construction work in historical times (with the exception of the use of concrete).

Pay gaps for different skill levels within the category of albañil remain fairly consistent over our whole period. In the 1800-1930 data oficiales (skilled and semiskilled) earn on average 61 percent more than peones (unskilled), where the latter comprise 80 to 90 percent of albañiles. In the industrial surveys of the mid 1980s (ETSIC, 1987, described

below) that distinguished workers by skill, the pay gap is 46 percent. In the household employment surveys for 1987-2015 (ENEU and ENOE, described below), a comparable spread of skill levels is indicated by the fact that the 90th percentile of albañiles have wages 50 percent higher than the 50th percentile.

Our primary series for Mexico City wages are the following:

1. CGG Series: Challú and Gómez-Galvarriato (2015)'s daily wages of construction workers, 1800-1930: Based on Challú and Gómez-Galvarriato (2015)'s study of real wages in eighteenth century Mexico. Their wages relied on the accounting of construction work in public and religious institutions of Mexico City. This long series largely confirmed general unskilled wage trends observed by Allen, Murphy and Schneider (2012), and Arroyo, Davies and van Zanden (2012) in the colonial period, and Gómez-Galvarriato (2013) in the Porfiriato. The data are annualized daily wages of labourers ("peones") in a construction site.[51] Following the literature, we assume 250 work days per year.

2. Bortz Series: Weekly wages of construction workers, 1939-1975. From Bortz (1987)'s average wages in industrial occupations of Mexico City, based on the Encuesta Anual de Trabajo y Salarios Industriales (EATSI or Annual Survey of Industrial Labour and Wages).[52]

3. ENEU/ENOE Series: Quarterly household survey data giving monthly wages after tax. ENEU over 1987-2004 covered urban areas only while its successor ENOE over 2005-2015 covers the whole country. Our primary wage series uses median post-tax wages of construction workers ("albañiles") in Mexico City and Mexico State.[53]

We used growth rates in the following series to extend Bortz's estimates from 1975 to 1985:

4. EATSI Series: Weekly wages of industrial workers in the Federal District, 1940-1985. This is the same source as used by Bortz (1987) but extended to the 1985. They were

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[51] In the earlier working paper version of this study we used a weighted average of wages of labourers and the higher-paid masons ("oficiales" and "albañiles"), resulting in estimates that about 29 percent higher than the labourer series used here. Both series follow the same trends.

[52] The construction industry is reported in Table III-9, 389-390.

[53] ENOE (2009: 118) employment category 5260. In the earlier working paper version of this study we used the average wage rather than the median wage, which included higher-paid construction workers such as brick layers and the higher-skilled "albañil oficial" and "maestro albañil". The use of the median construction worker's wage ensures we can interpret them as low-skill wages.

obtained from EHM Table 6.6, and cross-checked with the original publication. While this series goes beyond construction workers, it is highly correlated to averages and minimum wages in Mexico City's construction industry (see Appendix 1, figure A2).[54] We also used the following series for comparison with our primary series

5. ENIGH series: Household income and expenditure survey, 1984-2014. This is a representative national survey. We used construction workers ("albañiles") in Mexico City and Mexico State. As mentioned in the text, however, the sample of albañiles is much smaller than in ENEU and ENOE.

National median wages are estimated using social tables from the following sources. **1800**: the 1792-93 Census ordered by Revillagigedo supplemented by wages from Tutino (1986); del Raso (1852); Challú and Gómez-Galvarriato, (2015); Van Young (1992); records from the Archivo General Municipal de Puebla, Fondo Tesorería, and the Archivo Histórico del Estado de San Luis Potosí, Fondo Ayuntamiento; Arnold (1988). **1827**: Pamphlet published that year advocating the establishment of a new national lottery provided a table detailing the daily expenditure of nine different social groups other than the indigenous population. We assumed that the expenses of Indians were at the bottom of the distribution. **1845**: del Raso's (1845) detailed social table for the centrally-located state of Querétaro. **1905**: the 1910 census, Tannenbaum (1952), Simpson (1937), Challú and Gómez-Galvarriato (2015) and EHM. **1929**: Census of 1930 (collected in 1929) and Tannenbaum (1952). **1950**: the 1950 Population and Economic Census. For full details of our methodology please contact the authors. In general we expect incomes of high-earners to be under-reported, but this will not affect estimates of median wages. Since these estimates mix sources and are not measured in a consistent way over time, we expect them to be less comparable than construction workers' wages.

Prices

To calculate real wages we need a consumer price index. In this we followed Allen's methodology (2001, 2011 and 2012), pricing a basket of basic consumption goods. The basket is based on a constant composition of products that satisfy the minimum needs of

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[54] The R^2 of the deflated EATSI series and Bortz's construction wages from 1940 to 1975 was 0.626; the R^2 with the deflated minimum wages of construction workers from 1974 to 1985 was 0.857. The latter series in EHM (2011), Table 6.17, "Salario mínimo profesional diario para oficiales de albañilería." EHM wrongly labels this series as "Salario mínimo industrial" (minimum industrial wage). A final note on original publications of the EATSI that we consulted label this series as "salario medio" (average wage).

food, fuel, clothing, and lighting of a household. In practical terms, this means using a Laspeyres (fixed-quantity) index. While Dobado (2015) criticizes the Laspeyres assumption and some simplicities in the price indexes, sensitivity analyses in the literature (Allen, 2001; Allen, Bassino, and Ma, 2011; Allen, Murphy and Schneider, 2015; Challú and Gómez-Galvarriato, 2015) indicate that alternative specifications do not change the long-term trends in real wages obtained with this method.

Our starting point is on Challú and Gómez-Galvarriato (2015)'s basket for Mexico City and its price data for the pre-1930 period. The basket has twelve products: corn, tortillas, bread, beef, pork, beans, lard, sugar, soap, candles, charcoal, and cloth. The set of goods is limited, but ensures comparability over the long term.[55] We scaled the caloric value of the food component to Mexico's the present-day poverty basket (CONEVAL, 2014: p. 96). After 1930 we extended the coverage of food prices to 1979 using the food price index of Mexico City in EHM's Table 18.13 ("Índice de precios de la alimentación en la Ciudad de México"), then to 2011 using item-specific indices from the Banco de Mexico (Banxico), and from 2011 to 2015 using national CPI from INEGI. This produces our first-round estimate, which we then adjust as described below.

Non-food prices were more problematic to extend into the present day given the changes in technology and products. The exception is the price of soap. We extended the price series from 1930 to 1978 using the rate of change in the wholesale price of regular laundry soap (EHM, Table 18.2), and Banxico's retail price of hand soap up to 2011. Lighting is an example of these difficulties. For the pre-1930 period, the price of tallow and then paraffin were used to construct this series. We use a wholesale price series of paraffin that begins in 1960 (EHM, Table 16.2). The missing years (1930 to 1960) were interpolated. The price of fuel presents similar challenges. Charcoal and firewood were the most common fuels in the nineteenth and early twentieth centuries. By the 1940s petroleum and natural gas gained increasing acceptance (Vitz, 2015). While a series of the price of petroleum is available, its evolution is virtually flat and remarkably flatter than other products, even those with heavy subsidies. By contrast, the aggregate of wholesale costs of energy for the production sector (EHM, Table 18.15) has a good correlation with the cost of firewood; its annual rate of change was used to extend fuel prices into 1978. Both candles and charcoal are extended from 1980 using Banxico's index for 'electricity and fuels'.

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[55] We removed pulque and lamb from the calculation, due to lack of information in the twentieth century.

The clothing component before 1930 used the price of the squared meter of *manta* (rough cloth). After 1930 we only had the price of prepared cloths (typically shirts of different kinds), without a clear way to determine the quality of the product. Moreover, the rate of growth was much higher than in other industrial products. For this reason, we opted to rely on wholesale manta prices, which are available since 1960 to 1978 (EHM, Table 18.2). From 1979 we use Banxico's series for 'clothing, footwear and accessories'.

The above describes our first-round estimate. However, it implies the use of indices over more than 80 years after 1930, which means that measurement errors could potentially lead to substantial divergence from actual price levels. For this reason we check the prices of food items in 2015 with absolute unit prices (e.g. M$13.7/kg for corn tortillas) given by CONEVAL in their construction of the Mexican extreme poverty basket.[56] These data indicate that our first-round estimates are very close to the correct level: in 2015 the real cost of the food component of our basket (using CONEVAL unit prices) is 14.4 percent higher than implied by our first-round estimate. (The food component comprises on average 0.88 of the cost of the entire basket in our first-round estimates since 1931.) Our final price series attributes this additional increase to the entire basket linearly over the period 1931-2015, raising the price level by an additional factor of $1.144^{(1/85)}$ each year.

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[56] "Valor de la canasta alimentaria y no alimentaria", downloaded from http://www.coneval.org.mx/Medicion/MP/Paginas/Lineas-de-bienestar-y-canasta-basica.aspx. We were able to download the February 2015 edition. Earlier editions were not available. For lard and maize, which are in our basket but not in the CONEVAL basket, we used the average prices relative to, respectively, pork meat and corn tortillas in three online supermarkets, checked February 2017.

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