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The Standard of Living in Latin America During the Twentieth Century[1]

Pablo Astorga, Ame R. Bergés and Valpy FitzGerald*

Assessing the economic development of Latin America during the twentieth century requires reliable estimates of living standards, as measured by per capita income, life expectancy, and literacy. New comparable series for Latin America suggest that these three indicators made the greatest strides during the period from 1940-80. This progress is probably related to state-led industrialisation, improvements in public health, and urbanisation. Comparison with US levels reveals that, while average per capita income has generally remained steady, relative living standards (measured by a composite welfare index) have risen gradually as life expectancy in the two regions has converged.

Corresponding author:
      Dr V. FitzGerald
      St Antony's College, Woodstock Road,
      Oxford OX2 6JF

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*   Latin American Centre, St Antony's College, Oxford OX2 6JF

I.   Introduction

Although per capita incomes in Latin America grew four-fold during the twentieth century, by 2000 the region still ranked as 'middle-income developing' by World Bank criteria with relatively low 'human development' by UNDP indicators. By contrast, comparable regions such as Southern Europe and East Asia have made considerable more economic and social progress, particularly during the second half of the century. While economic and social indicators within Latin America gradually converged over the century, the rates (and volatility) of economic growth changed markedly in different periods. Contested interpretations of this growth experience set the agenda not only for debates among economic historians but for current policy discussions as well.

The assessment of living standards in Latin America during the twentieth century requires reliable estimates of economic and social indicators, particularly of per capita income. Recent studies of the economic history of the region and of long run economic growth in the world as a whole[2] highlight best efforts to provide output series for some countries in Latin America and select social indicators for particular periods. More recently, the Economic Commission for Latin America and the Caribbean (ECLAC) has published synthesised national output series for the main Latin American economies.[3] Nevertheless, the lack of comparable long run data series of economic and social indicators for the whole region has hampered rigorous assessment of Latin America's long run experience.

The Oxford Latin American Economic History Database (OXLAD)[4] now provides a quantitative basis for the analysis of a wide array of economic and social indicators. The focus in this paper is on per capita income, life expectancy, and literacy, as these are the most relevant of the set of variables that are consistent and available for all countries over the whole century. The data permit a more reliable estimate of changes in living standards for the six major economies (Argentina, Brazil, Chile, Colombia, Mexico and Venezuela, or the 'LA6') since 1900 and for the remaining 13 countries ('LA13') since 1950.[5] The countries that comprise the LA6 are grouped this way for two reasons: first, data coverage for these countries extends the whole of the twentieth century, from 1900 to 2000; and second, these six economies accounted for more than three-fifths of the region's total output since 1945, and for three-fourths of the region's total population since 1900.

Table 1 offers a general overview of the transition in per capita income, literacy, and life expectancy during the twentieth century. Average incomes in 1970 PPP (international) dollars in the LA6 rose almost five-fold between 1900 and 2000 growing at an average compound rate of growth of 1.6 per cent per annum. It is worth noting that the rate of growth increased significantly from the first to the second half of the century, from 1.4 per cent to 1.9 per cent per annum. Average incomes in the 'LA13' between 1950 and 2000 grew at the same rate as the LA6 during the first half of the century. Assuming a constant ratio of LA13 to LA6 growth rates in the two halves of the century, the LA13 would have grown by 1 per cent per annum between 1900 and 1950.

Table 1. *Income, literacy and life expectancy in Latin America*

	1900			1950			2000		
Levels	GDP	Literacy	Life	GDP	Literacy	Life	GDP	Literacy	Life
Argentina	497	51	39	827	88	61	1,459	97	73
Brazil	114	35	29	236	49	43	874	85	68
Chile	284	44	29	577	79	49	1,602	96	75
Colombia	290	34	29	383	62	49	921	92	71
Mexico	240	24	25	507	61	48	1,284	91	73
Venezuela	94	28	28	696	51	51	1,014	93	73
LA6	216	33	29	432	60	48	1,077	89	70
LA13	…	…	…	371	54	45	747	86	69
US	1,478	89	48	3,284	97	68	8,867	99	77
Standard deviation									
LA6	5.3	0.9	0.4	3.5	0.7	0.9	3.5	0.1	0.1
LA13	…	1.0	14.9	6.0	1.0	2.1	3.1	0.3	0.4

Notes: Income: gross domestic product per capita in 1970 PPP dollars; figures for 1900, 1950, and 2000 are 3-year averages of 1900-1903, 1949-1951, and 1998-2000, respectively; literacy: the percentage of the population aged 15 and above able to read and write a simple statement about everyday life; life expectancy: the number of years a newborn infant would live if prevailing patterns of mortality at the time of birth remained unchanged throughout his/her lifetime; convergence: measured by the annual average standard deviation of growth rates.
Sources: Tables A.1, A.3, A.4.

Literacy rates give a broad indication of the region's 'human capital'. Whereas only 33 per cent of the LA6 population over 15 years of age was considered literate in 1900, the proportion almost doubled to 60 per cent by 1950, reaching 89 per cent by 2000. The LA13 lagged behind by about two decades, rising from 46 per cent literacy in 1950 to 82 per cent by 2000. Life expectancy at birth – probably the single most significant indicator of human welfare – more than doubled in the LA6 during the twentieth century, rising from 29 years in 1900 to 70 years by 2000. The LA13 lagged behind by about a decade, with life expectancy rising from 45 years in 1950 to 69 in 2000.

As demonstrated in Table 2, economic convergence (measured by the standard deviation of the growth rates) increased within the LA6. Notably, all countries in the LA6 with the exception of Venezuela made significant gains in per capita income growth from the first to the second half of the century. The evident convergence within the LA6 was spearheaded by the rapid process of catch-up of the 'late starters' Brazil and Mexico to Argentina and Chile; these latter two led the region in per capita income terms at the beginning of the twentieth century. The LA13 saw intra-group convergence on the social front but a clear divergence in incomes from 1950 to 2000.

Table 2. *Growth rates (y) and instability (s) in Latin America*

	1900-1939		1940-1980		1981-2000	
Country	*y*	*s*	*y*	*s*	*y*	*s*
Argentina	1.0	5.0	1.7	4.7	0.6	5.2
Brazil	1.6	4.3	3.7	3.5	0.7	3.8
Chile	1.4	11.2	1.7	4.3	2.6	5.2
Colombia	0.3	3.0	2.1	2.2	0.7	4.2
Mexico	1.0	5.2	3.2	2.9	0.6	4.0
Venezuela	3.9	9.3	2.8	4.4	-0.9	5.0
LA6	1.3	3.5	2.7	2.0	0.6	2.4
LA13	…	…	2.1[a]	1.4[a]	-0.1	2.7

Notes: average annual compound growth rates; instability measured by the annual average standard deviation of growth rates.
   [a] refers to 1945-1980.
Sources: Table A.1.

This paper will explore the trends in per capita income, literacy, and life expectancy, in greater depth. Section 2 examines the periodisation of growth rates and volatility of per capita income between 1900 and 2000, and suggests Latin America's long run development is characterised by clear 'stages of growth'. The period from 1940-80, in particular, emerges as the most dynamic and the least volatile, in both social as well as economic terms. Section 3 complements the data on per capita income with wider indicators of welfare, namely life expectancy and literacy. Analysis of a composite welfare index of living standards, similar to that developed by the UNDP Human Development Office, supports the claim that the middle decades of the century saw the greatest progress of the century. The trends in Latin America's living standards are placed in the context of the United States, Europe, and Asia in Section 4. This comparison reveals that Latin American incomes have failed to converge on US levels, and diverged from European levels. Furthermore, after significant relative improvement in the middle four decades of the century, the ratio of Latin American to Asian per capita income has fallen to pre WW2 levels. However, the 'social gap' with the United States in terms of life expectancy and literacy, has closed over the century. Section 5 concludes.

II.   Long run income trends in Latin America

An accurate assessment of living standards in Latin America during the twentieth century depends on reliable estimates of per capita income. Income, measured by gross domestic product (GDP), must be examined on a purchasing power parity (PPP) basis if this indicator is to be comparable between countries.[6] In practice, the PPP conversion rate of the selected base year to applied to the index of GDP in constant local currency units at prices of the same base year, given that there is no feasible means of adjusting for purchasing power for earlier periods.[7] The method for compiling and estimating per capita GDP in constant 1970 PPP dollars employed here is based on the adjustment factors for 1970 reported by ECLAC.[8] These adjustment factors were chosen for two main reasons: first, they are the only ones specifically

available for the Latin American region; and second, these conversion rates are the closest to the mid-century, which is crucial given the century-long focus of this paper.[9]

Figure 1 offers a long run view of per capita income in Latin America over the century. Average incomes in 1970 PPP (international) dollars in the LA6 grew by 402 per cent from 1900 to 2000, and in the LA13 by 102 per cent from 1945 to 2000. The pace of GDP per capita growth in the LA6 rose in the second half of the century, from 1.4 per cent to 1.9 per cent per annum. If the ratio of LA13 to LA6 growth rates in the two halves of the century is assumed constant, per capita growth in the LA13 rose from 0.9 per cent to 1.4 per cent in the second half of the century. This in turn implies that average per capita income in Latin America as a whole grew at some 1.5 per cent per annum over the twentieth century as a whole: 1.3 per cent in the first half and 1.7 per cent in the second.[10]

Figure 1. *Per capita income in Latin America*
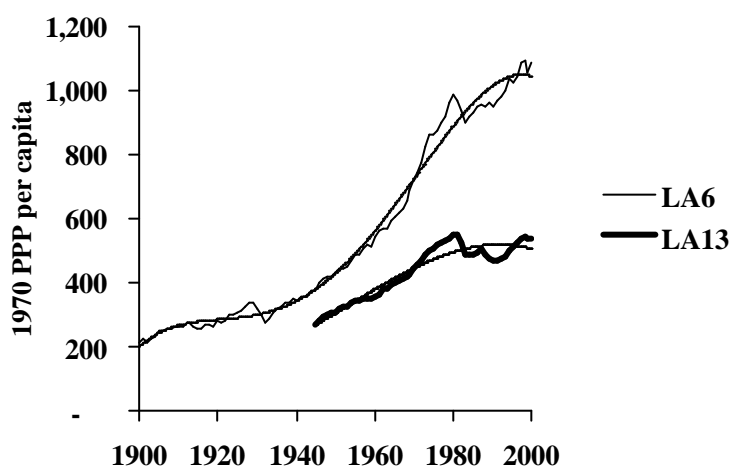
Notes: trendline for LA6: $y = -6E\text{-}05x^4 + 0.4788x^3 - 1397.2x^2 + 2E\text{+}06x - 9E\text{+}08$, $R^2 = 0.9896$.
Trendline for LA13: $y = -0.0016x^3 + 9.6152x^2 - 18768x + 1E\text{+}07$, $R^2 = 0.909$.
Sources: Table A.1.

The sinusoidal pattern of economic growth for the LA6 during the twentieth century appears to suggest a periodisation of growth. The exact dating of these periods is complex and clearly differs by country.[11] However, if we fit a polynomial trend to the weighted mean of per capita income for the LA6, then the points at which the growth trend of the fitted series is equal to the mean growth trend for the whole period of the actual series will determine periodisation. As seen in Figure 2, this occurs at 1939 and 1980.[12]

Figure 2. *Periodisation of per capita income*
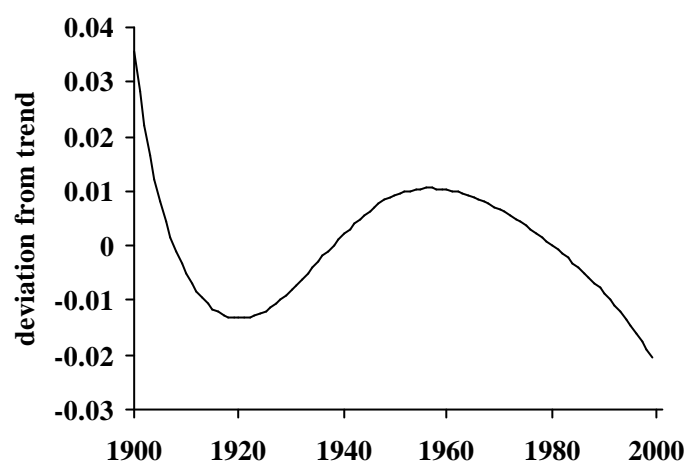
The three distinct periods evident in Figures 1 and 2 above differ markedly in both average growth rates and volatility (as measured by the standard deviation). As evident in Table 2, the first four decades are characterized by low growth rates and high volatility. Although the period is marked by two world trade recessions – in 1918 and 1929 – growth is quite slow and unstable even outside these exogenous shocks.

Mean per capita income in the LA6 grew by just 1.3 per cent per annum with a standard deviation of 3.5. This is conventionally attributed to the reliance on primary exports as the main engine of growth in the region.[13] In contrast, the rate of growth more than doubled to 2.7 per cent per annum in the second period (1940 and 1980), while volatility fell to 2.0. On the basis of this improved record, it is difficult to avoid the conclusion that greater reliance on the domestic market was a major source of growth during the so-called 'import substitution' phase of state-led industrialisation, despite critiques of this growth model on efficiency grounds (namely, its impact on fiscal insolvency and role in the debt crisis).[14]

The third period, between 1980 and 2000, is associated with sweeping economic reform in the region, including monetary stabilisation, trade opening, and privatisation. The results, however, have not been encouraging: at 0.6 per cent, growth rates are even lower than in the first period, and volatility is higher than in the second (2.4). This belies the optimism of reformers until comparatively recently, and sheds some light on the social pressures for change at the opening of the twenty-first century.

The available data for the LA13 mirrors this process of deceleration and increased instability in the second half of the century, but more acutely. Income growth between 1945 and 1980 averaged 2.1 per cent per annum with a standard deviation of 1.4, but per capita incomes fell between 1981 and 2000 to –0.1 per cent per annum, while volatility nearly doubled to 2.7. Exactly why smaller economies should, in the main, display this inferior pattern of lower growth and greater volatility in all three periods

(with some key exceptions, such as Costa Rica) may well be due to the inability of smaller domestic markets to act as a buffer for exogenous shocks.

Although the LA6 group exhibits a decline in growth dispersion over time, the differences between them remain substantial throughout the century. Argentina, Colombia, and Chile embarked on the century as the richest countries in the region, with the best social indicators. By the turn of the twentieth century, Chile had bumped Argentina from the top, and Colombia has been supplanted by Mexico. Indeed, Brazil and Venezuela, who started the poorest of the LA6, performed the best over the century in terms of improved economic and social variables. Broadly speaking, this suggests that there is a 'catching up' process at work within the LA6. A similar process is also implied by the declining dispersion of income levels within the LA13 group between 1950 and 2000. In contrast, the mean income levels in the LA6 and LA13 *diverged* after 1950, with the ratio between the two groups rising from 1.4 in 1950 to 2.0 by 2000. There may be at best, therefore, 'growth clubs' in the region exhibiting conditional convergence.[15]

In light of these results, the period from 1940-80 would appear to merit a somewhat more positive assessment than has become conventional. In this period, growth was not only higher than in the rest of the century but also less volatile, which is a clear advantage. Without a valuation for collective risk aversion, it is not possible to quantify the relative utility of stability and growth. However, given that the periods of lower growth (1900-39 and 1981-2000) were associated with greater volatility, the 1940-80 period was unambiguously superior in welfare terms, whatever the degree of collective risk aversion.[16] Although it is arguable that a continuation of the mid-century strategy would have continued to deliver stable growth, the record does suggest that the reforms of the last quarter of the century have failed to fulfil their promise.

## III.   Trends in social conditions and living standards

Our two 'social' indicators, literacy rates and life expectancy at birth, also made considerable progress during the century, and there is evidence of a similar but less pronounced sinusoidal pattern over the century in both indicators.

Both appear to have grown far steadier than per capita income, but it should be noted that, as stock variables, they cannot exhibit the same type of annual fluctuations that flow variables, such as income, would display. [17]

Figures 3 and 4 illustrate the progress made in literacy and life expectancy. Whereas only 33 per cent of the LA6 population over 15 years of age was considered literate in 1900, the proportion almost doubled to 60 per cent by 1950, reaching 89 per cent by 2000. The LA6 appear to be approaching the natural asymptote characteristic of adult literacy as the main alphabetisation campaigns took place in the earlier part of the century, with 1.2 per cent growth from 1900-39, 2.2 per cent from 1940-80, and 0.5 per cent from 1981-2000. The LA13 followed closely behind, rising from 32 per cent literacy in 1920 to 46 in 1950 and 82 per cent by 2000. The 'big push' period for

literacy in the LA13 (3.0 per cent per annum) occurred between 1940-80. Public education played an important role in this progress, which was also reinforced by the process of urbanisation. As demonstrated in Table 1, both literacy levels and life expectancy in the region also converged over time.

Figure 3. *Literacy in Latin America*
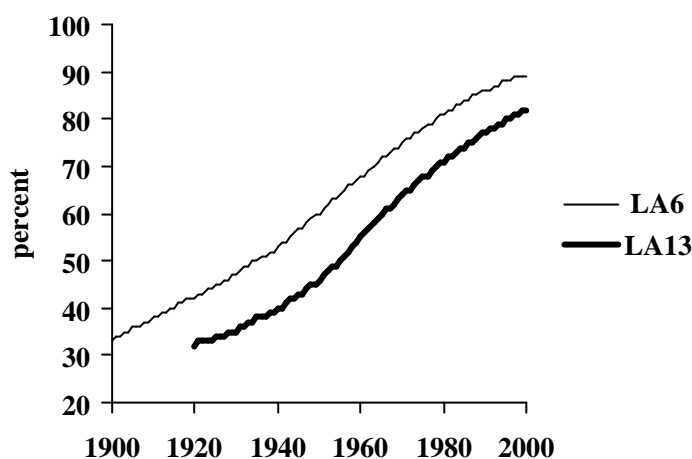
Sources: Table A.3.

Life expectancy in the LA6 nearly doubled over the course of the twentieth century, rising from 29 to 48 to 70 years from 1900 to 1950, and from 1950 to 2000. As was the case with literacy, the three mid-century decades also saw the largest gains in life expectancy. From 1900 to 1940, life expectancy increased an average of three years per decade, rising to seven years per decade between 1940 and 1960, before returning to its previous rate of increase. This rapid increase in life expectancy in 1940-60 was due to public investment in potable water and sanitation, and to wider availability of standard hospital assistance[18], as well as rising incomes and the urbanisation process. The main demographic factor in the increase in life expectancy appears to be a decline in infant mortality rather than an increase in longevity of the elderly evident more recently. Health improvements in the LA13 lagged behind by comparison, with life expectancy rising from 46 years in 1950 to 67 by 2000.

Figure 4. *Life expectancy in Latin America*
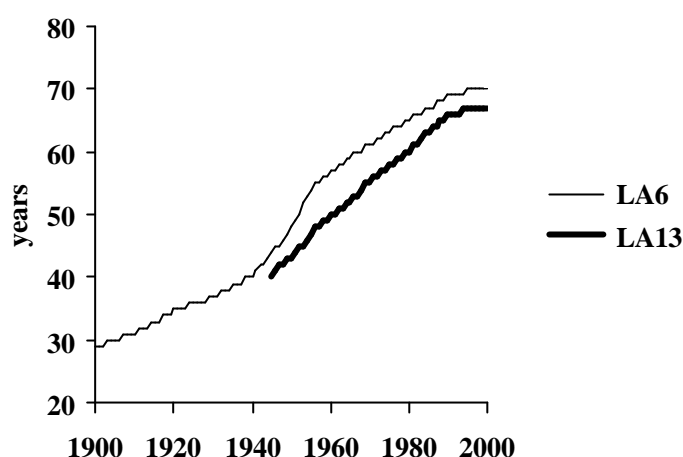
Sources: Table A.4.

It is not entirely clear how to compare these social advances with the economic progress discussed above. Some development economists have adopted the use of composite indices of living standards to combine economic and social indicators and facilitate international comparison. The best known is the 'Human Development Index' (HDI) developed by the United Nations, which incorporates three indicators: per capita income; a weighted average of educational enrolment and literacy; and life expectancy.[19] Composite indicators of this type are open to a number of methodological objections. For instance, the combination of a flow variable (per capita income) with stock variables (life expectancy and literacy), which are characterized by natural asymptotic limits at that, is technically undesirable as the first can vary considerably in the short run while the second and third can only change significantly in the longer term. The use of the marginal utility notion to scale per capita income cannot be anything other than arbitrary, although no more so than not scaling per capita income at all. The equal weighting for all three component indicators in the composite index is also arbitrary, and contains implicit judgements as to the value of life which may well be unacceptable.[20] Despite these caveats, both economic historians and UNDP country offices are increasingly using this metric (and variations on this metric in the latter case) to incorporate other assessments of welfare change in addition to the standard, income/national accounts approach.[21]

The 'Historical Living Standard Index' (HLSI) is similar to the HDI with two important differences: first, due to limited data availability and coverage on enrolment rates, literacy is the only indicator of education; and second, for purposes of long run comparison, the indicators are measured against a base year of 1950. The HSLI for country (*i*) is calculated as:

$$H_i = \frac{1}{3}\left[\left(\frac{\log y_i - \log 100}{\log 40{,}000 - \log 100}\right) + \left(\frac{life_i - 25}{85 - 25}\right) + \left(\frac{lit_i - 0}{100 - 0}\right)\right],$$

where y_i is per capita income in 1970 international dollars of country (i), *life$_i$* is life expectancy at birth in country (i), and *lit$_i$* is the literacy rate in country (i). Note that the index compares the actual situation of country (i) to that of an ideal hypothetical target.

Figure 5 illustrates the overall movement of the HSLI from 1900 to 2000. This shows that the standard of living in the LA6 – our proxy for Latin America – increased four-fold over the century as a whole. However, although standards almost doubled from 0.17 in 1900 to 0.30 in 1935 and more than doubled to 0.62 by 1980, they rose to just 0.68 by the end of the century. The pace of growth of living standards for the LA13 stagnated after 1980 as well.

Figure 5. *Historical living standard index (HSLI)*
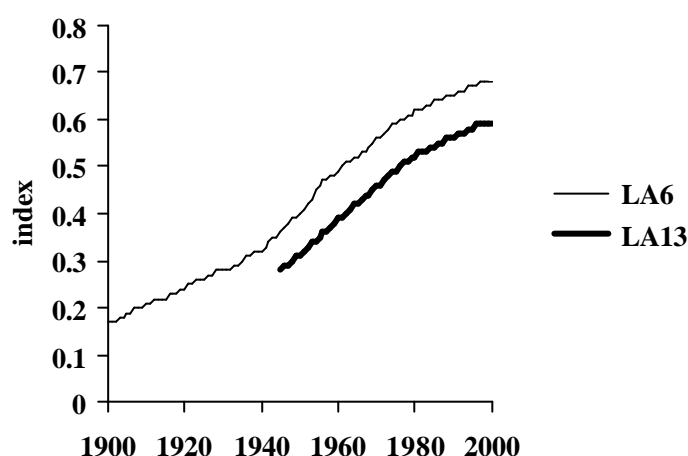
Sources: Table A.5.

The HSLI also allows us to shed some light on the convergence process within the LA6. As illustrated in Figure 6, there is strong evidence of a catch-up process within the LA6. The richest countries with the best social indicators in 1900 were Argentina, Colombia, and Chile, with living standards twice as high as Brazil, Mexico, and Venezuela. By 2000, however, Chile has knocked Argentina from the top to second place, and Mexico has replaced Colombia in third place. Brazil and Venezuela, who started out the poorest of the LA6, performed the best over the century with a 725 per cent and 975 per cent increase in income over the century, or cumulative annual average growth rates of 2.1 per cent and 2.4 per cent, respectively. The period between 1935 and 1980 was clearly crucial to the catch-up process; after 1980, the two sets of countries decelerate together.

Figure 6. *Convergence in living standards within the LA6*
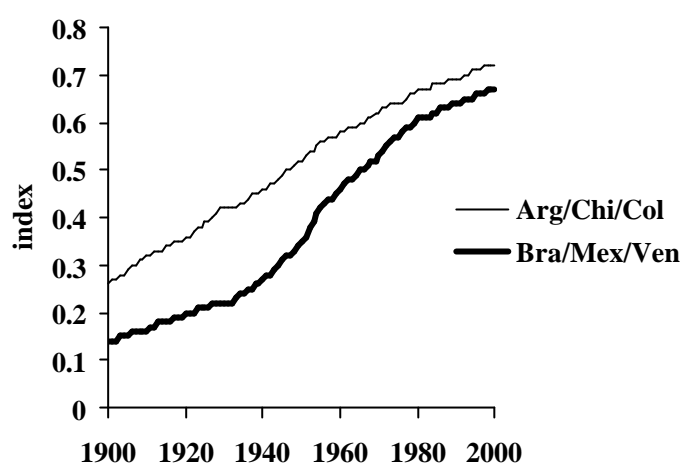
Sources: Table A.5.

IV.   Convergence in living standards

Living standards in Latin America during the twentieth century saw dramatic improvement, particularly during the period between 1940 and 1980. However, assessment of this apparent progress would be incomplete without comparison with other regions. This section sets Latin American living standards during the twentieth century against living standards in the United States, Europe, particularly Southern Europe as a more appropriate comparator in terms of industrialisation at the beginning of the century, and Asia.[22]

Broadly speaking, while life expectancy and literacy converged on US levels, incomes failed to follow suit. Per capita income in the LA6 fell from 15 per cent of the US level in 1900 to 13 per cent in 1950 and 12 per cent in 2000 (Table 4).[23] Per capita incomes in the LA13 diverged significantly from US levels in the second half of the century, falling from 10 per cent in 1950 to only 6 per cent in 2000.

Table 3. *Per capita income, adult literacy and life expectancy relative to the US*

Country	1900			1950			2000		
	GDP	Literacy	Life	GDP	Literacy	Life	GDP	Literacy	Life
Argentina	34	58	81	25	90	89	16	98	95
Brazil	8	39	61	7	51	63	10	86	88
Chile	19	49	60	13	81	71	18	97	98
Colombia	20	38	60	12	63	71	10	93	93
Mexico	16	27	52	15	62	70	15	92	94
Venezuela	6	31	58	21	52	75	11	94	95
LA6	15	38	60	13	62	70	12	90	92
LA13	…	…	…	10	47	64	6	83	87

Notes: as for Table 1.
Sources: Tables A.1, A.3, A.4.

As seen in Figure 7, income per capita in the LA6 does not converge on the US average, and indeed diverges in the case of LA13 after 1980. Although there was some narrowing of the income gap in the 1930s, this was due to the unequal impact of the Great Depression in the two regions and its stronger effect on the US economy. The reappearance of the income gap and the 'trend ratio' in the 1940s indicates the extent to which Latin America had de-linked from the US economy during WWII. There are some signs of convergence in the postwar period until 1980, after which the divergence is marked. Interestingly, the countries with the best social indicators relative to the US at the outset (Argentina and Chile) diverged from US income levels, while those with the worst (Mexico and Brazil) converged, raising some interesting questions regarding the conventional assumptions of endogenous growth.[24]

Figure 7. *GDP per capita relative to the US*
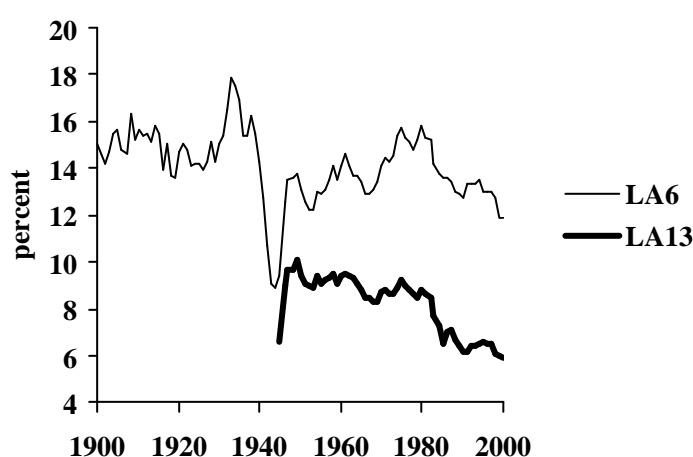
Sources: Table A.1.

The evident convergence in literacy rates shown in Figure 8 is notable but not entirely unexpected, with steady relative improvement over the century to 90 per cent of US

literacy rates by 2000. The period following the 1940s, in particular, saw significant convergence in literacy rates both between the LA6 and the LA13, as well as with the US average.

Figure 8. *Literacy rates relative to the US*
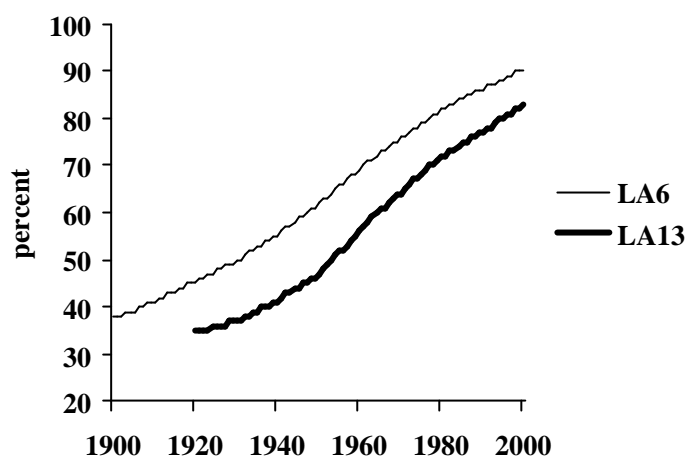
Sources: Table A.3.

Life expectancy at birth is possibly the most reliable single indicators of relative quality of life for comparison across cultures, although concerns regarding the 'quality' of extended longevity, particularly in terms of geriatric health, may arise.[25] In this dimension at least, the LA6 demonstrated remarkable convergence on US standards (Figure 9). Life expectancy at birth in the LA6 relative to the US remained stable until the 1940s, when it began to converge rapidly, reaching 80 per cent of the US average by 1955. By 2000, the LA6 had narrowed the gap from 19 years in 1900 to just seven years. By contrast, it took the LA13 until the early 1970s to converge on the US average.

Figure 9. *Life expectancy at birth relative to the US*
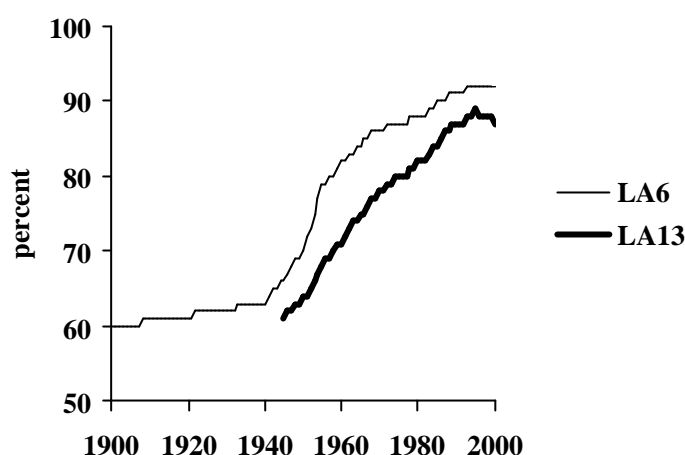
Sources: Table A.4.

This convergence of life expectancy, combined with the assumption as to the declining marginal utility of income, suggests that there has indeed been a slow convergence of living standards in the LA6 and the LA13 upon the standards in the USA (Figure 10).

Figure 10. *Historical living standards relative to the US*
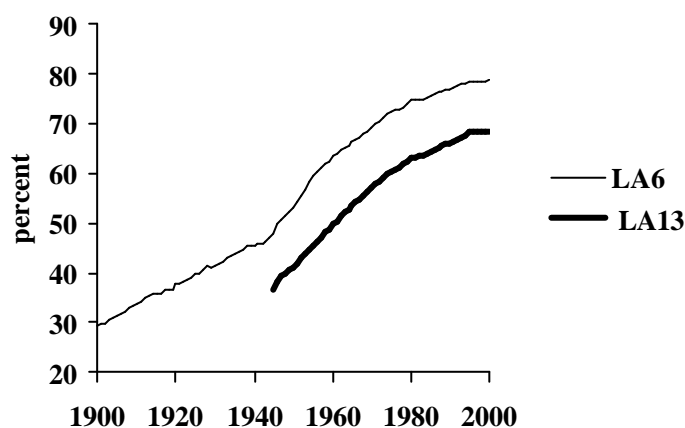
Sources: Table A.6.

Argentina is the main exception to this pattern of convergence. As seen in Table 4, Argentina started out the century with the standard of living closest to that of the US (59 per cent) and far ahead of the rest of Latin America. However, its living standards grew by just 3.7 per cent per decade, compared to 10.4 and 10.7 per cent per decade in the LA6 and LA13, respectively, and well below Brazil and Venezuela at 11.4 per cent and 16 per cent per decade. Argentina's dismal performance is mainly attributable to the 55 per cent decline in relative income levels over the course of the

twentieth century.

Table 4. *Historical Living Standards Index relative to the US*

	Argentina	Brazil	Chile	Colombia	Mexico	Venezuela	LA6	LA13
1900	59	25	39	34	23	18	29	…
1910	68	27	45	35	28	20	34	…
1920	70	28	48	36	36	24	38	24
1930	75	31	58	41	34	35	41	27
1940	78	35	57	46	42	41	46	36
1950	80	41	65	54	55	55	53	41
1960	84	56	72	63	64	67	63	50
1970	85	62	77	69	71	77	69	57
1980	85	69	81	74	77	79	75	63
1990	83	72	84	78	80	80	77	66
2000	85	74	87	79	82	81	78	68

Sources: Table A.6.

By contrast, some smaller countries in Latin America were able to make impressive gains on living standards relative to the US despite a growing divergence in per capita incomes. Uruguay, Costa Rica, and Cuba are three notable examples. Even as early as 1900, life expectancy at birth in Uruguay was actually higher than that of the US (Table 5). Although it fell behind slightly during the century, it remained within 4 per cent of US rates. Similarly, literacy in Uruguay rose from 67 per cent that of the US rate in 1900 to 85 per cent of US rates by 1940, and 99 per cent of US rates by 2000 at the same time that income decline from 27 per cent of US levels in 1940 to 16 per cent by 2000. Costa Rica was also able to close the living standards gap with the US: literacy rates more than doubled to 92 per cent of the US value in 1980, reaching 97 per cent in 2000; by 2000, life expectancy in Costa Rica was within 1 per cent of that in the US. Similarly, literacy in Cuba was well within 10 per cent of the US level by 1980 with a life expectancy equal to that in the US.

Table 5. *Historical Living Standards Index relative to the US*

	Literacy			*Life Expectancy at birth*		
	Uruguay	Costa Rica	Cuba	Uruguay	Costa Rica	Cuba
1900	67	40	52	102	66	67
1940	85	76	80	91	76	70
1980	95	92	93	95	98	100
2000	99	97	98	97	99	99

Sources: Tables A.3, A.4.

Nevertheless, the evidence on social convergence must be qualified on a few counts. The extremely unequal income distribution in Latin America implies that only the richest 5 per cent reached per capita income levels comparable with the average US citizen in 1970 (85 per cent); median incomes were less than 9 per cent of the US average (Table 2). The evidence on social convergence should also be qualified with reference to the quality of health and education in Latin America. In the 1990s, public education expenditure as a proportion of GDP in the US was roughly twice that in the LA6; public health expenditure was more than double.[26] Adjusting for relative GDP in PPP dollars, the ratio of per capita expenditure on health and education in the LA6 to the US in the 1990s was just 6 per cent and 5 per cent, respectively.[27]

Placing Latin America's per capita income performance during the twentieth century in the international context is particularly revealing (Figure 11). Not only has there been no sustained economic convergence with the Northern European countries of England, France, and Germany, but Latin America also fell behind the countries of Southern Europe (Spain and Italy). Average LA6 incomes ranged from 25 to 30 per cent of those in Southern Europe between 1900 and 1930. The gap narrowed during the next two decades due to the impact of the depression and war in Europe, as well as Latin America's stronger growth performance so that by 1945 the LA6 had reached 54 per cent of Southern European levels. Nevertheless, the second half of the century saw the original gap restored by 1960. High returns on human capital investment coupled with the process of economic integration prompted an acceleration of Southern Europe's growth rate; the spread of the welfare states raised longevity.

The Argentine case offers a clear illustration of this catch-up/fall-behind phenomenon. In 1900, Argentine per capita income was comparable to that of Southern Europe ($487 versus $632) at 77 per cent, and had improved to 74 per cent of Southern European income levels by 1950. Since then, however, Argentina's per capita income has since fallen steadily to just 24 per cent of Southern European levels in 2000.

Asia (India, Indonesia, and South Korea) offers an interesting comparison.[28] The ratio of LA6 GDP per capita to Asian levels averaged 115 from 1900 to 1939, but then grew by 3.0 per cent per annum from 1940-80 to peak at 233.8 in 1980. The impact of the debt crisis can be seen clearly in the dramatic reversal during the 1980s and 1990s, with the 3.0 per cent per annum fall in the ratio to levels not seen since the 1930s.

Figure 11. *GDP per capita relative to Northern and Southern Europe, Asia, and the US*
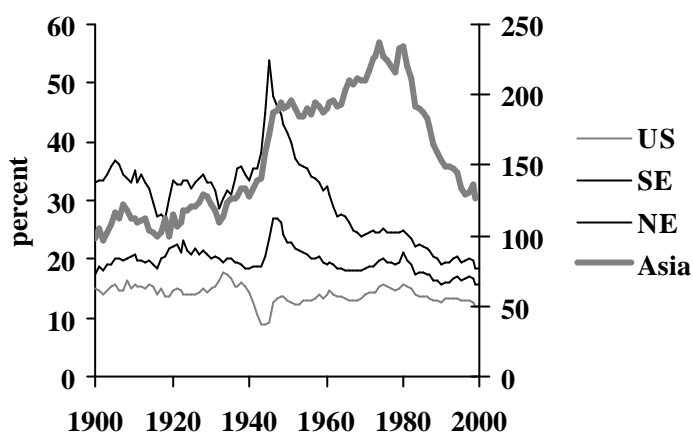
Notes: average income per capita relative to Asia lies on the secondary axis.
Sources: Table A.1.

It should be further noted that whatever successes have been achieved in Latin America are not representative of the whole region. Indeed, the extremely unequal income distribution in Latin America means that average income levels (i.e. the mean) far exceed the income of the average person (i.e. the median). In 1970, only the richest 5 per cent of the regional population reached per capita income levels anywhere near the US average (56 per cent). Table 7 documents the worsening trend in income distribution since 1970.[29]

Table 6. *Per capita income distribution in Latin America relative to the US average*

Year	Latin America [a]	Richest 5%	Richest 15%	Richest 20%	Poorest 40%	Poorest 20%	US
GDP per capita (1970 PPP$)							
1970	470	2819	940	1,410	286 [b]	82	5,070
1985	605	…	…	1,638	191	132	6,836
1990	595	…	…	1,754	135	84	7,623
1997	693	…	2690 [c]	2,110	…	96	8,321
Relative to the US (%)							
1970	9.3	55.6	18.5	27.8	5.6 [b]	1.6	100.0
1985	8.9	…	…	24.0	2.8	1.9	100.0
1990	7.8	…	…	23.0	1.8	1.1	100.0
1997	8.3	…	32.3 [c]	25.4	…	1.2	100.0

Notes: The mean for Latin America is weighted by population.
    [a] 1970 refers to Argentina, Brazil, Colombia, Chile, Mexico, and Venezuela; 1985 refers to the average of 1984-1986 for Mexico (1984), Peru (1985/86), and Venezuela (1985/86) weighted by country population; 1990 refers to the average of 1989-1991 for Bolivia (1990/91), Brazil (1989), Colombia (1991), Costa Rica (1989), and Panama (1989) weighted by country population; 1997 refers to the average of 1996, 1998 for Brazil (1998), Chile (1998), Colombia (1996), Mexico (1998), and Venezuela (1996) weighted by country population.
    [b] refers to middle 60 per cent.
    [c] refers to richest 10 per cent.
Sources: Table A.1; income distribution data for 1970 from Bulmer-Thomas, *Latin America*, p. 314, Table 9.6, for 1985 and 1990 from Ramos, *Poverty*, p. 143, Table 2, for 1997 from World Bank, *Data query*.

6.   Conclusions

This paper has made use of a new long run inter-country comparable data set for Latin America to examine the evolution of living standards in the region from 1900 to 2000. While tentative, the analytical results seem to lead to two main conclusions.

Firstly, the main sub-period of development in Latin America during the twentieth century occurred between 1940 and 1980 with the unprecedented surge in economic growth and social improvement. That this coincided with the so-called 'import substitution' process is not surprising insofar as public investment and state-led basic education and health initiatives were associated with the rise in growth rates and the improvement of standards of health, despite the inefficiencies and distortions generated by forced industrialisation.[30] Urbanisation and the creation of an industrial working class may well have played important roles as well. It seems clear that this period saw the greatest structural change in the Latin American economy, and was marked by sustained and relatively stable growth and social improvement. In stark contrast, the periods from 1900 to 1940 and from 1980 to 2000 saw lower economic growth and far more instability.[31]

Poor economic growth and greater volatility appear to be related to exposure to

exogenous primary export shocks in the first four decades of the century, and by the debt crisis and the subsequent process of macroeconomic stabilisation and trade liberalisation. It could be argued that frustration with the development experience to 1940 precipitated the prioritisation of deepening domestic markets and industrialisation to 1980, while that experience, or at least the associated fiscal imbalances, in turn spurred a shift in focus toward macroeconomic stability and trade liberalisation that characterized the 1980s and 1990s.[32] In this light, the three sub-periods in Latin America's economic and social development should not be considered to be discrete, but rather continuous and contingent, events. It should nevertheless be noted that the four decades in the middle of the century stand out for the outstanding progress made by nearly every country in the region, and that, given the negative picture painted in recent economic literature, a reappraisal would be in order.

Secondly, social convergence occurred in the absence of economic convergence. It is far from clear why there has been virtually no economic convergence between Latin America and the US over the twentieth century, or why per capita incomes within Latin America have diverged. Even when evident differences in the quality of life are taken into account, the convergence of life expectancy between Latin America and the US is difficult to explain in the context of the enormous disparities in median income and social expenditure. Per capita income, literacy, and longevity appear to move together between 1900 and 1940 in the LA6, with income growing faster initially and then more slowly thereafter, while poor economic performance since the 1980s in the LA13 did not forestall continued progress on the social front. Although the divergence between per capita income on the one hand and longevity and literacy on the other partly reflects the inherent 'inertia' of the latter two as stock variables, it also implies that classifying a particular decade as a 'success' or 'failure' while subsuming the social with the economic may be misguided. Nevertheless, these patterns of growth and convergence raise some interesting questions regarding the relationship between economic growth and social progress, and suggest that the more simplistic endogenous growth models may need some rethinking.[33]

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Appendix

The discussion of long-run trends in Latin American per capita income, literacy, and life expectancy generally focuses on two country groupings: 'LA6' comprised of Argentina, Brazil, Chile, Colombia, Mexico and Venezuela; and 'LA13' consisting of the remaining countries in the region excluding Cuba. These country groupings weigh the values of the variables for each country by the respective population size to obtain the mean.

The complete data set may be downloaded with accompanying sources and notes from http://oxlad.thedesignfly.net.

Table A.1 *GDP per capita, 3-yr average*

PPP$	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
Argentina	497	658	586	695	723	827	941	1,206	1,333	1,116	1,460
Bolivia	…	…	…	…	…	236	189	270	337	289	329
Brazil	114	132	155	171	198	235	339	471	801	829	874
Chile	284	344	318	502	484	577	679	862	958	1,096	1,602
Colombia	290	266	236	272	330	383	440	545	770	863	925
Costa Rica	…	…	370	554	524	370	469	655	887	860	998
Dom. Rep.	…	…	…	…	…	234	299	376	549	508	685
Ecuador	…	…	…	…	169	244	290	358	522	513	507
El Salvador	…	…	109	178	190	273	329	407	426	367	475
Guatemala	…	…	169	266	413	342	364	453	588	507	583
Haiti	…	…	…	…	…	118	128	122	159	126	91
Honduras	…	…	145	265	195	227	250	285	316	317	317
Mexico	240	289	330	311	352	507	628	877	1,138	1,125	1,284
Nicaragua	…	…	115	200	186	219	288	428	299	181	186
Panama	…	…	…	…	…	462	570	890	1,053	981	1,255
Paraguay	…	…	…	…	304	296	302	352	575	585	560
Peru	…	…	…	…	…	331	420	526	622	462	560
Uruguay	…	…	…	…	664	864	902	963	1,148	1,131	1,457
Venezuela	94	104	128	364	418	695	961	1,198	1,230	1,024	1,015
LA6	216	264	272	319	348	432	538	716	970	959	1,078
LA13	…	…	240	261	333	313	357	441	544	469	538
US	1,478	1,712	1,886	2,142	2,481	3,284	3,826	5,125	6,295	7,398	8,867

Notes: 3-year averages except for 1900, 2000: 1900-2, 1998-2000, respectively; and 1920 for LA13: 1920-2. GDP figures in constant local currency units rescaled to 1970 prices before conversion to purchasing power parity (PPP) prices using 1970 adjustment factors given in Table A.2. LA13 for 1920, 1930: Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua only; 1940: LA13 excluding Bolivia, Dominican Republic, Haiti, Panama, and Peru. GDP in 1970 PPP prices for US calculated by applying index of GDP volume in constant PPP prices to US GDP in 1970; for Europe and Asia calculated by first applying the ratio of country GDP in 1990 PPP prices and US GDP in 1990 PPP prices to US GDP in 1970 to derive GDP in 1970 PPP prices for 1970, and then applying index of GDP volume in constant PPP prices.

Sources: All population data for Latin America are from Wilkie, *SALA*. Population data for US, Europe, and Asia from Maddison, *Monitoring*, for 1900-94; for 1995-2000 for US and Europe from International Monetary Fund, *Financial statistics*, for Asia from World Bank, *Indicators*. GDP in constant 1970 local currency units: Argentina: ECLAC, *Series históricas*, for 1900-76, Hofman, *Economic development*, for 1977-94 and ECLAC, *SYLA, 1997; SYLA, 2002*, for 1995-2000; Bolivia: ECLAC, *Series históricas*, for 1945-76 and ECLAC, *SYLA, 1982; SYLA, 1984; SYLA, 1987; SYLA, 1993; SYLA, 1996; SYLA, 1997; SYLA, 2002*, for 1977-2000; Brazil: IBGE, *Estatísticas*, for 1900-19, ECLAC, *Series históricas*, for 1920-76, IBGE, *Estatísticas*, for 1977-88, ECLAC, *SYLA, 1993; SYLA, 1998; SYLA, 2002*, for 1989-94, IBGE, *Time-series* for 1995-2000; Chile: Hofman, *Economic development*, for 1900-07, Ballesteros and Davis, *Output*, for 1908-39, ECLAC, *Series históricas*, for 1938-76 and ECLAC, *SYLA, 1981; SYLA, 1985; SYLA, 1993; SYLA, 1997; SYLA, 2002*, for 1977-2000; Colombia: Hofman, *Economic development*, for 1900-24, ECLAC, *Series históricas*, for 1925-76, Banco de la República, *Indicadores*, for 1977-93, ECLAC, *SYLA, 1997; SYLA, 2002*, for 1994-2000; Costa Rica: Bulmer-Thomas, *Political economy*, for 1920-44, ECLAC, *Series históricas*, for 1945-76, ECLAC, *SYLA, 1982; SYLA, 1986; SYLA, 1993; SYLA, 1997; SYLA, 2002*, for 1977-2000; Dominican Republic: ECLAC, *Series históricas*, for 1945-76, ECLAC, *SYLA, 1981; SYLA, 1985; SYLA, 1989; SYLA, 1993; SYLA, 1997; SYLA, 1999; SYLA, 2002*, for 1977-2000; Ecuador: ECLAC, *Series históricas*, for 1939-76 and ECLAC, *SYLA, 1984; SYLA, 1987; SYLA, 1993; SYLA, 1996; SYLA, 2002*,

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Table A.2 *PPP adjustment of GDP per capita, 1970*

	GDP per capita in 1970		Conversion rates in 1970	
	US$	PPP$	OER	PPPR
	(1)	(2)	(3)	(4)
Argentina	940	1,208	3.79	2.95
Bolivia	206	272	11.90	9.03
Brazil	418	464	4.59	4.14
Chile	819	850	11.28	10.87
Colombia	316	546	18.44	10.68
Costa Rica	506	659	6.63	5.09
Cuba	…	…	…	…
Dominican Rep.	326	375	1.00	0.87
Ecuador	244	359	20.64	14.00
El Salvador	276	406	2.50	1.70
Guatemala	338	450	1.00	0.75
Haiti	97	121	5.00	3.99
Honduras	244	279	2.00	1.75
Mexico	630	886	12.49	8.88
Nicaragua	389	424	7.00	6.41
Panama	673	885	1.00	0.76
Paraguay	240	353	126.00	85.41
Peru	420	529	38.70	30.72
Uruguay	779	980	250.00	198.68
Venezuela	1,078	1,212	4.45	3.96
US	5,070	5,070	1.00	1.00

Notes: col. 1, GDP per capita in US dollars at current prices in 1970; col. 2, GDP per capita in constant 1970 international PPP dollars in 1970; col. 3, Official nominal exchange rate in 1970, local currency units per US dollar; col. 4, PPP-adjusted exchange rate.
Sources: col. 1 and col. 2, as for Table A.1; col. 3, Argentina, Brazil, Colombia, Mexico, Peru from Officer, *Exchange rates*, annual average daily exchange rate, Bolivia, Chile from World Bank, *Indicators*, annual average market rate, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Panama, Paraguay, Venezuela from IMF, *Financial statistics*, annual average market rate, Nicaragua from ECLAC, *ISTMO Centroamericano*, Uruguay from Wilkie, *SALA*, selling (import) rate; col. 4, Economic Commission for Latin America and the Caribbean, *Series históricas*, p. 8.

Table A.3 *Literacy rates*

%	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
Argentina	51	60	68	75	82	88	91	93	94	96	97
Bolivia	19	20	23	25	28	32	44	58	69	78	86
Brazil	35	35	35	40	44	49	60	68	76	81	85
Chile	44	53	63	75	73	79	84	88	92	94	96
Colombia	34	39	44	52	57	62	70	78	84	89	92
Costa Rica	36	47	58	67	73	79	83	88	92	94	96
Cuba	46	57	64	71	76	78	79	89	93	95	97
Dom. Rep.	…	…	29	26	30	43	65	67	74	79	84
Ecuador	33	38	42	46	51	56	66	74	82	87	92
El Salvador	26	27	27	28	35	42	48	58	66	73	79
Guatemala	12	13	15	19	24	29	36	45	53	61	69
Haiti	8	8	8	9	9	11	16	22	31	40	50
Honduras	28	30	32	34	35	40	45	53	62	69	75
Mexico	24	30	35	36	46	61	65	75	82	88	91
Nicaragua	…	…	39	39	39	38	47	57	61	65	67
Panama	17	27	42	46	59	67	73	79	85	89	92
Paraguay	31	38	45	52	59	66	73	80	86	90	93
Peru	24	29	33	37	42	51	60	72	80	86	90
Uruguay	51	60	68	75	82	88	90	93	95	97	98
Venezuela	28	29	32	36	42	51	62	77	84	89	93
LA6	33	38	42	47	53	60	68	75	81	86	89
LA13	25	28	32	35	40	46	55	64	71	77	82
US	89	92	94	95	96	97	98	99	100	100	99

Notes: The illiteracy rate is defined as the percentage of the population of or above a certain age (usually 15) who cannot read and write a simple statement about everyday life. In practice, however, the illiteracy rate can sometimes refer to the percentage of the population of or above a certain age (usually 15) with less than two years of primary school enrolment, or may be self-defined. Reported figures come from census data, interpolations between census years. LA13 for 1900, 1910 exclude Dominican Republic and Nicaragua.
Sources: All literacy figures are from Hunt, S., 'The human condition in Latin America, 1900-95,' Consultancy report for Thorp, R., *Progress, Poverty and Exclusion: An Economic History of Twentieth Century Latin America* (Baltimore, 1998), for 1900-60, World Bank, *Indicators*, for 1970-90, UNDP, *Literacy*, for 2000.

Table A.4 *Life Expectancy at birth*

Years	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
Argentina	39	44	49	53	56	61	65	67	70	72	73
Bolivia	26	28	31	33	36	40	43	46	52	58	62
Brazil	29	31	32	34	37	43	55	59	63	66	68
Chile	29	30	31	35	38	49	57	62	69	74	75
Colombia	29	31	32	34	38	49	57	61	66	69	71
Costa Rica	32	33	37	42	49	56	62	67	72	76	76
Cuba	32	36	39	42	45	56	64	70	74	74	76
Dom. Rep	…	…	…	26	34	44	52	58	64	69	67
Ecuador	…	…	…	…	…	48	53	58	63	68	70
El Salvador	…	…	28	29	36	44	50	57	57	66	70
Guatemala	24	24	25	25	29	38	46	52	58	63	65
Haiti	…	…	…	…	…	36	42	47	52	56	53
Honduras	…	…	29	34	36	39	46	53	60	67	66
Mexico	25	28	34	34	39	48	57	61	67	71	73
Nicaragua	…	…	24	28	34	39	47	54	59	64	68
Panama	…	…	…	36	42	50	61	65	70	72	74
Paraguay	25	29	33	38	42	48	55	61	67	69	70
Peru	…	…	…	…	37	40	48	54	60	66	69
Uruguay	49	52	52	50	58	66	68	69	70	72	74
Venezuela	28	29	31	32	38	51	60	65	68	71	73
LA6	29	31	35	37	40	48	57	61	65	69	70
LA13	31	33	33	34	38	43	50	55	60	66	67
US	48	52	57	59	64	68	70	71	74	75	77

Notes: Life expectancy at birth is defined as the number of years a newborn infant would live if prevailing patterns of mortality at the time of birth remained unchanged throughout his/her lifetime. To complete the series for the aggregate of Latin America in 1945, Ecuador and Haiti figures in this year are obtained by subtracting one year from the figure of 1950. LA13 for 1900: Bolivia, Costa Rica, Guatemala, Paraguay, and Uruguay only; 1920: Bolivia, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, and Uruguay only; 1930: Bolivia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Panama, and Uruguay only; 1940: Bolivia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Panama, Peru, and Uruguay only.
Sources: All life expectancy figures are from Hunt, *Human condition*, for 1900-90, UNDP, *Deepening democracy*, for 2000.

Table A.5 *Historical living standard index (HLSI)*

	1900	*1910*	*1920*	*1930*	*1940*	*1950*	*1960*	*1970*	*1980*	*1990*	*2000*
Argentina	0.34	0.41	0.46	0.51	0.56	0.61	0.65	0.68	0.71	0.71	0.74
Bolivia	…	…	…	…	…	0.24	0.28	0.36	0.45	0.50	0.56
Brazil	0.14	0.16	0.18	0.21	0.25	0.31	0.43	0.50	0.58	0.61	0.64
Chile	0.22	0.28	0.31	0.40	0.40	0.49	0.56	0.62	0.68	0.72	0.75
Colombia	0.19	0.22	0.23	0.28	0.33	0.41	0.49	0.55	0.62	0.66	0.68
Costa Rica	…	…	0.35	0.41	0.46	0.51	0.57	0.63	0.69	0.72	0.73
Cuba	…	…	…	…	…	…	…	…	…	…	…
Dominican Rep.	…	…	…	…	…	0.30	0.43	0.48	0.56	0.60	0.62
Ecuador	…	…	…	…	…	0.36	0.43	0.50	0.58	0.62	0.64
El Salvador	…	…	0.13	0.15	0.22	0.30	0.37	0.45	0.48	0.54	0.60
Guatemala	…	…	…	0.12	0.18	0.24	0.30	0.38	0.46	0.51	0.55
Haiti	…	…	…	…	…	0.11	0.16	0.21	0.28	0.32	0.31
Honduras	…	…	0.17	0.22	0.21	0.26	0.32	0.39	0.46	0.52	0.54
Mexico	0.13	0.17	0.23	0.23	0.30	0.42	0.50	0.57	0.64	0.68	0.71
Nicaragua	…	…	…	0.18	0.21	0.25	0.34	0.43	0.45	0.47	0.50
Panama	…	…	…	…	…	0.45	0.54	0.61	0.66	0.69	0.72
Paraguay	…	…	…	…	0.35	0.41	0.47	0.53	0.62	0.65	0.66
Peru	…	…	…	…	…	0.32	0.41	0.49	0.56	0.59	0.64
Uruguay	…	…	…	…	0.56	0.63	0.66	0.68	0.70	0.72	0.75
Venezuela	0.11	0.12	0.16	0.23	0.29	0.42	0.52	0.62	0.66	0.68	0.70
LA6	0.17	0.21	0.24	0.28	0.32	0.40	0.49	0.56	0.62	0.65	0.68
LA13	…	…	…	0.18	0.31	0.31	0.39	0.46	0.52	0.56	0.59
US	0.57	0.61	0.65	0.68	0.71	0.76	0.78	0.80	0.83	0.85	0.87

Notes: LA13 for 1920, 1930: Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua only.
Sources: as for Tables A.1, A.3, and A.4.

Table A.6 *Historical living standard index (HSLI) relative to the US*

%	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
Argentina	59	68	70	75	78	80	84	85	85	83	85
Bolivia	…	…	…	…	…	31	36	45	54	59	64
Brazil	25	27	28	31	35	41	56	62	69	72	74
Chile	39	45	48	58	57	65	72	77	81	84	87
Colombia	34	35	36	41	46	54	63	69	74	78	79
Costa Rica	…	…	54	61	65	67	73	79	83	84	84
Cuba	…	…	…	…	…	…	…	…	…	…	…
Dominican Rep.	…	…	…	…	…	39	55	60	67	70	72
Ecuador	…	…	…	…	…	48	56	62	69	73	74
El Salvador	…	…	20	22	30	40	47	56	58	63	69
Guatemala	…	…	…	18	26	31	39	48	55	60	63
Haiti	…	…	…	…	…	14	21	26	33	37	36
Honduras	…	…	27	32	30	34	41	48	55	61	62
Mexico	23	28	36	34	42	55	64	71	77	80	82
Nicaragua	…	…	…	27	30	33	43	53	54	55	57
Panama	…	…	…	…	…	59	69	76	80	81	83
Paraguay	…	…	…	…	49	54	60	67	74	76	75
Peru	…	…	…	…	…	42	52	61	67	70	74
Uruguay	…	…	…	…	79	83	85	85	85	84	86
Venezuela	18	20	24	35	41	55	67	77	79	80	81
LA6	29	34	38	41	46	53	63	69	75	77	78
LA13	…	…	…	27	44	41	50	57	63	66	68
Standard deviation											
LA6		0.7	1.0	1.4	0.8	1.0	0.9	0.4	0.4	0.2	0.1
LA13				0.6	1.8	0.9	1.1	0.7	0.7	0.4	0.3

Notes: annual average standard deviation of growth rates.
Sources: as for Table A.5.

[2] For instance Bulmer-Thomas, *Latin America;* Maddison, *Monitoring*.

[3] See Hofman, *Economic development*.

[4] This database is available in electronic form from Astorga, Bergés and FitzGerald, *OXLAD.* Unless otherwise noted, all data are from this database. A previous version was published as the statistical appendix to Thorp, *Progress.* Although the database contains a much broader collection of economic and social indicators, the focus here is on per capita income, literacy, and life expectancy, as these are the most relevant series that are available on a consistent basis for all countries and for the whole century.

[5] Cuba is excluded due to the lack of reliable GDP estimates for the whole of the century. Data on Cuban GDP are available only from 1985 onwards, see ECLAC, *SYLA, 1999; SYLA, 2001* and Oficina Nacional de Estadísticas de Cuba, *Anuario estadístico.* Prior to 1985, official sources of Cuban economic performance report only Gross/Global Material Product (GMP) figures, in accordance with Cuba's use of the Soviet Material Product System (MPS). Estimating GDP from GMP figures is complicated by the fact that the latter excludes non-material services and takes a 'gross value' rather than a 'value-added' approach; on this see Mesa-Lago, *Socialist Cuba;* Brundenius, *Revolutionary Cuba;* Mesa-Lago, *Mixed economies.*

[6] This is because exchange rates used to converted income are often misaligned (i.e. they are fixed or managed by the government, rather than being determined by free market forces), and because nontraded services must be revalued on an internationally comparable basis.

[7] In principle of course, one would expect the discrepancy between PPP and market prices to diminish as an economy develops industrially and further integrates with the world economy. This would imply in turn that a single PPP adjustment factor as used here would probably underestimate past PPP income levels in Latin America, and thus overestimate both long-run growth rates and intra-regional convergence.

[8] Economic Commission for Latin America and the Caribbean, *Series históricas*, p. 8; see Table A.2.

[9] It should also be noted that there are large disparities between different PPP sources. For instance, the ratio of per capita income in PPP$ for Argentina to the US in 1990 is 19% according to Heston and Summers, 'Penn World table', and 30% according to Maddison, *Monitoring*; the latter is more than double our ECLAC-based ratio of 13%. Thus, the Heston and Summers and Maddison estimates of real GDP in PPP prices would generally be higher than ECLAC estimates.

[10] Compared to 1.0% and 3.5% p.a. growth for Southern Europe over the same two periods, see Table A.1 in the Appendix.

[11] Technically, this can only be done satisfactorily by estimating a time-series econometric model for each country and testing for structural breaks in the parameters. This approach is taken in Astorga, Bergés and FitzGerald, 'Endogenous growth', which draws on the OXLAD database to test models of endogenous growth.

[12] A case could be made for extending the analysis backwards to the 1880s, since the periodisation in Figure 2 indicates growth rates to 1908 were above the long-run average. However, the data are simply unavailable to permit such an analysis.

[13] See Cárdenas, Ocampo and Thorp, eds., *Export age;* Cárdenas, Ocampo and Thorp, eds., *Industrialization.*

[14] See Dornbusch and Edwards, *Populism;* Cárdenas, Ocampo and Thorp, eds., *World crisis.*

[15] As suggested by Baumol, 'Productivity growth'.

[16] The lower welfare cost of a higher but volatile growth rate for per capita income as compared to a lower but steadier growth rate with the same mean is formally equivalent to the 'proportionate risk premium' that an investor would be willing to pay for a riskless portfolio with similar expected returns to his or her existing (risky) portfolio. This is given by $p = \frac{1}{2}fs^2$ for a given coefficient of relative risk aversion, or CRRA (f), and standard deviation (s) of the expected returns, see Elton, Gruber and Blake, 'Risk-adjusted mutual fund performance'; Elton, Gruber and Blake, 'Survivorship bias'. The logarithmic utility function for per capita income used by the UNDP in the Human Development Index (see discussion below) implies a CRRA of unity. Thus, a 5% growth rate in per capita income over a decade with a standard deviation of 2% would be equivalent in welfare terms to a steady annual growth rate of 3% over that decade.

[17] A more accurate measure of educational attainment would be mean years of schooling, but sufficient data pre-1950 to permit a long-run study are simply not available.

[18] See Thorp, *Progress.*

[19] The United Nations HDI measures longevity by life expectancy at birth, educational attainment by a weighted average of adult literacy and combined primary, secondary and tertiary enrolment rates (weighted two-thirds and one-third respectively), and wealth by the logarithm of GDP per capita in PPP dollars. The ranges are themselves constrained: the range for life expectancy at birth is from 25 years to 85 years; from 0% to 100% for adult literacy rate and combined gross enrolment ratio; and from PPP$100 to PPP$40,000 for GDP per capita in international dollars, see United Nations Development Programme, *Deepening democracy.*

[20] This arbitrary weighting has been defended by the UNDP on the grounds that there is no way of ascertaining the substitutability of any one variable for any other variable, see Jahan, *Measuring living standard.* A more rigorous approach would be to establish how the economic values of longevity and education are set in practice, through evidence such as insurance valuations or private returns to investment in

schooling, see Usher, *Measurement of economic growth*. Unfortunately, such data are not available over time or on a comparable basis for Latin America. Moreover, the implicit substitutability between living standard indicators implies that even with scaling, the 'value of life' in poor countries is considerably lower than that of rich countries.

[21] See Offer, *Economic welfare*; United Nations Development Programme, *Eradicate poverty;* United Nations Development Programme, *Deepening democracy* and various national development reports, for instance UNDP Bulgaria, *Human development report*.

[22] Although the United States enjoyed a considerable advantage over Latin America at the start of the century in terms of living standards, it is nevertheless an important comparator, given that it remains the benchmark used by many in the region and continues to wield major influence on the region's foreign trade and investment.

[23] Indeed, standard statistical tests indicate that the long-run trend in the ratio of per capita income in the LA6 and the US is stationary.

[24] Patterns of long-run economic growth in the region are explored further in Astorga, Bergés and FitzGerald, 'Endogenous growth'.

[25] Still, it could equally be argued that family support for the old in Latin America provides a better 'quality of life' than geriatric hospital care in the US.

[26] Calculated with figures from World Bank, *Indicators*.

[27] Calculated with figures from United Nations Development Programme, *Deepening democracy*.

[28] These countries are chosen because their data coverage permits analysis for the whole period from 1900 to 2000.

[29] The incidence of poverty in Latin American households rose by 6% during the 1980s to reach 41% in 1990. Although poverty rates had fallen back down to 36% by 1997, many countries in the region saw an increase in poverty in the years leading up to 2000; ECLAC estimates that some 224 million people in Latin America and the Caribbean were living in poverty at the turn of the century, see Economic Commission for Latin America and the Caribbean, *Equity gap*.

[30] See Thorp, *Progress*.

[31] The analysis of trends in sectoral labour productivity and total factor productivity growth should shed some light on this process, see Astorga, Bergés and FitzGerald, 'Productivity'.

[32] See FitzGerald, 'ECLA'.

[33] We will address these issues and attempt to distinguish exogenous from endogenous factors in Astorga, Bergés and FitzGerald, 'Endogenous growth'.