

***When Did Latin America Fall Behind?.***

***Evidence from Long-run International Inequality***

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***ABSTRACT***

*When did Latin America fall behind?. Has the gap between developed countries and Latin America widened over time?. This paper addresses these recurrent questions with the tools provided by the inequality literature. Long-run inter-country inequality is assessed in terms of real (purchasing power-adjusted) GDP per head and of an 'improved' human development index as an indicator of welfare for present-day OECD and Latin America. A long term rise in income inequality is observed for this sample of countries with the deepening gap between OECD and Latin America as its main determinant. Contrary to a widespread view, in terms of income, Latin America fell behind in the late twentieth century. Inequality in terms of human development declined over time, but the gap between OECD and Latin America remained largely unchanged.*

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## I. *Introduction*

When did Latin America fall behind?, Has the gap between the developed countries, the Core, and Latin America, the Periphery, widened over time? are recurrent questions among economic historians. The idea of long run relative decline since independence has been favored in the literature (see, for example, Victor Bulmer-Thomas (1994: 410)), while it is widely accepted that the origins of modern Latin American retardation are located in the nineteenth century (John Coatsworth, 1993, and Stephen Haber, 1997). Coatsworth (1998) emphasizes that Latin America fell behind between 1700 and 1900, while the gap with the US remained unchanged during the twentieth century. The evidence on comparative real product per head assembled by Pablo Astorga and Valpy Fitzgerald (1998: 353) lends support to this view<sup>1</sup>.

Explanatory hypotheses for the early failure of Latin America emphasize the radically different evolution of Anglo and Latin Americas reflected the imposition of distinct metropolitan institutions on each colony (North, 1990). The break with the metropolis destroyed institutions that provided credible commitments to rights and property within the Spanish empire and, as a result, widespread turmoil, violence and political instability took place after independence with the consequence of sluggish economic growth (North, Summerhill and Weingast, 2000). Initial inequality of wealth, human capital and political power conditioned institutional design and, thus, poor performance in Latin America relative to the US (Engerman and Sokoloff, 1997).

Views from the *Dependencia* school concur. The failure to achieve sustained and balanced growth over the nineteenth-century was a result of the persistence of colonial heritage in the new republics (Stanley and Barbara Stein, 1970)<sup>2</sup>. *Dependentists* saw the opening to the international economy as a cause of increasing inequality across and within countries, stressing the role of the terms of trade in Latin American retardation by shifting resources to primary production (Hans Singer, 1950) and by provoking *immiserizing* growth (Raúl Prebisch, 1950).

As interpretations of early backwardness rest on a long-run comparison between Latin America and the US it must be stressed that most countries, including those of Western Europe, fell behind over the nineteenth century when measured by American standards. Moreover, the common claim that Latin America's relative position to the U.S.

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<sup>1</sup> In a recent paper, however, Astorga, Bergés and Fitzgerald (2004) stress that per capita income for a sample of thirteen countries diverged from the US in the second half of the twentieth century.

<sup>2</sup> The Steins (1970: 128) stress, however, US exceptionalism, "the existence of a huge, under-populated virgin land of extraordinary resource endowment directly facing Europe and enjoying a climate comparable to that of Europe represented a potentiality for development which existed nowhere else in the New World".

remained mostly unaltered during the twentieth century is at odds with the catching up experience in large areas of the Periphery (Southern and Eastern Europe, Southeast Asia) where the gap with the U.S. in terms of income per head was significantly reduced after 1950. The US seems, therefore, a questionable yardstick to assess Latin America's economic performance (Prados de la Escosura, 2004b).

Whether Latin America fell behind in the late twentieth century or in the early nineteenth century has important consequences for the ongoing debate on the causes of Latin America's retardation. If Latin America's backwardness has its origins in the decades following independence the institutional and factor endowment discrepancies with the US and Western Europe are relevant to its explanation. If, however, retardation occurred in the late twentieth century, institutional and factor endowment differences between Latin and British Americas during the colonial period and the post-independence epoch would become secondary to the exploration of what went wrong in Latin America during the phase of widespread catching up to the developed countries in regions of the Periphery (Southern Europe, East Asia)<sup>3</sup>.

My purpose in this paper is to re-assess the timing of Latin America's retardation, first, by using a more representative comparator such as a group of countries included today under the OECD acronym, and second, by resorting to the tools employed in the inequality literature<sup>4</sup>.

No systematic attempt has been made to assess international inequality over the long run except for François Bourguignon and Christian Morrisson (2002) and Peter Lindert and Jeffrey Williamson (2003) recent contributions<sup>5</sup>. Interestingly, Bourguignon and Morrisson (2002: 738) did not discuss the case of Latin America "because its economic growth over the last two centuries has roughly coincided with the world average". Inferences on long-run trends in inequality rest almost exclusively on GDP per head, at odds with the increasing challenge to GDP per head as a measure of welfare<sup>6</sup>. Different socio-economic indicators have been explored as an alternative to GDP per head amid

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<sup>3</sup> Cf. Alan Taylor (1998) for an exploration of the distortions underlying Latin America's distinctive behavior.

<sup>4</sup> I describe 'OECD', for short, a sample of today's advanced nations from Europe, the so called 'areas of new settlement' or Maddison's 'European offshoots' (Australia, Canada, and New Zealand), the U.S.A. and Japan.

<sup>5</sup> The prevailing view in the inequality literature is a growing disparity between rich and poor nations over the last two centuries, in which between-country inequality appears as the main determinant, although this view does not seem to hold for the late twentieth century.

<sup>6</sup> Income per head as a welfare indicator has been recurrently questioned since the spread of national accounts half a century ago (United Nations, 1954; Partha Dasgupta, 1993; Stanley Engerman, 1997), in spite of its advantage as a synthetic index and the observed association between economic growth and welfare (W.A. Lewis, 1955; Wilfred Beckerman, 1993).

strong criticism<sup>7</sup>. The United Nations Development Program's Human Development Index, published annually since 1990, is the latest addition. In this paper long-run trends in inter-country inequality are computed both for real income per head (that is, purchasing power adjusted GDP per head), and for an amended, 'improved' index of human development.

Among the main findings of the paper can be highlighted a long term rise in real per capita income inequality, that is mainly determined by the widening gap between OECD and Latin America. This result leads to the conclusion that contrary to a widespread belief, in terms of per capita income, Latin America fell behind during the late twentieth century. This finding is not confirmed, however, in terms of human development for which preliminary results suggest a drop in inter-country inequality over the long run. Yet, a large gap between OECD and Latin America still remained in 1990.

The paper is organized as follows: Section II discusses the indicators used to assess historical trends in economic inequality and presents new measures of long-run international inequality for OECD and Latin American GDP per head that can be, then, decomposed into the underlying changes in within and across regions' inequality. In section III an alternative welfare indicator to the conventional UNDP's index of human development is offered, from which new decomposable measures of long-run international inequality are derived. In the concluding section the issue of when did Latin America fall behind is reconsidered.

## ***II. Long-Run Inequality in Real Income***

### **Real income data**

In international comparisons, dissatisfaction with nominal income (that is, GDP per head in national currency converted into a common currency using the trading exchange rate) has led to an almost generalized use of real income (the conversion into a common currency is carried out with a purchasing power parity (PPP) exchange rate)<sup>8</sup>. Unfortunately, the construction of PPP converters involves high costs in terms of time and resources. Only PPPs for a restricted country sample that does not include any of Latin

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<sup>7</sup> Among them the Basic Needs Approach and the Physical Index of Quality of Life (PIQL). Cf. Irma Adelman and Cynthia Morris, 1967; Beckerman, 1966; Beckerman and Bacon, 1966; Eva Ehrlich, 1969; Heston, 1973; Hicks and Streeten, 1979; Larson and Wilford, 1979; M.D. Morris, 1979; Paul Streeten *et al.*, 1981; McGranahan *et al.*, 1985; Rati Ram, 1982.

<sup>8</sup> Empirical evidence gathered in recent years strongly rejects the conventional results obtained through the trading exchange rate converter (Summers and Heston, 1991; Bart van Ark, 1993). Trading exchange rates only reflect the purchasing power of goods traded internationally, and are influenced by capital movements, exchange controls and speculation (Maddison, 1995: 162). In other words, foreign exchange rates do not measure relative price levels and do not move with them overtime (Sultan Ahmad, 1998).

America have been constructed for earlier periods, and most of them for output components<sup>9</sup>.

An indirect method to derive historical estimates of real income levels for a large sample of countries is the backward projection of PPP-adjusted GDP per capita for a recent benchmark with volume indices (or growth rates) of product per head derived from national accounts data<sup>10</sup>. It is worth noting that fixed-base real (PPP-adjusted) product data represent a most convenient alternative to carrying out painstaking direct comparisons across space and time and have the presentation advantage that their growth rates are identical to those calculated from national accounts<sup>11</sup>. Alas, a distant PPP benchmark introduces distortions in inter-temporal comparisons since its validity depends on how stable the basket of goods and services used to construct the original PPP converters remains over time. As growth occurs over time the composition of output, consumption and relative prices all vary, and the economic meaning of comparing real product per head based upon remote PPPs becomes entirely questionable. Hence, using a single PPP benchmark for long-run comparisons implies a hardly realistic assumption: that no changes in relative prices (and, hence, no technological change) takes place over time.

Since PPP exchange rates were not computed directly for Latin American countries in 1990 (Maddison, 1995, 2001), I have resorted to a set of own-country weights (Paasche) PPP direct computations by Economic Commission for Latin America [ECLA] for 1960 (Braithwaite, 1968; ECLA, 1968) never used before in historical studies that provides a wider spatial coverage<sup>12</sup>. It is worth noticing that the frequently used 1970 benchmark, originally published by CEPAL [the Spanish acronym of ECLA] (1978) is just a projection of the 1960 benchmark levels with each Latin American country's inflation differential with

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<sup>9</sup> In addition to O'Brien and Keyder (1978) and Fremdling (1991) PPP computations for commodity output, there are sectoral PPP estimates: for agriculture, van Zanden (1991) and O'Brien and Prados de la Escosura (1992), and for manufacturing, Broadberry and Fremdling (1990), Broadberry (1994, 1997), Burger (1997) and Dormois and Bardini (1995). Exceptionally, Williamson (1995) used an income approach. Recently, Ward and Devereux (2003a, 2003b) have accepted the challenge to build direct PPP estimates from the expenditure side for twelve western economies at five benchmarks (1872, 1884, 1905, 1930, and 1950).

<sup>10</sup> Maddison (2003) 1990 Geary-Khamis dollar estimates provide the best example.

<sup>11</sup> A significant strand of the literature defends the view that the best estimates of growth rates are those obtained from national accounts (Bhagwati and Hansen (1973); Isenman (1980); Kravis and Lipsey (1991); Maddison (1991, 1995)) on the grounds that "using domestic prices to measure growth rates is more reliable, because those prices characterize the trade offs faced by the decision making agents" (Nuxoll (1994)). Kravis and Lipsey (1991:458) argued that growth rates derived from domestic prices were preferable because of the basket of goods used "reflected the preferences of purchasers of final product in one of the years being compared".

<sup>12</sup> The commodity basket included 261 consumption goods and 113 investment goods for capital cities in nineteen Latin American countries and the US (Houston and Los Angeles). Prices were collected in 1960/62. Quantity expenditure weights for a Latin American average and the US in 1960 were used (ECLA, 1968; Braithwaite, 1968). PPPs in ECLA (1960) appear, thus, to be superior in country coverage but not in commodity coverage to ECIEL benchmark estimates for 1970 and 1975 (Salazar-Carrillo, 1983; Salazar-Carrillo and Tirado de Alonso, 1988; Salazar-Carrillo and Prasad Rao, 1988).

the USA<sup>13</sup>. Alternatively, Geary-Khamis PPPs derived by the UN's International Comparisons Project [ICP] could have been used for most Latin American countries in 1980 (and, for all, in 1996). The choice of the 1960 benchmark obeys to two reasons: a) the possibility of employing GDP volume series expressed in US relative prices (derived with Paasche PPPs) that facilitated the comparison with available OECD countries' real (PPP-adjusted) income per head expressed in US relative prices (Prados de la Escosura, 2000) and b) that, in absence of current price PPP-adjusted GDP levels, real income at 1960 US prices provide a intermediate year for the time span considered and it is, hence, preferable to the use of a benchmark year for the end of the twentieth century<sup>14</sup>. A set of real product per head estimates, that includes Europe, the New World and Japan, has been constructed at 1960 US relative prices by projecting backwards with volume indices the ECLA (1968) benchmark for Latin America and my own one (Prados de la Escosura, 2000) for OECD countries<sup>15</sup>.

Graph 1 presents population-weighted averages of per capita incomes in OECD and Latin America<sup>16</sup>. It can be noticed that Latin America grew at roughly the same pace as the OECD average between 1850 and 1870 and above the average rate of growth in OECD countries between 1870 and 1913 (except when the three country sample, LA3, is considered), but slightly below it during the Interwar years and way below it after 1950 (and especially after 1980). The relative position of Latin America in terms of OECD GDP per head presents a wide U-shape for all country samples, except for LA3 (Graph 2). The improvement in Latin American relative income per capita from the late nineteenth century up to 1913 gave way, after stabilizing during the Interwar years, to a sharp decline in the second half of the twentieth century. A similar exercise comparing Latin America to the Anglo-Saxon New World (Canada, the USA, Australia and New Zealand), or to the richest top OECD countries, casts almost identical results.

However, when the comparison is carried out since 1850, for only three Latin American countries, the relative position of Latin America varies significantly, and two phases can be clearly depicted: a relative decline up to 1900, followed by a tendency to stabilize up to 1980. This long-run picture of Latin America based on a very limited country sample fits, nonetheless, the widespread perception of the nineteenth century as an

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<sup>13</sup> Astorga and Fitzgerald (1998), for example, use the CEPAL's 1970 projected benchmark.

<sup>14</sup> I am preparing new short-cut current price estimates of real income (at US relative prices) for Latin America that will be used in a next version of the paper.

<sup>15</sup> The sources for volume indices of GDP per head are provided in Appendix C.

<sup>16</sup> The number of countries included in each sample figures after the region's name, that is, LA6 means that six countries are included in this Latin American (LA) sample.

epoch of retardation in which Latin America fell behind. If the exercise is replicated for Latin America vis-à-vis the Anglo-Saxon New World (Australia, New Zealand, Canada, and the US), a similar pattern appears (Graph 2b). It is clear that a view that rests on such a reduced and biased country sample and that does not coincide with the robust view of Latin America's relative performance that derives from samples which include six or more countries, lacks significance. And, what about the decades between independence and mid-nineteenth century?. Latin America probably grew at a slower pace between 1820 and 1850 than thereafter, though lack of data prevents to carrying out a similar exercise to that for the post-1850 era. It can be said, however, that countries behave quite differently across Latin America: while Mexico seems to have experienced a decline in per capita income (Coatsworth, 1989; Salvucci, 1997), and that was probably also the case of Peru (Quiroz, 1993), Brazil suffered stagnation (Leff, 1982), as it seems to have been the case of Cuba (Fraile, Salvucci and Salvucci, 1993); Chile (Díaz et al, 1998), Venezuela (Baptista, 1997), most probably Argentina (Newland, 1998; Newland and Poulson, 1998) and, perhaps, Colombia (Jaramillo et al, 2001) improved their real income per head<sup>17</sup>. Thus, jumping to a definitive conclusion about an early, post-independence decline in Latin America is premature. Moreover, retardation could only be claimed if the comparator is reduced to a handful of North-Western European countries that experienced sustained per capita income growth prior to 1850 (Table A.1).

The high variance of growth rates of GDP per capita in Latin America is worth highlighting after 1870 (Graph 3). Argentina, Chile and Mexico income per head grew above Latin American and OECD averages between 1870 and 1913, Brazil, Colombia, Peru, and Venezuela did it over 1913-1938, but none did it after 1950 (although Brazil, Colombia, and Mexico grew above the Latin American average). As countries starting from lower income levels appear to have grown faster over the long run a pattern of convergence among Latin American nations is observed while they tend to diverge from the OECD average incomes (Graph 4).

To sum up, it appears that over the period considered that spans over two phases of globalization and one of de-globalization, Latin America does not seem to have fallen behind until the late twentieth century. Such a finding is in contradiction with conventional assessments that locates Latin American retardation in the nineteenth century.

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<sup>17</sup> In the case of Chile, Díaz et al. (1998) figures, suggest that real output per head grew at 1.8 percent between 1820 and 1850, while Baptista (1997) estimates point to an annual compound rate of 2.2 percent for real income per head between 1831/35 and 1851/55. As regards Mexico, estimates of annual decline in GDP per capita range from -0.5 percent for 1800-1845 (Coatsworth, 1989) to -0.2 percent (computed from figures in Díaz et al., 1989), for 1820-1850.

## Real income inequality

A more rigorous assessment of income inequality in Latin America and OECD is obtained with the comprehensive measures provided by entropy decomposable indices. Was inequality significantly larger for the international country sample that includes Latin America and OECD countries in 1990 than in 1870?, Were there different phases in inequality?, Was there, as suggested by Bourguignon and Morrison (2002), a sustained rise in inequality up to 1950 that tended to stabilize thereafter?, Did the gap between OECD (the Core) and Latin America (the Periphery) contribute to the increase in long-term inequality?, are pressing questions to which I will try to respond.

All measures of inequality among OECD and Latin America's countries are simultaneously provided for alternative country samples covering 1870-1990, 1913-1990, 1929-1990, and 1950-1990, respectively, with the more comprehensive samples covering a shorter time span, that allow to test the sensitivity of the results to changes in the sample's composition<sup>18</sup>. Only countries for which data on GDP actually exists are comprised in the sample<sup>19</sup>. Needless to say, the quality and coverage of the estimates show a large variance and usually fall as one goes back in time<sup>20</sup>.

Weighted measures of inequality (population-weighted, MLD, and income-weighted, Theil) for the four country samples of 'OECD' and Latin American countries are presented in Table 1<sup>21</sup>.

$$\text{MLD}_y = \sum p_i \ln (p_i/y_i) \quad [4]$$

$$\text{Theil}_y = \sum y_i \ln (y_i/p_i) \quad [5],$$

with  $p_i$  and  $y_i$  representing the shares of country  $i$  in total (OECD and Latin America) population and GDP. In addition to inequality levels, yearly rates of inequality reduction, in other words, the speed at which inequality falls (positive sign) or rises (negative sign), are shown at the bottom of each table.

A rise in per capita income inequality over the long run is observed for the Latin America and OECD sample (Graph 5)<sup>22</sup>. The increase in inequality is more intense when

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<sup>18</sup> The countries included for real income inequality estimates are listed in Appendix A.

<sup>19</sup> And no 'heroic' assumptions are introduced in an attempt to widen the geographical coverage of the sample.

<sup>20</sup> But no 'imaginative' solutions for missing countries, such as assuming identical levels of income or growth rates to their neighbors, are employed. Bourguignon and Morrison (2002) provide a good example of this: real income for missing Eastern European and non-European countries in the nineteenth century, for example, was interpolated with the growth rates of 'comparable neighboring countries'. Maddison (1995, 2001) also used this extrapolation procedure to expand his country's coverage.

<sup>21</sup> Mean Logarithmic Deviation (MLD) is also known as Bourguignon's L and Theil's population weighted index. Theil is short for Theil's income weighted index of inequality. Population shares in columns 4 and 5 provides an idea of each sample's coverage of Latin American countries.



measured with the MLD index, that gives more weight to changes at the bottom of the distribution. In addition, the wider the country coverage of the indices, the deeper inequality. A closer look reveals that, when measured with the MLD index, a moderate increase in inequality took place between 1890 and 1929. After a decline during the Depression years, the disruption brought about by World War II provoked a dramatic upsurge in inequality. Although inequality fell during the nineteen fifties, its level remained higher and relatively stable (and even increased slightly when the MLD index is used) until 1980, when a major rise occurred.

The years between 1870 and 1990 witnessed population and GDP growth to proceed with different intensity across countries. To what extent did the variance in their rates of growth have an impact on income inequality?. I have simulated the yearly rates at which, other things being equal, inequality would have fallen if all countries in the sample had enjoyed identical population (or per capita income) growth. The simulation exercise has been carried out for each of the three epochs in which the long century studied has been conventionally divided: the early phase of globalization of the late nineteenth century, the Interwar years of globalization backlash, and the post-World War II era of growth and globalization. The actual way of carrying out the simulation was to compute weighted inequality measures in which, *ceteris paribus*, population (or per capita income) remained unchanged over each epoch. This amounts to allocate identical growth rates to population (or per capita income) for all countries in the sample.

Table 2 offers the results of simulating what would have happened in our country sample had the variance of population (or income) growth been zero. They suggest that, in the late nineteenth and early twentieth century, differences in demographic expansion prevented an increase in inequality while, in the interwar, population and GDP growth acted as a counterbalance forces, and while income growth differentials provoked its decline, the variance in population growth slowed down the fall in inequality. Again, in the post-1950 years population growth variance was an obstacle to the reduction in inequality. It can be argued, therefore, that differentials in population growth, mostly stemming from Latin America's late demographic transition, represented an obstacle to reduce inequality in the 'OECD' and Latin America country sample during the 'short' twentieth century (1913-1990). Such a finding is in conflict with Bourguignon and Morrison (2002) contention that population growth rates are not associated with significant changes in world income distribution.

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<sup>22</sup> Alternative MLD and Theil indices are computed for country samples starting at different dates, thus, MLD1870 means that the computed MLD index covers from 1870 to 1990.

Another way to look at inequality trends is to decompose OECD and Latin America weighted inequality into the share attributable to distribution changes within each region and the share that stems from differences amongst regions. I have followed Theil (1979, 1989) in decomposing aggregate inequality into within-regions and between-regions inequality. ‘Within-regions’ inequality is obtained by adding up the results of weighting each region’s inequality measure (either MLD or Theil) by its population (income) share. ‘Between-regions’ inequality is, then, obtained as the difference between total (OECD and Latin America) inequality and the computed ‘within-regions’ inequality.

In Graphs 6A and 6B it is noticeable that ‘between-regions’ inequality, that is, between ‘OECD’ and Latin America, experienced a sustained rise since the 1920s, after the flat trend prior to World War I, while a declining trend (but for the post-World War II) is exhibited in ‘within-regions’ inequality. The deepening gap between ‘OECD’ and Latin America constitutes, hence, the main element underlying the observed increase in overall inequality (Graph 5).

When inequality within each region is examined, two clear trends emerged in Latin America: a steep rise prior to 1914, followed by a sustained decline over the ‘short’ twentieth century (1914-1990), with the result of lower inequality levels than in the late nineteenth century (Graphs 7A and 7B). The long-run fall in twentieth century inequality is, no doubt, conditioned by Argentine’s collapse in its international position. OECD exhibits a sustained decline in inequality only interrupted by World War II and its aftermath.

To sum up, the long-run increase in inequality is mainly due to the widening gap between average incomes between OECD and Latin America that peaked in the late twentieth century. It is then when Latin America appears to have fallen behind.

### **III. Long-Run Inequality in Human Development**

Income per head is just one dimension of material well-being and social scientists have been looking at inequality of welfare indicators. Increasing levels of inequality in lifetime income, resulting from combining trends in income with those in life expectancy, peaked in 1950 to stabilize and, even, to converge, thereafter, according to Bourguignon and Morrison (2002). The view that standards of living converged in the late twentieth century has been disputed by Hobijn and Franses (2001) on the basis of Kakwani (1993) ‘achievement indices’<sup>23</sup>.

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<sup>23</sup> Hobijn and Franses (2001) weight countries by their size (population or income), in contrast to the inequality literature (but along the convergence literature).

In this section of the paper inequality is measured in terms of an improved version of the UNDP's human development index.

### **The Human Development Index**

The Human Development Index [HDI] complements more conventional measures of welfare such as *per capita* income or consumption adding a new dimension to our knowledge of material progress over time<sup>24</sup>.

As a synthetic measure of Human Development, the HDI captures a country's achievements in longevity, knowledge and living standards through various indices: the relative achievement in life expectancy at birth, in education and in "all dimensions of human development not reflected in a long and healthy life and in knowledge" for which (the logarithm of) *per capita* GDP is a surrogate (UNDP, 2001: 240). The rationale for using the log of per capita income, that implies diminishing marginal utility of income, is that a decent standard of living does not require unlimited income<sup>25</sup>.

Indices for each dimension are computed according to the following formula,

$$\text{Dimension Index} = (x - Mo) / (M - Mo), \quad [1]$$

where **x** is the observed value of a given dimension of welfare, and **Mo** and **M** represent the maximum and minimum values, or goalposts.

Goalposts representing levels not reached yet and below the present's lowest level, respectively, have been chosen for each indicator in UNDP's HDI in order to make comparisons over time feasible. For life expectancy at birth the maximum and the minimum values are established at 85 and 25 years, respectively. For education, the maximum and minimum are 100 and 0. The education index combines adult literacy and gross enrolment (primary, secondary and tertiary), with two-thirds and one-third weights, respectively. In the case of *per capita* GDP, the maximum and minimum values are the logarithms of 40,000 and 100 dollars, respectively. The performance of each dimension ranges between 0 and 1. Then, the UNDP's HDI is obtained as the unweighted arithmetic average of the three dimension indices.

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<sup>24</sup> Human Development was originally defined as "a process of enlarging people's choices" that enables them "to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living" (United Nations Development Programme [UNDP], 1990: 10). Human capability, the doctrinal basis for human development, focuses on "the ability of human beings to lead lives they have reasons to value and to enhance the substantive choices they have" (Sen, 1997), as opposed to the concept of human capital, that augments production possibilities through skills and knowledge. For historical estimates, cf. Crafts (1997, 2002).

<sup>25</sup> This transformation of income introduced in 1999, had already been recommended by Sagar and Najam (1998: 254). Unhappiness with the earlier formula is discussed, among others, by Gormley (1995). Astorga, Berges and Fitzgerald (2004) depict the use of the marginal utility notion as arbitrary.

The reactions to non-conventional indicators of well-being have always been critical as regards their economic meaning, lack of welfare economic foundations and method of computation (Srinivassan, 1994; Dowrick, Dunlop and Quiggin 2003). The choice of HDI's components and its combination into a single index has provoked an endless debate. Main issues are whether HDI components (longevity, education and income) provide different insights of welfare or are just redundant (McGillivray, 1991). If they capture different welfare dimensions, then, should equal and fixed weights be allocated to each component of human development over time?<sup>26</sup> And is an arithmetic average the right procedure to combine the three dimensions into the HDI? Finally, is a linear transformation the best way to obtain non-income dimensions of human development from original values of education and life expectancy?<sup>27</sup>

I have constructed a new index of human development that takes into account assessments of the UNDP's HDI and suggestions for its improvement<sup>28</sup>.

I have followed Kakwani's axiomatic approach to transform the original values of non-income variables into their human development dimensions. Kakwani constructed a normalized index from an achievement function in which an increase in the standard of living of a country at a higher level implies a greater achievement than had it been the case if it took place at a lower level (Kakwani, 1993: 308)<sup>29</sup>. The proposed achievement function is, following Atkinson (1970),

$$f(x, Mo, M) = ((M - Mo)^{1-\varepsilon} - (M - x)^{1-\varepsilon}) / ((M - Mo)^{1-\varepsilon}), \quad \text{for } 0 < \varepsilon < 1 \quad [2]$$

where,  $x$  is an indicator of a country's standard of living, and  $M$  and  $Mo$  are the maximum and minimum values, respectively.

The achievement function is a convex function of  $x$ , and it is equal to 0, if  $x = Mo$ , and equal to 1, if  $x = M$ , ranging, then, between 0 and 1.

In the case favored by Kakwani's axiomatic approach,  $\varepsilon$  takes a value of 1, turning into,

$$f(x, Mo, M) = (\log(M - Mo) - \log(M - x)) / (\log(M - Mo)), \quad [3]$$

where  $\log$  stands for the natural logarithm.

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<sup>26</sup> Cf. Kakwani (1993), Aturupane, Glewwe and Isenman (1994) and Dasgupta and Weale (1992).

<sup>27</sup> An additional worry derives from the fact that the HDI combines stock and flows variables (Aturupane, Glewwe and Isenman, 1994: 246).

<sup>28</sup> Prados de la Escosura (2004a). I have computed two sets of human development indices: the conventional UNDP HDI and the 'improved' HDI. The 'improved' HDI represents an alternative to conventional UNHDI that, in my view, fits better the Human Development Reports' approach as this usually highlights the differences between Core and Periphery countries.

<sup>29</sup> For example, in the case of longevity, "a further increase must be regarded as a greater achievement than an equal increase at lower levels of longevity,  $f(x, Mo, M)$  must be a convex function of  $x$ , i.e., the achievement must increase at a faster rate than the longevity" (Kakwani, 1993: 313).

It should be noticed that the UNDP's HDI represents a particular case in which  $\varepsilon = 0$ , yielding expression [1] for each social dimension of the index<sup>30</sup>.

In the new, 'improved' HDI [IHDI], while social dimensions are derived with a convex achievement function (that is, using expression [3]), income's diminishing returns transformation is maintained (and, consequently, the logarithmic transformation of per capita income is employed). In addition, a geometric average has been employed to combine its three main dimensions (longevity, knowledge, and income) into the new IHDI<sup>31</sup>.

A minor additional change has been introduced in the goalposts for life expectancy at birth, where 80 years has been taken as its maximum and 20 years as its minimum. The reason for reducing them is that goalposts represent levels above and below the highest and lowest exhibit by the group of countries and, in our sample, the maximum and minimum values for life expectancy, are 78.8 and 24, respectively<sup>32</sup>.

The 'improved' human development indices have been computed with the real (PPP-adjusted) GDP per capita at 1960 US relative prices used in the income inequality estimates. Lack of data for Latin America forced me to compute one of the HDI attributes, education attainment, with literacy instead of combining literacy (2/3) and primary, secondary and tertiary enrolment (1/3). As a result the inequality estimates are downward biased as one moves close to the present since literacy rates have become universal, in particular, for 'OECD' countries<sup>33</sup>. Moreover, for the same reasons neglecting enrolment rates will possibly bias upwards the human development index for Latin America in the late twentieth century.

Population-weighted average levels of human development in OECD and Latin America are offered in Graph 8. Human development in Latin America is systematically lower than those in the OECD countries (Table A.2). Nonetheless, human development improved in Latin America faster than in the OECD and, consequently, the gap between the two regions fell in the long run (Graph 9), in clear contrast with Latin American relative

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<sup>30</sup> This particular case does not satisfy, however, one of the axioms of the achievement index defined by Kakwani: that the index should give greater weight to the improvement of a country which has higher level for each social indicator.

<sup>31</sup> It should be bear in mind that a geometric average of the index's components has the advantage of reducing their substitutability significantly, somehow avoiding that an improvement in one attribute may offset a worsening in another, with a resulting neutral aggregate effect on the HDI.

<sup>32</sup> Both Dasgupta (1990) and Kakwani (1993) used 80 years as the maximum goalpost for life expectancy at birth in present time developing countries. Life expectancy in some late nineteenth century Latin American countries was less than 25 years (Astorga and Fitzgerald, 1998). The sources of the social components of the human development index: life expectancy, literacy and enrolment are provided in Prados de la Escosura (2004).

<sup>33</sup> In a next version of the paper, the education attainment measure will include literacy and enrolment rates.

performance in terms of per capita income (Graph 2). Two periods, 1890-1913 and 1938-60 appear as the phases of more intense catching-up, with a weakening in the last decade, especially the 1980s.

A high variance is observed in human development performance across Latin America (Graph 10). Argentina and Mexico experienced improvements in human development above Latin American average before 1913, while in the Interwar years Mexico and Venezuela took the lead. After World War II these countries were joined by Brazil, Colombia and Peru. Thus, countries with lower levels of human development exhibit more intense improvement with the result of a reduction in the dispersion of welfare across Latin America over time. Yet, the gap between countries in the Southern Cone and the rest was not negligible in 1990, with the former in middle level of human development and the latter in the lower level (Graph 11)<sup>34</sup>.

### **HDI Inequality**

The same formulae used to measure income inequality have been employed, with ‘improved’ HDI and per capita income considered analogously,

$$MLD_b = \sum p_i \ln (p_i/b_i) \quad [6]$$

$$Theil_b = \sum b_i \ln (b_i/p_i) \quad [7],$$

with  $p_i$  and  $b_i$  representing the shares of country  $i$  in total (‘OECD’) population and human development (HDI times population).

Table 3 provides inequality estimates for ‘OECD’ and Latin America for the hundred years after 1890. In the long run, human development inequality, driven by literacy and life expectancy, fell, a result clearly at odds with the rise found for real income inequality. The steady fall in inequality that took place in the pre-World War I and the post-World War II years, the 1950s, in particular, account for it (Graph 12). It is worth noticing the discrepancies between the Theil index, that gives more weight to the upper part of the distribution, and the MLD index, that allocates more weight to the lower part. In terms of the Theil index inequality increased in the Interwar and in the 1980s, while it remained unchanged in terms of the MLD index.

If we now decompose OECD and Latin America weighted inequality into the share attributable to distribution changes within each region and the share that stems from differences amongst regions, it appears that ‘within-regions’ inequality dominates the long run decline in observed (Graphs 13A and 13B). Inequality plummeted both within the

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<sup>34</sup> In UNDP standard classification, lower represents below 0.5, while middle, between 0.5 and 0.8. It should be borne in mind that in the improved HDI a country level tends to be below the one in the conventional UNDP, HDI

‘OECD’ and within Latin America (Graphs 14A and 14B), but while a sustained fall occurred in the ‘OECD’, an upsurge of inequality up the Great Depression was followed in Latin America by a sharp contraction until 1960 that softened or stabilized thereafter depending on whether the MLD or the Theil index is used.

In sum, while overall inequality fell significantly over the long run, the gap between OECD and Latin America only experienced a relatively moderate reduction since it tended to stabilize after 1960 (and even to reverse after 1980, according to the Theil index).

#### ***IV. Concluding Remarks***

In this preliminary attempt to identify when did Latin America fall behind and how the gap between the Core (OECD) and the Periphery (Latin America) has evolved over time, some tentative results can be offered:

A long term rise in real per capita income inequality for a partial sample of the world that includes Latin America and OECD countries is noticed. This finding contradicts the benign view of a rise in inequality up to the mid-twentieth century that stabilized thereafter proposed by Bourguignon and Morrison (2002). National differences in population growth, largely a consequence of the late demographic transition in Latin America, held up a fall in inequality during the ‘short’ twentieth century (1913-1990).

The deepening gap between OECD and Latin America was the major factor beneath the observed increase. This result provides, at least, a tentative answer to the question of when did Latin America fall behind. Contrary to a widely held view, Latin America’s retardation vis-à-vis OECD countries appears to be a (late) twentieth century phenomenon<sup>35</sup>. Moreover, the decline that probably took place in the decades after independence seems hardly comparable to the dramatic fall that took place in Latin America’s relative position to the OECD in the late twentieth century.

Aggregate inequality in human development fell in the long run, a result of relative achievements in education and life expectancy in Latin America, especially during the central decades of the twentieth century. Yet a large gap between the ‘OECD’ and Latin America did remain in 1990.

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<sup>35</sup> Of course, only the post-1850 era is analyzed here but similar results appear when the scope is widened both in time and regional coverage. Cf. Prados de la Escosura (2004b).

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## **Appendix A**

### ***Countries included in 'OECD' and Latin America's GDP sample since 1870.***

Australia (Core)  
Austria (Periphery)  
Belgium (Core)  
Canada (Core)  
Denmark (Core)  
Finland (Periphery)  
France (Core)  
Germany (Core)  
Greece (Periphery)  
Ireland (since 1913) (Periphery)  
Italy (Periphery)  
Japan (Periphery)  
Netherlands (Core)  
New Zealand (Core)  
Norway (Core)  
Portugal (Periphery)  
Spain (Periphery)  
Sweden (Core)  
Switzerland (Core)  
Turkey (since 1913) (Periphery)  
UK (Core)  
USA (Core)  
Argentina (Periphery)  
Bolivia (since 1950) (Periphery)  
Brazil (Periphery)  
Chile (Periphery)  
Colombia (since 1913) (Periphery)  
Costa Rica (since 1929) (Periphery)  
Dom. Rep. (since 1950) (Periphery)  
Ecuador (since 1950) (Periphery)  
El Salvador (since 1929) (Periphery)  
Guatemala (since 1929) (Periphery)  
Haití (since 1950) (Periphery)  
Honduras (since 1929) (Periphery)  
México (Periphery)  
Nicaragua (since 1929) (Periphery)  
Panama (since 1950) (Periphery)  
Paraguay (since 1950) (Periphery)  
Peru (since 1913) (Periphery)  
Uruguay (Periphery)  
Venezuela (Periphery)



## **Appendix B**

*Countries included in 'OECD' and Latin America's HDI sample since 1890.*

Australia  
Austria  
Belgium  
Canada  
Denmark  
Finland  
France  
Germany  
Greece  
Ireland (since 1913)  
Italy  
Japan  
Netherlands  
New Zealand  
Norway  
Portugal  
Spain  
Sweden  
Switzerland  
Turkey (since 1913)  
UK  
USA  
Argentina  
Bolivia (since 1950)  
Brazil  
Chile (since 1900)  
Colombia (since 1913)  
Costa Rica (since 1929)  
Dom. Rep. (since 1950)  
Ecuador (since 1950)  
El Salvador (since 1929)  
Guatemala (since 1929)  
Haití (since 1950)  
Honduras (since 1929)  
Mexico  
Nicaragua (since 1929)  
Panama (since 1950)  
Paraguay (since 1950)  
Peru (since 1950)  
Uruguay (since 1900)  
Venezuela (since 1900)

## Appendix C

### *Sources for GDP per Capita Volume Indices for 'OECD' and Latin America*

GDP volume or quantity indices for OECD countries come from the national sources stated below or from Maddison (2003). Population figures are taken mainly from Maddison (2003), Mitchell (1992, 1993, 1994), and the League of Nations and UN Yearbooks, unless stated in the national sources below. Data on Latin American GDP and population in the twentieth century are provided by P. Astorga, A. R. Bergés, and E.V.K. FitzGerald (2004), *The Oxford Latin American Economic History Database (OxLAD)*, The Latin American Centre, Oxford University, <http://oxlad.thedesignfly.net/>

**Argentina.** Cortés Conde (1997) for 1875-1935. I estimated the level for 1870 by backward projection of the 1875 level assuming the rate of growth for 1870-1875 was identical to that of 1875-1880.

**Austria.** Imperial (Habsburg) Austria: 1830-1870, Kausel (1979); 1870-1913, Schulze (1997). Modern (Republic of) Austria's level for 1913 was derived by applying Good's (1994) ratio (1.346) to Schulze's Imperial estimates.

**Belgium.** 1830-1913, Horlings (1997); 1925-1938, average of GDP estimates from Buyst (1997) (income and expenditure approaches) and Horlings (1997) (output).

**Brazil.** 1850-1980, Goldsmith (1986).

**Canada.** 1850-1860, Firestone (1960); 1870-1926, Urquhart (1986). Although Urquhart seems to favor GNP, GDP was preferred to GNP here.

**Chile.** 1820-1990, Díaz, Lüders and Wagner (1998).

**France.** 1830-1990, Toutain (1997).

**Finland.** 1860-1990, Hjerpe (1994).

**Germany.** 1850-1900, Hoffmann (1965); 1900-1950, Spoerer (1997) and Ritschl and Spoerer (1997). 1850-1900, GNP at market prices was obtained by re-scalating NNP with the GNP/NNP ratio for 1901-13, from Spoerer (1997). 1850-1913, GDP at market prices was computed from the GNP estimates and from data on net factor payments abroad taken from Hoffmann (1965) and Ritschl (1991). West Germany figures since 1950 include the Saar and West Berlin and figures for West Germany in 1950-55 had to be re-scaled by 8.6 per cent.

**Greece.** 1860-1938, Kostelenos (1995).

**Ireland.** 1913, computed by applying the Republic of Ireland/Ireland ratio in Kennedy (1995, Table 2) to Ó Gráda's (1994) estimates for all Ireland. Republic of Ireland, Kennedy (1971) for 1929-1960.

**Japan.** 1890-1938, Ohkawa and Shinohara (1979).

**Netherlands.** 1870-1913, Smits, Horlings and van Zanden (1997), average of expenditure, income, and output estimates; 1925-1938, den Bakker, Huitker and van Bochove (1990).

**Norway.** 1835-1913, Hodne and Grytten (1994).

**New Zealand.** Rankin (1992), 1870-1938.

**Portugal.** 1870-1910, Lains (1995); 1910-1955, Batista, Martins, Pinheiro and Reis (1997); 1955-1990, Pinheiro (1997).

**Spain.** Prados de la Escosura (2003), 1850-1990.

**Sweden.** Krantz (1997), 1820-1990.

**Turkey.** 1913-1938, Private communications by Sevkett Pamuk which derive from Ozel (1997), and Pamuk (1998).

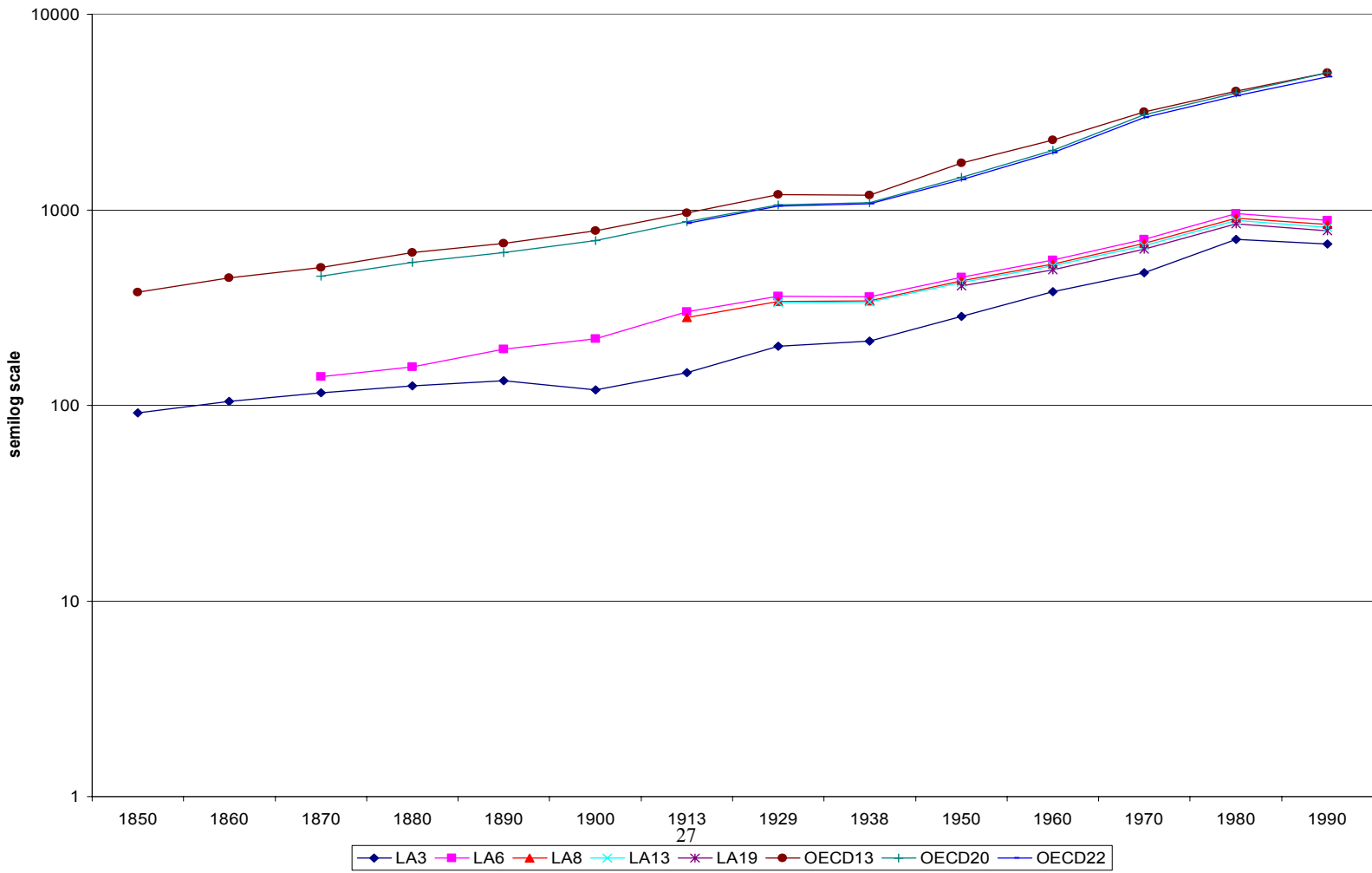
**United Kingdom.** 1830-1990, Mitchell (1988).

**USA.** 1820-1860, David (1996), "narrow" estimates at constant prices, which coincides with Weiss (1994) "conventional estimate" for 1840-1860. 1870-1929, Balke and Gordon (1989).

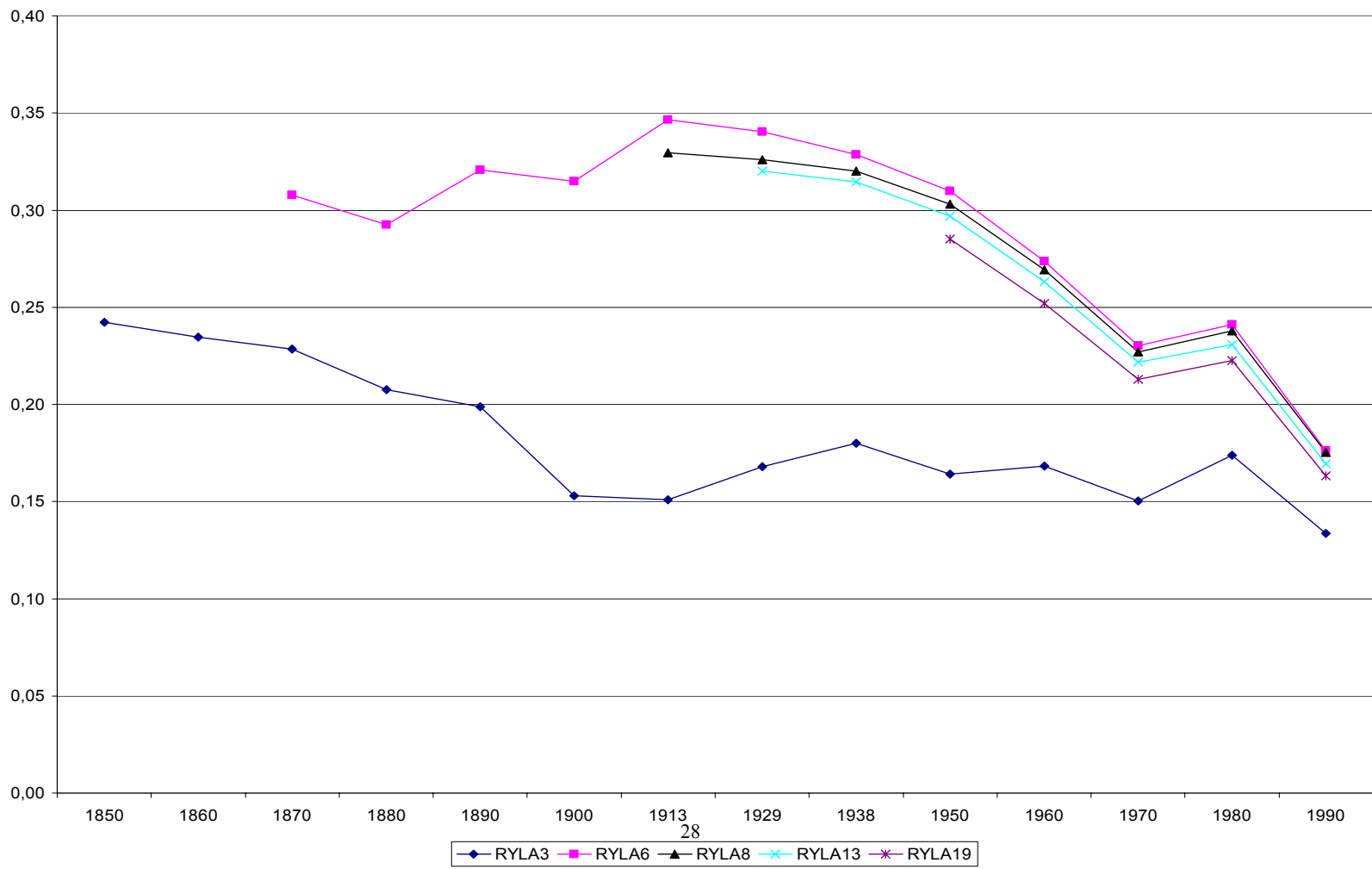
**Uruguay.** Bértola (1998), 1870-1929.

**Venezuela.** Baptista (1997), 1830-1990.

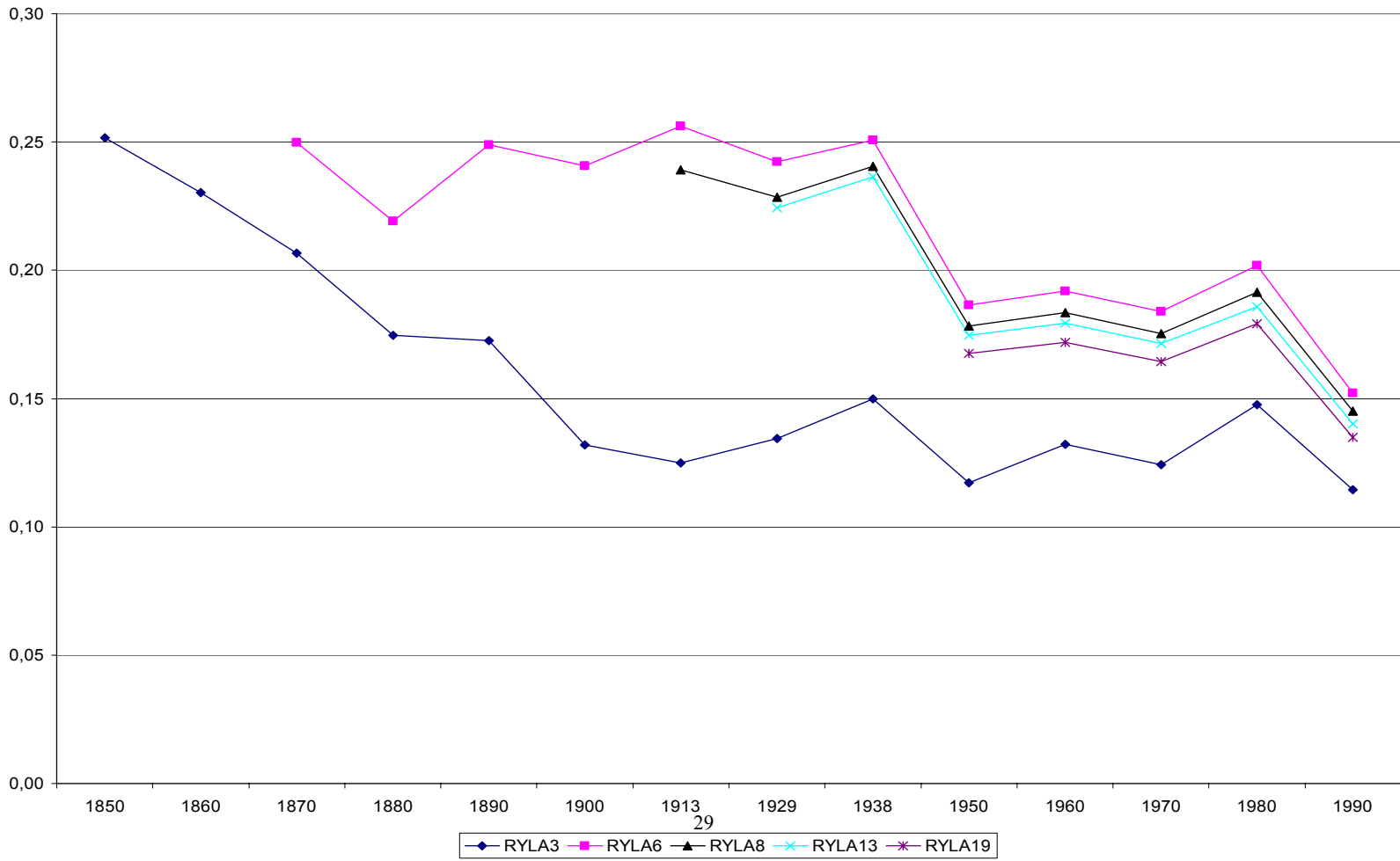
Graph 1. Real GDP per Capita in OECD and Latin America, 1850-1990 (1960 US Relative Prices)



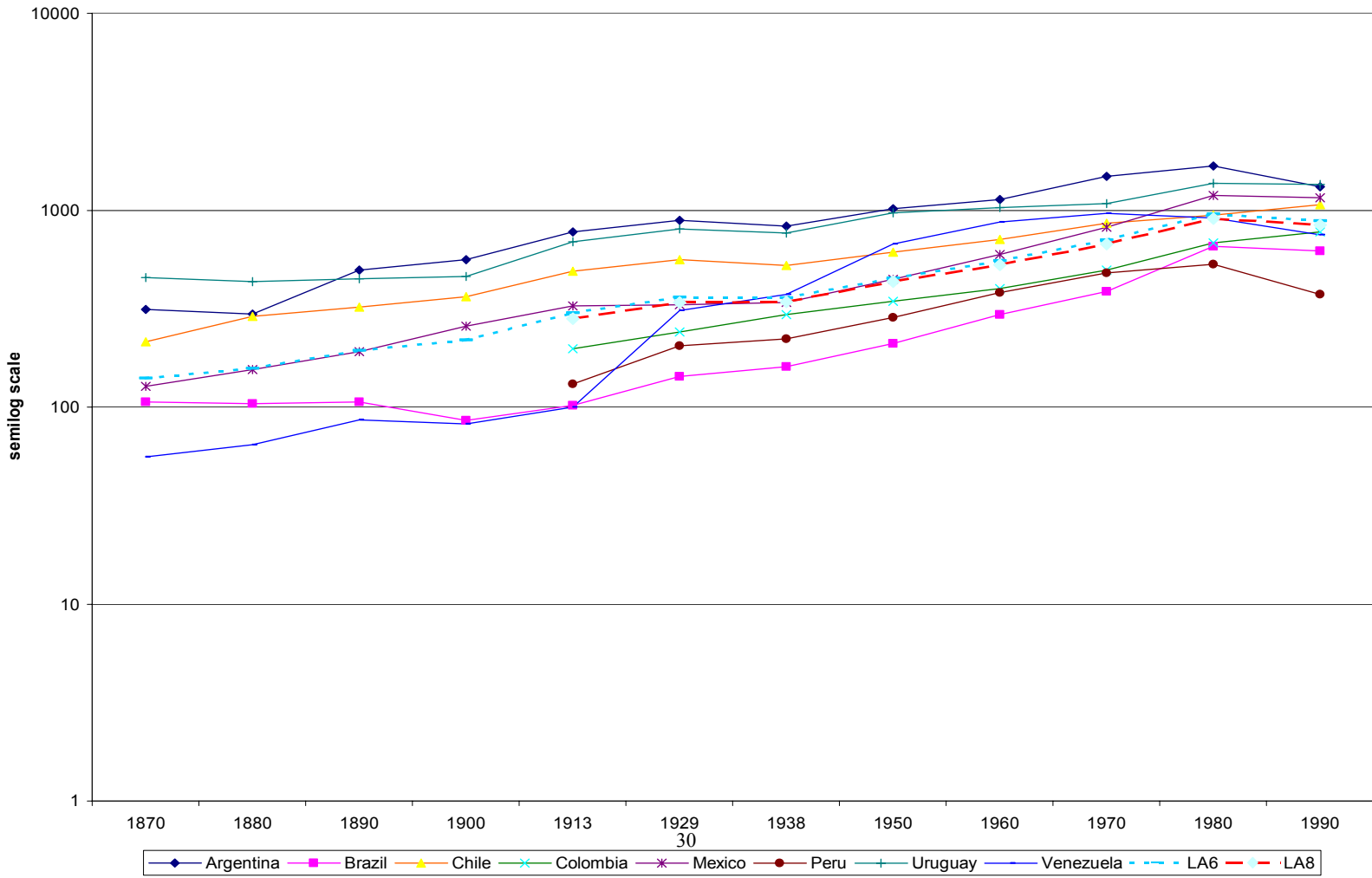
Graph 2A. Relative Real GDP per Capita in Latin America, 1850-1990 (OECD = 1) (1960 US Relative Prices)



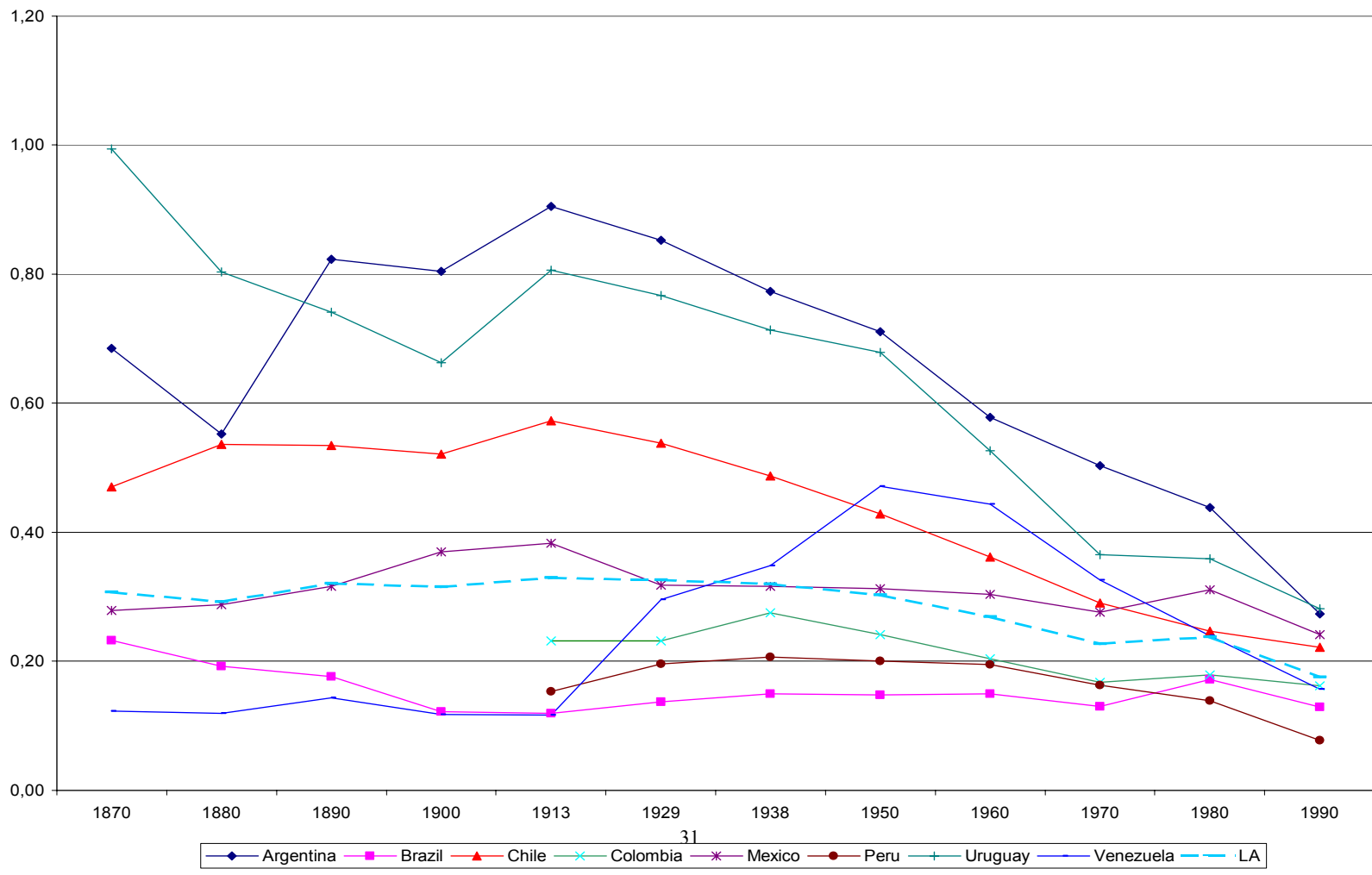
**Graph 2B. Relative Real GDP per Capita in Latin America, 1850-1990 (Anglo New World = 1)  
(1960 US Relative Prices)**



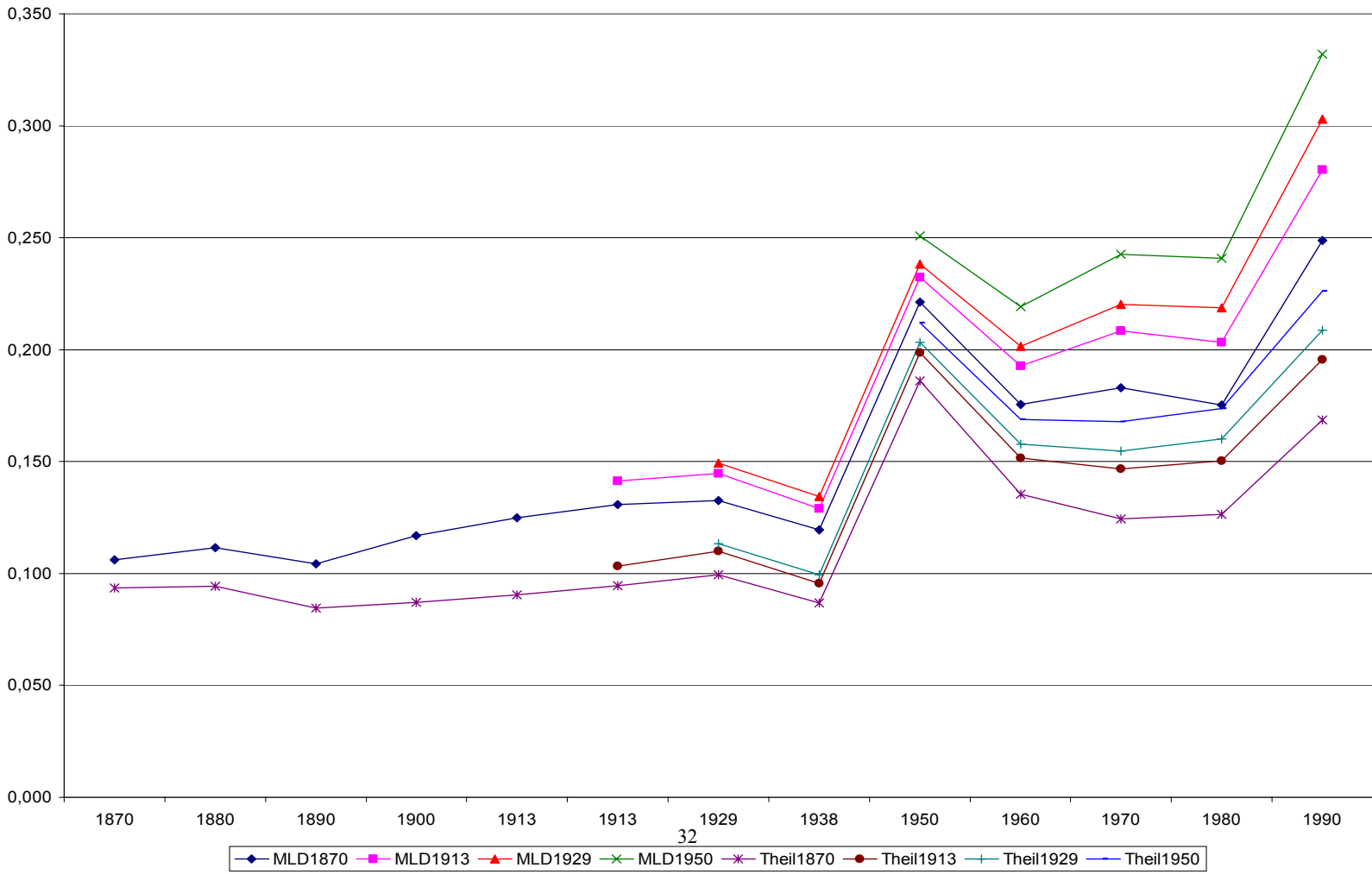
**Graph 3. Real GDP per Capita in Eight Latin American Countries (1960 US Relative Prices)**



Graph 4. Relative Real GDP per Capita in Eight Latin American Countries (OECD = 1) (1960 US Relative Prices)

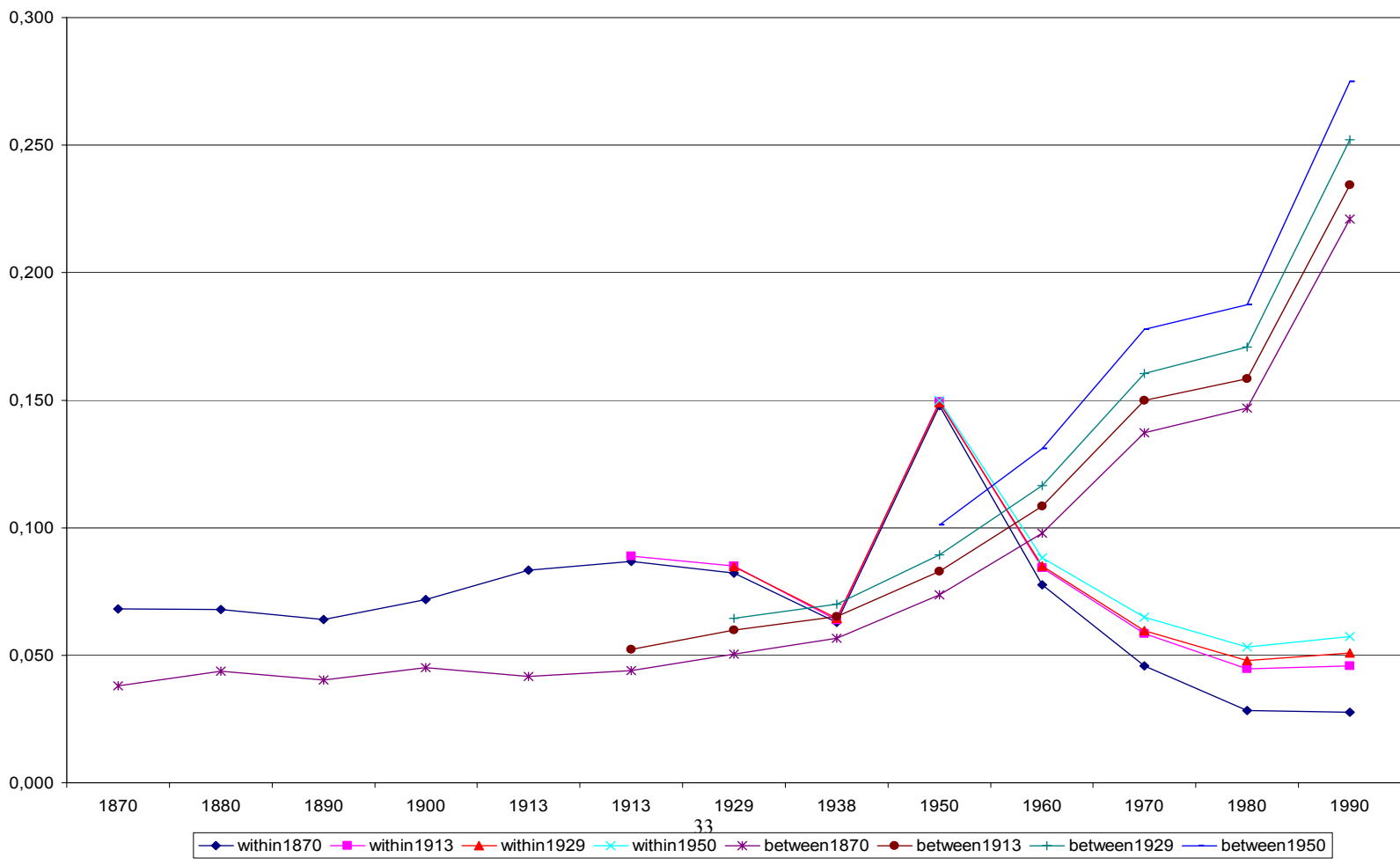


**Graph 5. Per Capita Income Inequality in Latin America and OECD (1960 US Relative Prices)**

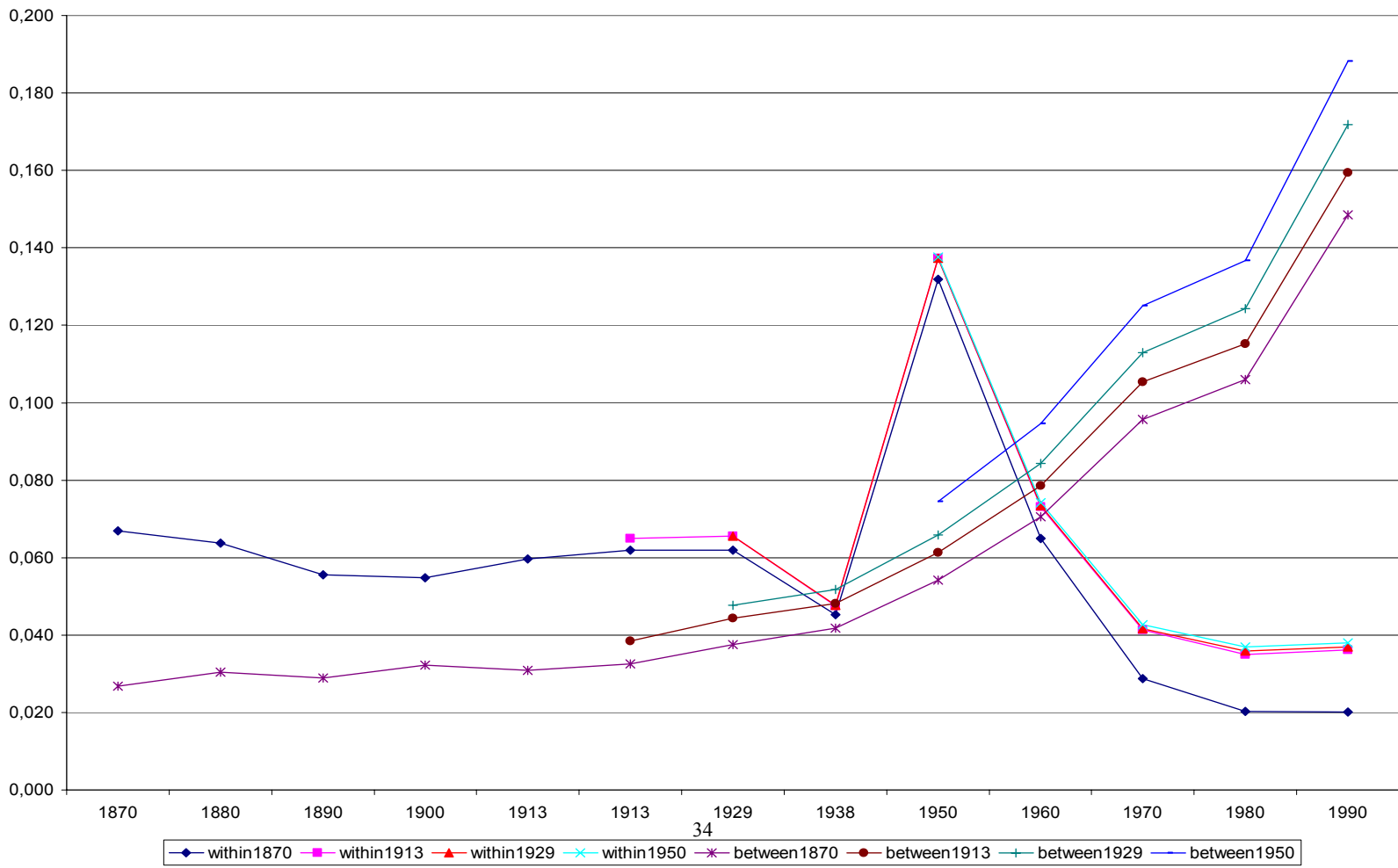




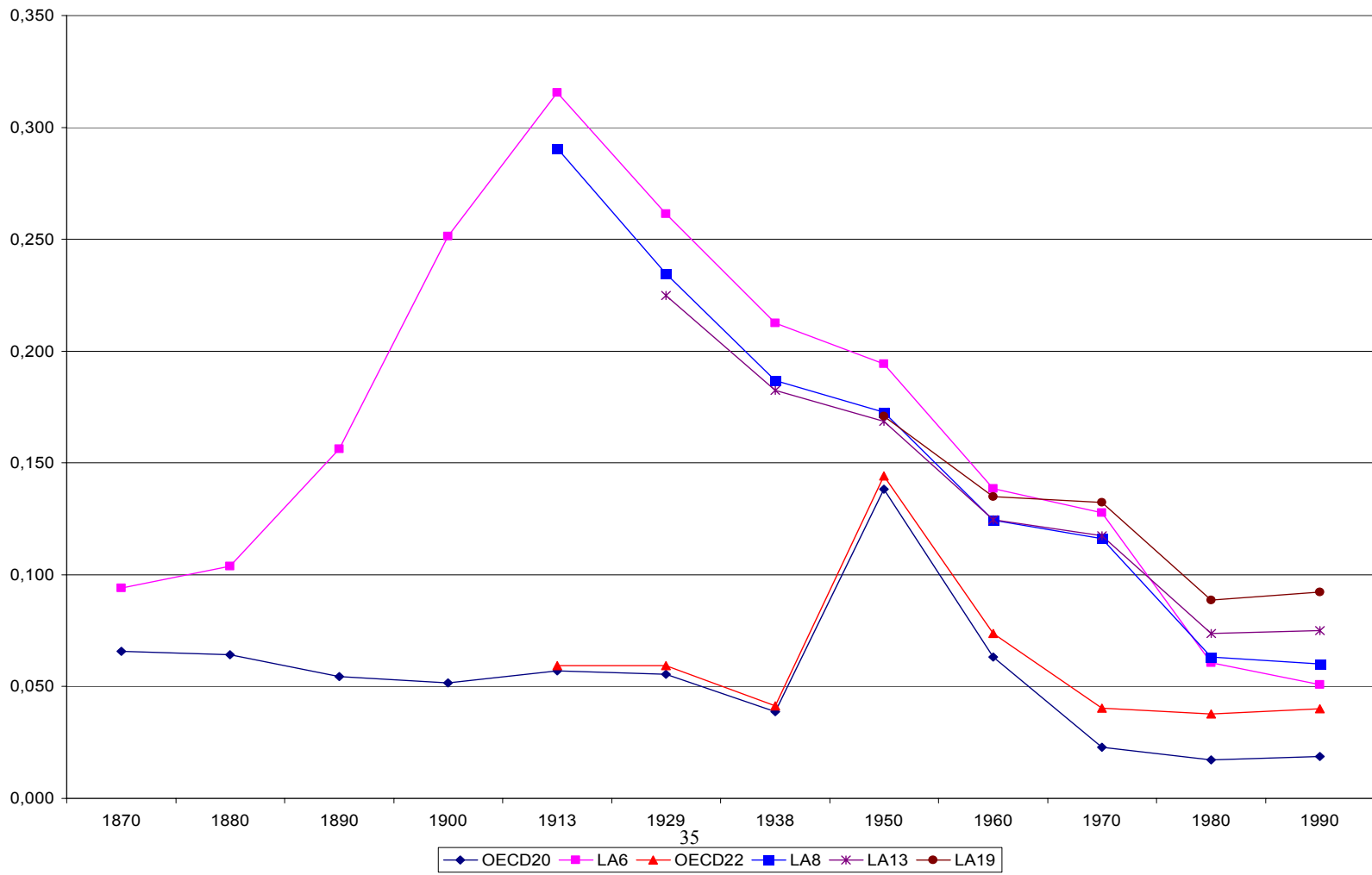
**Graph 6A. Within-regions and Between-regions Income Inequality in OECD and Latin America (MLD)  
(1960 US Relative Prices)**



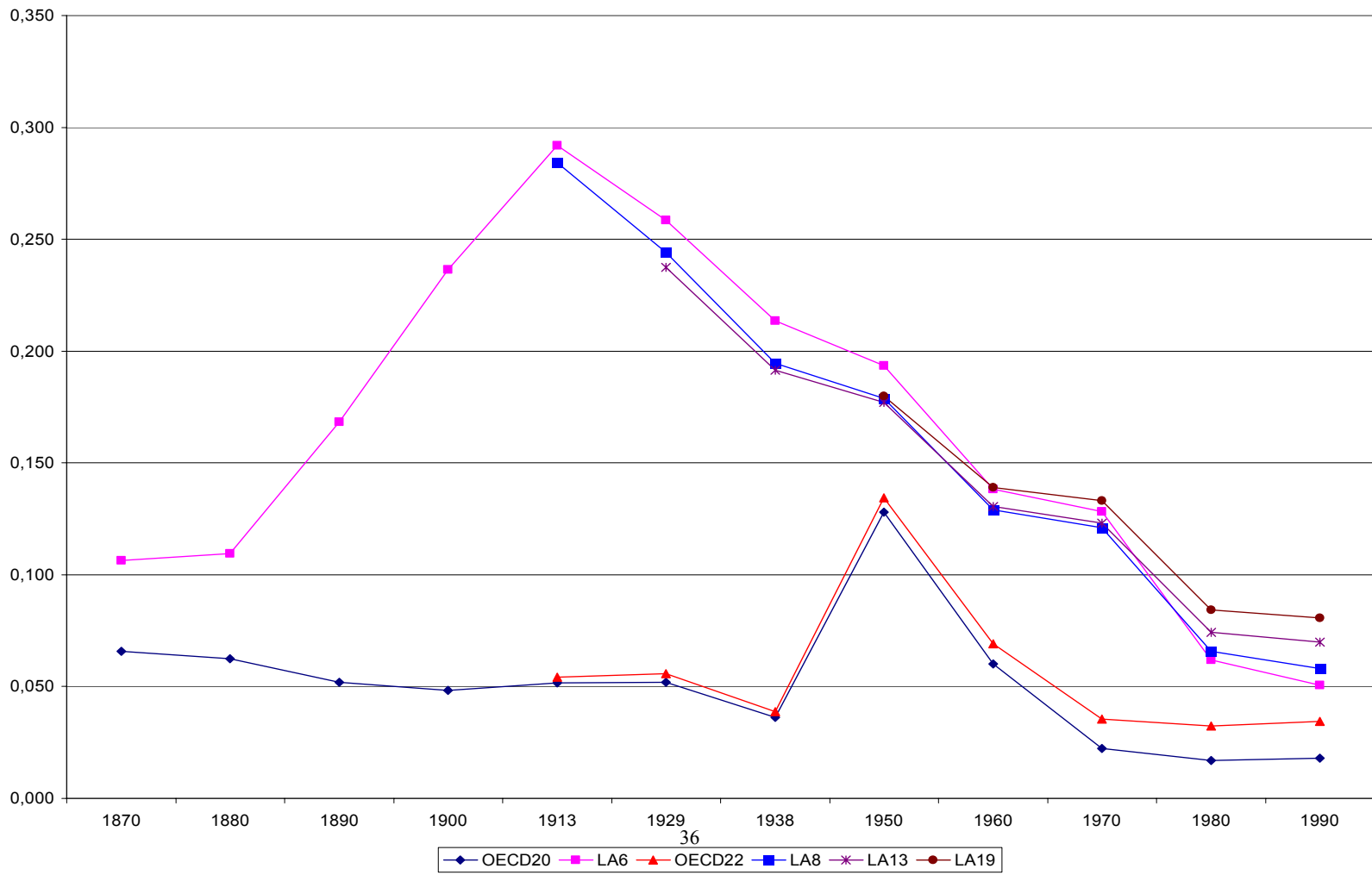
**Graph 6B. Within-regions and Between-regions Income Inequality in OECD and Latin America (Theil)  
(1960 US Relative Prices)**



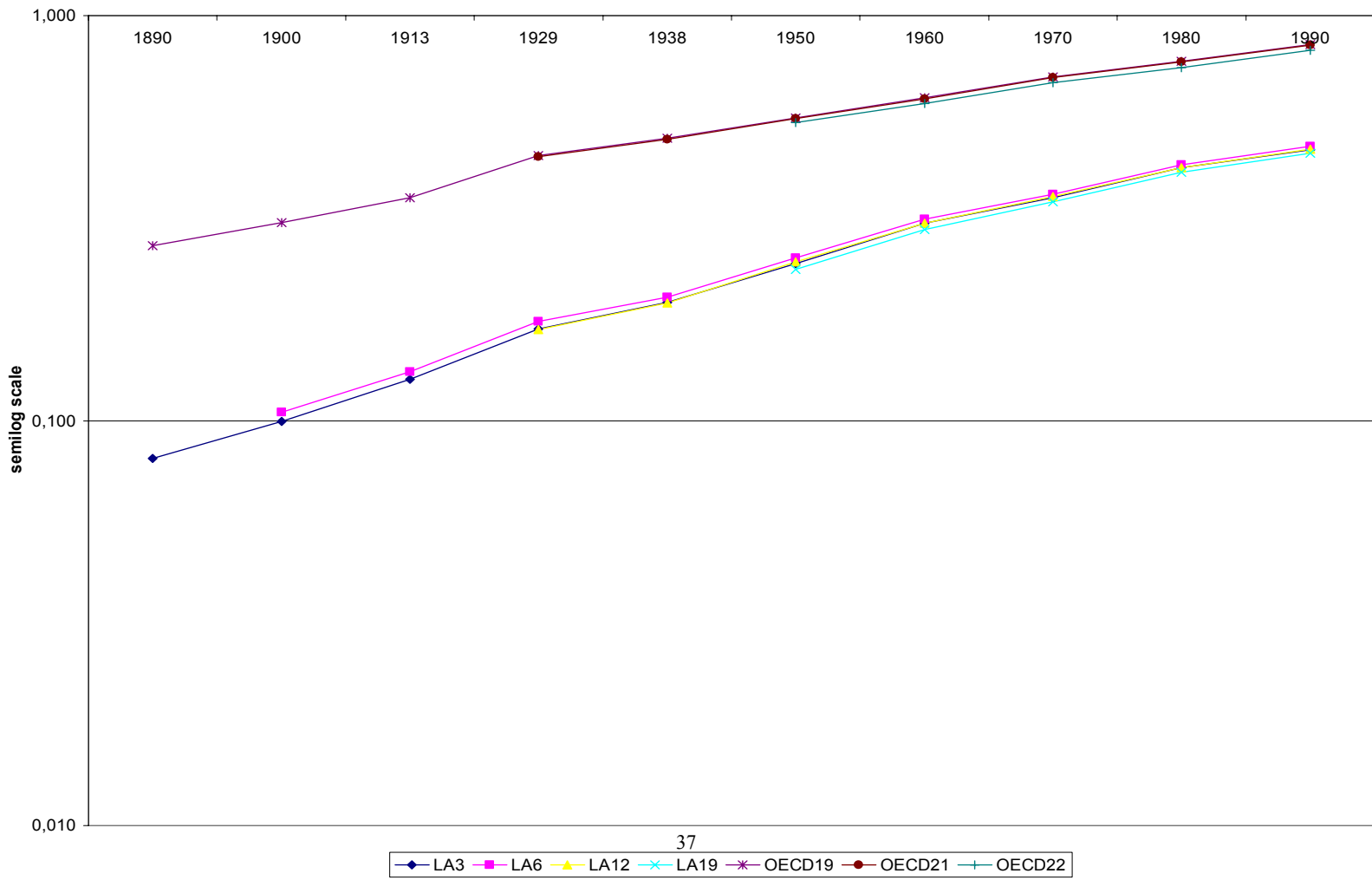
**Graph 7A. Income Inequality within OECD and Latin America (MLD) (1960 US Relative Prices)**



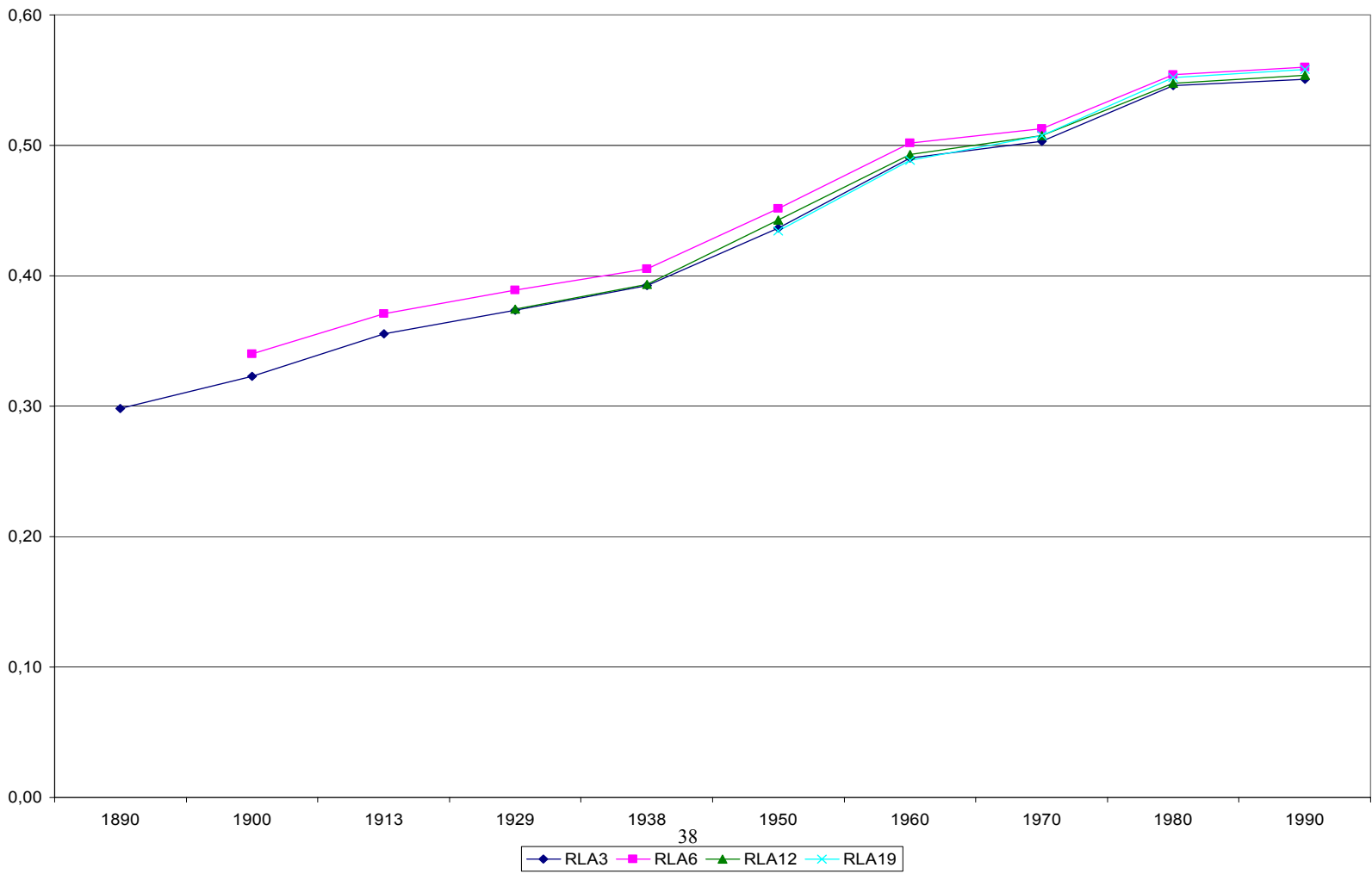
**Graph 7B. Income Inequality within OECD and Latin America (Theil) (1960 US Relative Prices)**



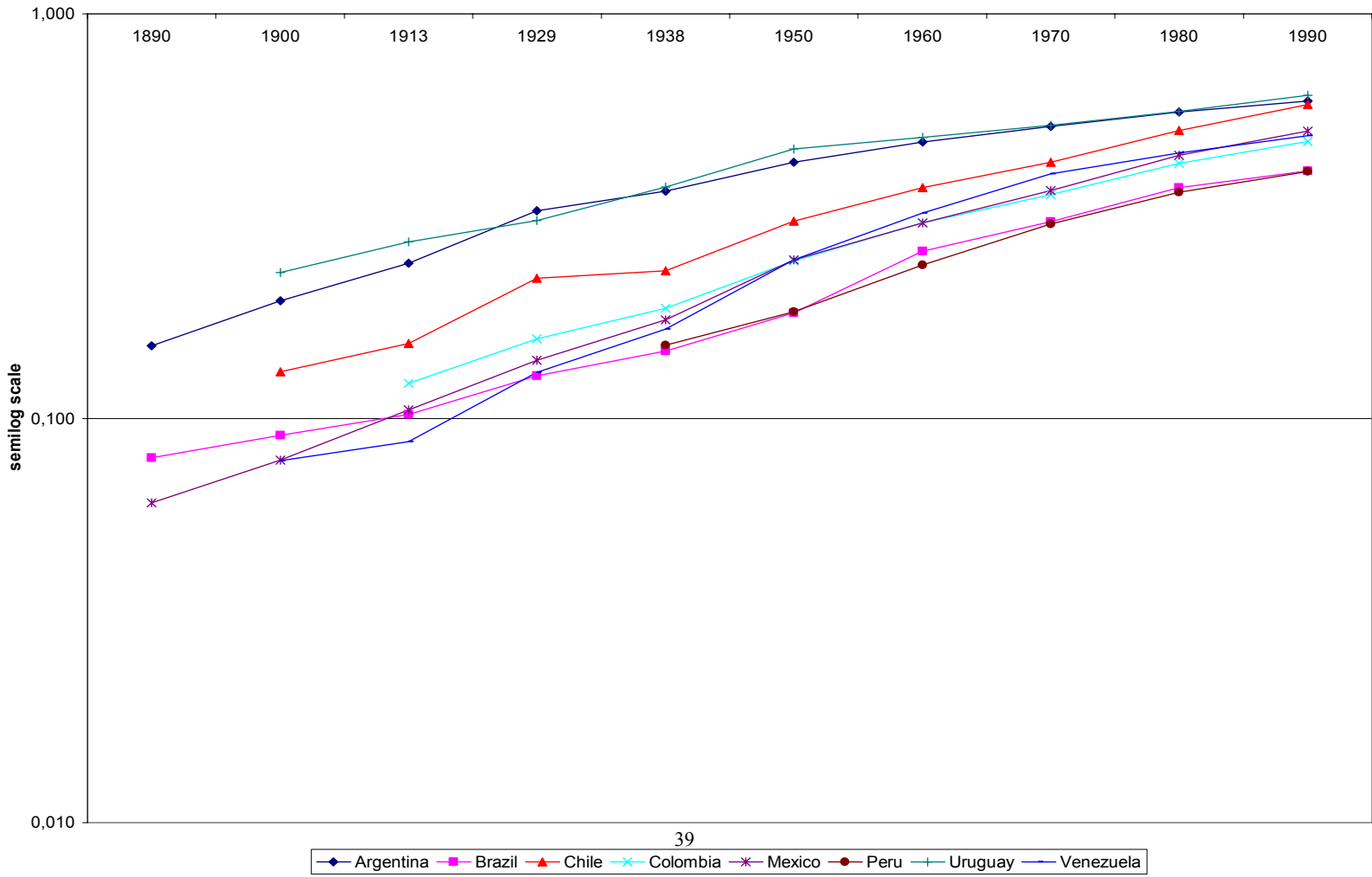
Graph 8. HDI in OECD and Latin America



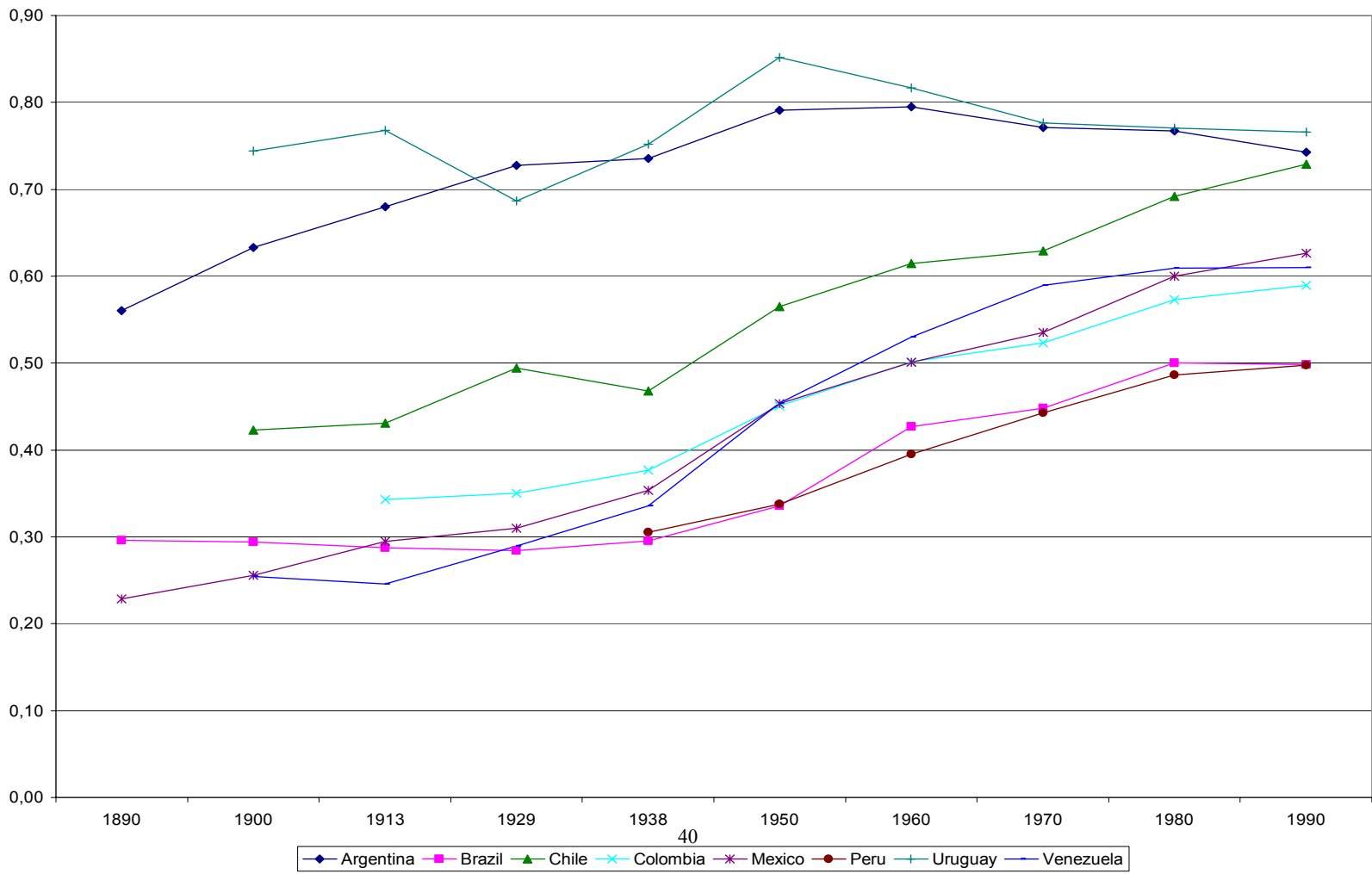
Graph 9. Relative HDI in Latin America (OECD = 1)



Graph 10. HDI in Eight Latin American Countries



Graph 11. Relative HDI in Eight Latin American Countries (OECD = 1)

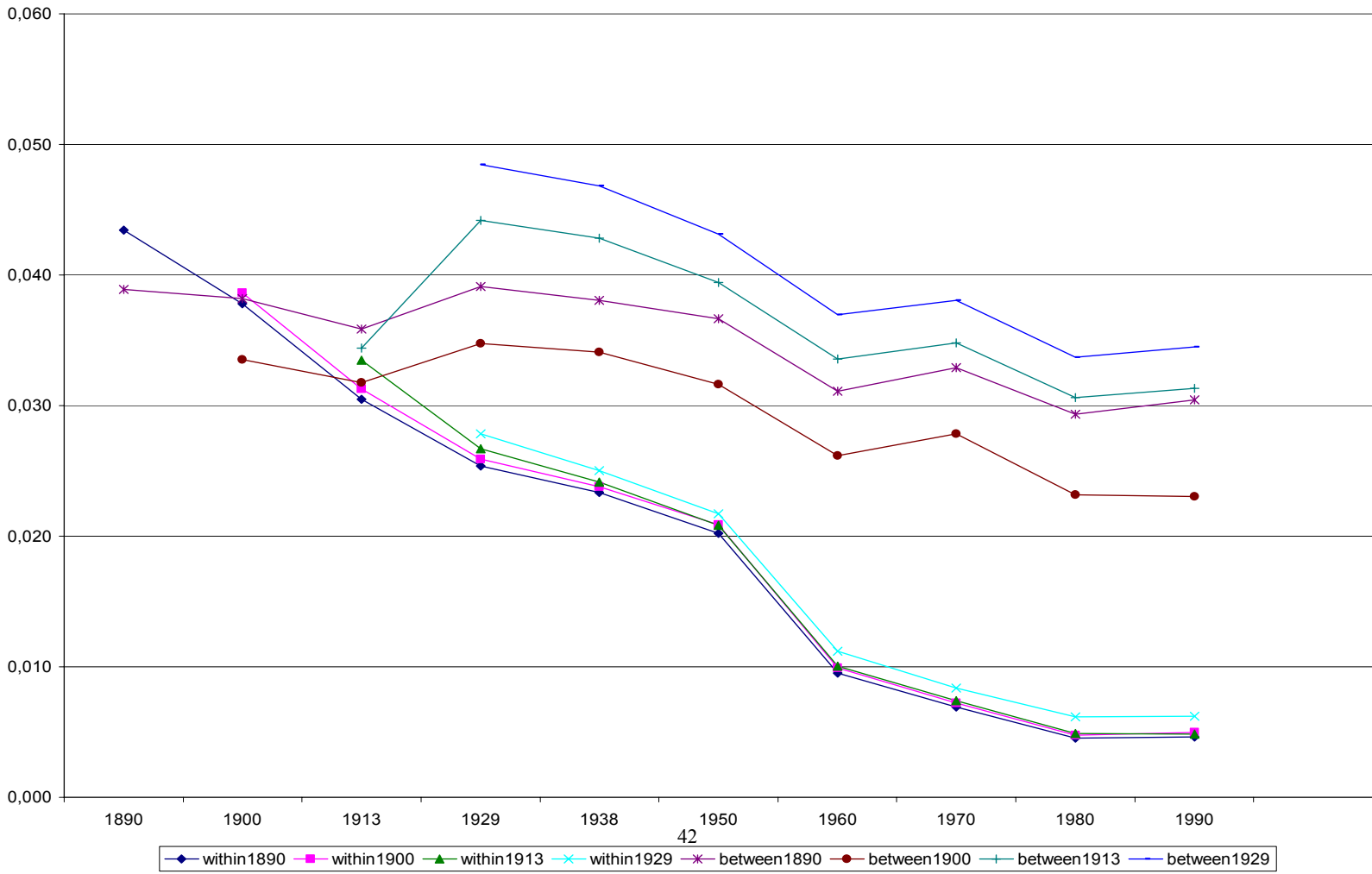




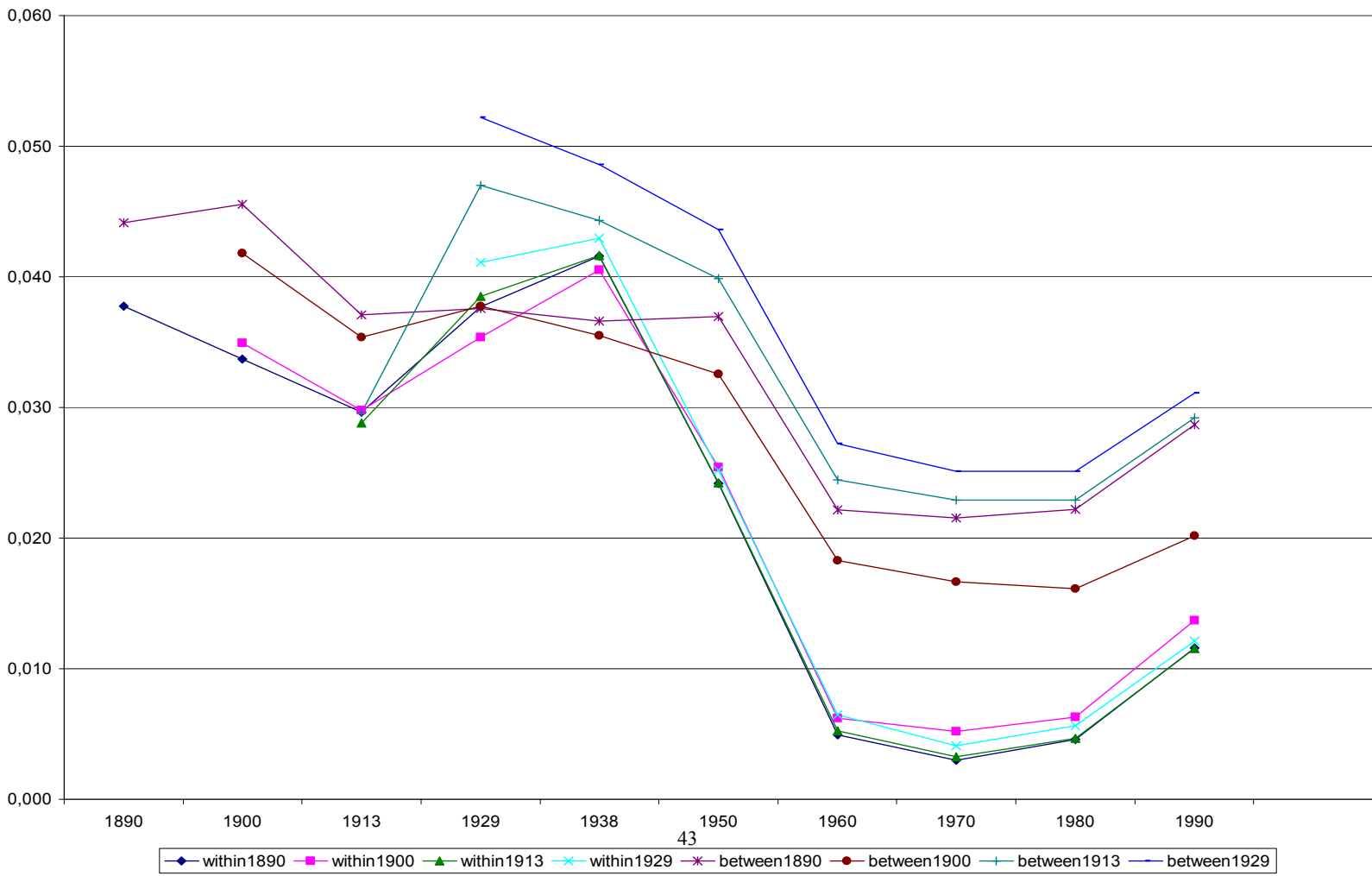
**Graph 12. HDI Inequality in OECD and Latin America**



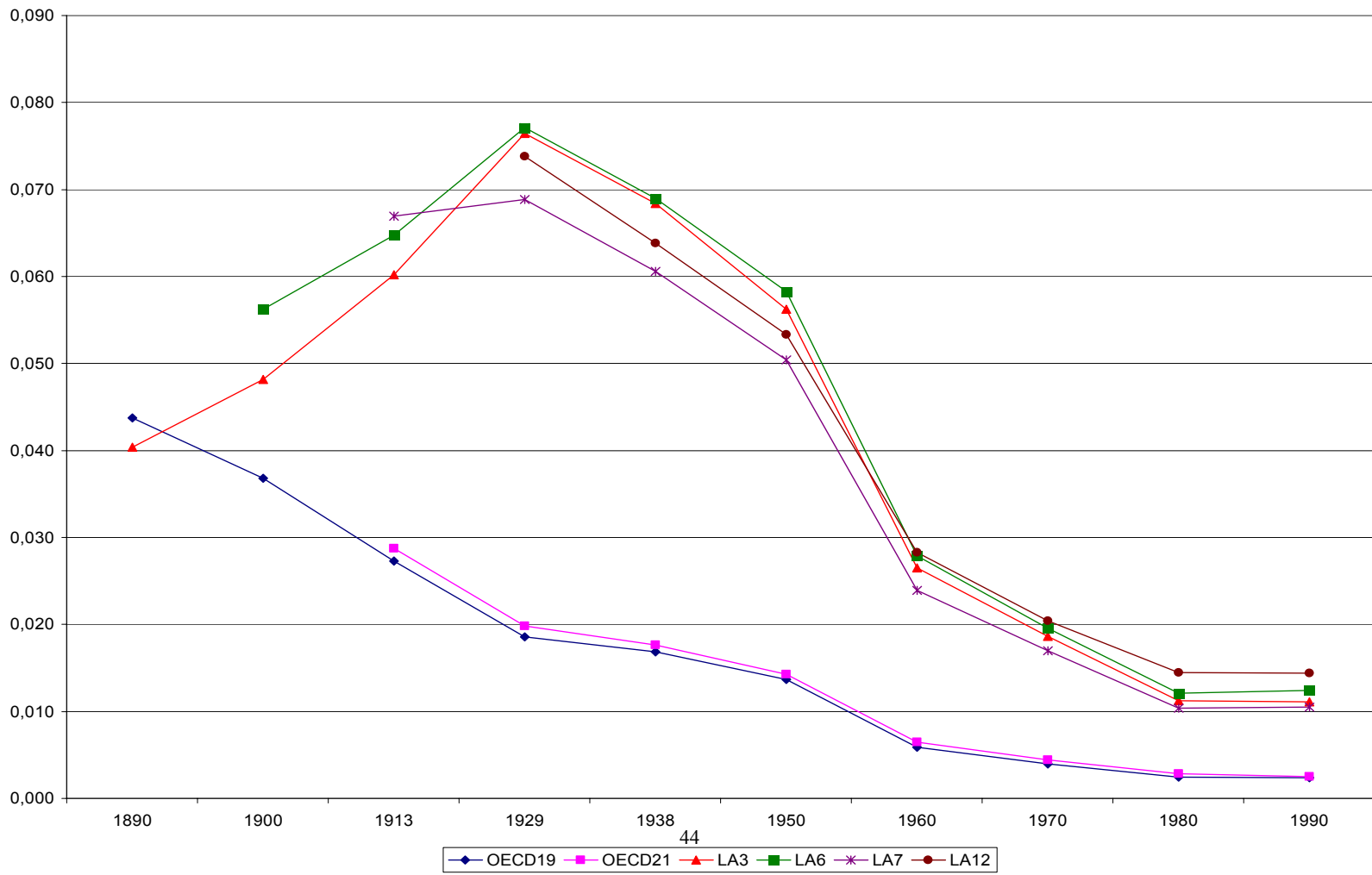
**Graph 13A. Within-regions and Between-regions HDI Inequality in OECD and Latin America (MLD)**



**Graph 13B. Within-Regions and Between-regions HDI Inequality in OECD and Latin America (Theil)**



Graph 14A. HDI Inequality within OECD and Latin America (MLD)



Graph 14B. HDI Inequality within OECD and Latin America (Theil)

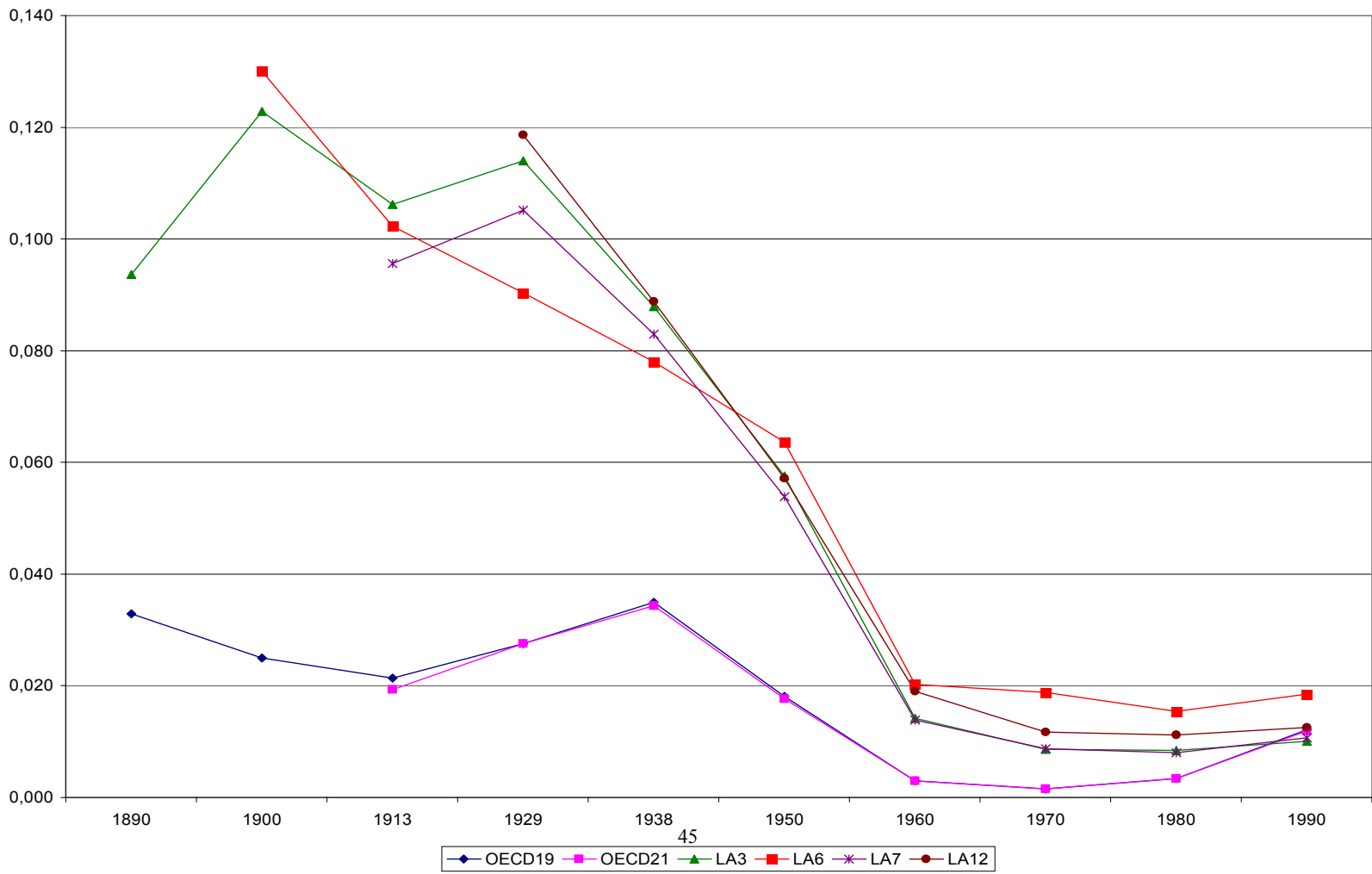


Table 1 (a)

***Decomposing Inequality in OECD and Latin America, 1870–1990***  
*(Estimated with Real GDP per head at 1960 US relative prices)*

	<u>MLD Indices</u>			<u>Population Shares</u>		<u>within-</u>	<u>between-</u>	<u>Theil Indices</u>			<u>within-</u>	<u>between-</u>		
	<i>OECD &amp; Latin America</i>	<i>OECD</i>	<i>Latin America</i>	<i>OECD</i>	<i>Latin America</i>	<i>Inequality</i>	<i>Inequality</i>	<i>OECD &amp; Latin America</i>	<i>OECD</i>	<i>Latin America</i>	<i>OECD</i>	<i>Latin America</i>	<i>Inequality</i>	<i>Inequality</i>
<b>Panel A. Levels of Inequality</b>														
1870	0,106	0,066	0,094	0,9186	0,0814	0,068	0,038	0,094	0,066	0,106	0,9735	0,0265	0,067	0,027
1880	0,112	0,064	0,104	0,9122	0,0878	0,068	0,044	0,094	0,062	0,110	0,9726	0,0274	0,064	0,030
1890	0,104	0,055	0,156	0,9074	0,0926	0,064	0,040	0,084	0,052	0,168	0,9683	0,0317	0,056	0,029
1900	0,117	0,052	0,251	0,8987	0,1013	0,072	0,045	0,087	0,048	0,237	0,9657	0,0343	0,055	0,032
1913	0,125	0,055	0,316	0,8900	0,1100	0,083	0,042	0,091	0,050	0,292	0,9587	0,0413	0,060	0,031
1929	0,133	0,055	0,261	0,8700	0,1300	0,082	0,050	0,099	0,052	0,259	0,9516	0,0484	0,062	0,037
1938	0,119	0,039	0,213	0,8614	0,1386	0,063	0,057	0,087	0,036	0,214	0,9498	0,0502	0,045	0,042
1950	0,221	0,138	0,194	0,8322	0,1678	0,148	0,074	0,186	0,128	0,194	0,9412	0,0588	0,132	0,054
1960	0,175	0,063	0,138	0,8095	0,1905	0,078	0,098	0,135	0,060	0,138	0,9395	0,0605	0,065	0,071
1970	0,183	0,023	0,128	0,7808	0,2192	0,046	0,137	0,124	0,022	0,128	0,9393	0,0607	0,029	0,096
1980	0,175	0,017	0,061	0,7464	0,2536	0,028	0,147	0,126	0,017	0,062	0,9242	0,0758	0,020	0,106
1990	0,249	0,019	0,051	0,7244	0,2756	0,028	0,221	0,169	0,018	0,051	0,9372	0,0628	0,020	0,149
<b>Panel B. Annual Rates of Inequality Reduction</b>														
1870-1913	-0,0038	0,0044	-0,0282			-0,0047	-0,0021	0,0008	0,0065	-0,0235			0,0026	-0,0033
1880-1913	-0,0034	0,0050	-0,0337			-0,0062	0,0015	0,0012	0,0069	-0,0297			0,0020	-0,0004
1913-1938	0,0036	0,0153	0,0158			0,0129	-0,0101	0,0033	0,0140	0,0125			0,0126	-0,0099
1950-1990	-0,0029	0,0501	0,0335			0,0420	-0,0275	0,0025	0,0490	0,0336			0,0470	-0,0252
1870-1990	-0,0071	0,0105	0,0051			0,0076	-0,0147	-0,0049	0,0108	0,0062			0,0100	-0,0143
1880-1990	-0,0073	0,0113	0,0065			0,0082	-0,0147	-0,0053	0,0113	0,0070			0,0105	-0,0144

Table 1 (b)

***Decomposing Inequality in OECD and Latin America, 1913–1990***  
*(Estimated with Real GDP per head at 1960 US relative prices)*

	<u>MLD Indices</u>			Population Shares		within-	between-	<u>Theil Indices</u>			GDP Shares	GDP Shares	within-	between-
	OECD & Latin America	OECD	Latin America	OECD	Latin America	regions Inequality	regions Inequality	OECD & Latin America	OECD	Latin America	OECD	Latin America	regions Inequality	regions Inequality
<b><u>Panel A. Levels of Inequality</u></b>														
1913	0,141	0,059	0,291	0,8722	0,1278	0,089	0,052	0,103	0,054	0,284	0,954	0,046	0,065	0,038
1929	0,145	0,059	0,235	0,8544	0,1456	0,085	0,060	0,110	0,056	0,244	0,947	0,053	0,066	0,044
1938	0,129	0,041	0,187	0,8451	0,1549	0,064	0,065	0,096	0,039	0,194	0,945	0,055	0,047	0,048
1950	0,232	0,144	0,173	0,8146	0,1854	0,150	0,083	0,199	0,134	0,179	0,935	0,065	0,137	0,061
1960	0,193	0,074	0,124	0,7912	0,2088	0,084	0,108	0,152	0,069	0,129	0,934	0,066	0,073	0,079
1970	0,208	0,040	0,116	0,7613	0,2387	0,058	0,150	0,147	0,036	0,121	0,934	0,066	0,041	0,105
1980	0,203	0,038	0,063	0,7276	0,2724	0,045	0,158	0,150	0,032	0,066	0,918	0,082	0,035	0,115
1990	0,280	0,040	0,060	0,7055	0,2945	0,046	0,234	0,196	0,035	0,058	0,932	0,068	0,036	0,159
<b><u>Panel B. Annual Rates of Inequality Reduction</u></b>														
1913-1938	0,0036	0,0145	0,0177			0,0132	-0,0088	0,0031	0,0134	0,0152			0,0125	-0,0090
1950-1990	-0,0047	0,0321	0,0264			0,0295	-0,0260	0,0004	0,0340	0,0281			0,0334	-0,0239
1913-1990	-0,0089	0,0051	0,0205			0,0086	-0,0195	-0,0083	0,0059	0,0206			0,0076	-0,0185

Table 1 (c)

Decomposing Inequality in OECD and Latin America, 1929–1990  
(Estimated with Real GDP per head at 1960 US relative prices)

	<u>MLD Indices</u>			<u>Population Shares</u>		<u>within-</u>	<u>between-</u>	<u>Theil Indices</u>			<u>within-</u>	<u>between-</u>		
	<u>OECD &amp; Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>regions Inequality</u>	<u>regions Inequality</u>	<u>OECD &amp; Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>regions Inequality</u>	<u>regions Inequality</u>
<b>Panel A. Levels of Inequality</b>														
1929	0,149	0,059	0,225	0,8467	0,1533	0,085	0,065	0,113	0,056	0,237	0,945	0,055	0,066	0,048
1938	0,134	0,041	0,182	0,8369	0,1631	0,064	0,070	0,099	0,039	0,192	0,942	0,058	0,048	0,052
1950	0,238	0,144	0,169	0,8053	0,1947	0,149	0,089	0,203	0,134	0,177	0,933	0,067	0,137	0,066
1960	0,201	0,074	0,125	0,7808	0,2192	0,085	0,117	0,158	0,069	0,130	0,931	0,069	0,073	0,084
1970	0,220	0,040	0,117	0,7493	0,2507	0,060	0,160	0,155	0,036	0,123	0,931	0,069	0,042	0,113
1980	0,219	0,038	0,074	0,7142	0,2858	0,048	0,171	0,160	0,032	0,074	0,915	0,085	0,036	0,124
1990	0,303	0,040	0,075	0,6905	0,3095	0,051	0,252	0,209	0,035	0,070	0,929	0,071	0,037	0,172
<b>Panel B. Annual Rates of Inequality Reduction</b>														
1929-1950	-0,0223	-0,0423	0,0137			-0,0269	-0,0154	-0,0278	-0,0420	0,0140			-0,0351	-0,0154
1950-1990	-0,0060	0,0321	0,0202			0,0269	-0,0260	-0,0007	0,0340	0,0232			0,0328	-0,0240
1929-1990	-0,0116	0,0065	0,0180			0,0084	-0,0223	-0,0100	0,0078	0,0200			0,0094	-0,0210



Table 1 (d)

Decomposing Inequality in OECD and Latin America, 1950–1990  
 (Estimated with Real GDP per head at 1960 US relative prices)

	<u>MLD Indices</u>		<u>Population Shares</u>				<u>within-</u>	<u>between-</u>	<u>Theil Indices</u>		<u>GDP Shares</u>		<u>within-</u>	<u>between-</u>
	<u>OECD &amp;</u> <u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>Inequality</u>	<u>Inequality</u>	<u>OECD &amp;</u> <u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>Inequality</u>	<u>Inequality</u>
<u>Panel A. Levels of Inequality</u>														
1950	0,251	0,144	0,171	0,7894	0,2106	0,150	0,101	0,212	0,134	0,180	0,929	0,071	0,138	0,074
1960	0,219	0,074	0,135	0,7643	0,2357	0,088	0,131	0,169	0,069	0,139	0,928	0,072	0,074	0,095
1970	0,243	0,040	0,132	0,7320	0,2680	0,065	0,178	0,168	0,036	0,133	0,928	0,072	0,043	0,125
1980	0,241	0,038	0,089	0,6955	0,3045	0,053	0,187	0,174	0,032	0,084	0,911	0,089	0,037	0,137
1990	0,332	0,040	0,092	0,6701	0,3299	0,057	0,275	0,226	0,035	0,081	0,926	0,074	0,038	0,188
<u>Panel B. Annual Rates of Inequality Reduction</u>														
1950-1990	-0,0070	0,0321	0,0154			0,0241	-0,0250	-0,0016	0,0340	0,0200			0,0322	-0,0232

Table 2

**Assessing the Impact of Differences in Population and per capita GDP Growth in OECD and Latin America Income Inequality: Annual Rates of Inequality Reduction** (Weighted Inequality Measured with Real GDP per head at 1960 US relative prices)

**MLD Indices**

	Counterfactual Zero Variance in <i>Population per capita GDP</i>			Counterfactual Zero Variance in <i>Population per capita GDP</i>		
	Actual Value	Growth	Growth	Actual Value	Growth	Growth
<b>1870-1913</b>	-0,0038	-0,0107	-0,0023			
<b>1880-1913</b>	-0,0034	-0,0106	-0,0021			
<b>1913-1938</b>	0,0036	0,0124	-0,0061	0,0036	0,0122	-0,0061
<b>1913-1950</b>	-0,0142	-0,0143	-0,0082	-0,0135	-0,0127	-0,0080
<b>1950-1990</b>	-0,0029	0,0159	-0,0061	-0,0047	0,0147	-0,0057

**Theil Indices**

	Counterfactual Zero Variance in <i>Population per capita GDP</i>			Counterfactual Zero Variance in <i>Population per capita GDP</i>		
	Actual Value	Growth	Growth	Actual Value	Growth	Growth
<b>1870-1913</b>	0,0008	-0,0129	-0,0016			
<b>1880-1913</b>	0,0012	-0,0130	-0,0014			
<b>1913-1938</b>	0,0033	0,0076	-0,0054	0,0031	0,0072	-0,0055
<b>1913-1950</b>	-0,0183	-0,0222	-0,0077	-0,0176	-0,0207	-0,0076
<b>1950-1990</b>	0,0025	0,0157	-0,0056	0,0004	0,0153	-0,0057

Table 3 (a)

Decomposing Inequality of Human Development in OECD and Latin America, 1890–1990  
 (Human Development estimated with GDP per head at 1960 US relative prices)

	<u>MLD Indices</u>			<u>Population Shares</u>				<u>Theil Indices</u>			<u>GDP Shares</u>			
	<u>OECD &amp; Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>within- regions Inequality</u>	<u>between- regions Inequality</u>	<u>OECD &amp; Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>within- regions Inequality</u>	<u>between- regions Inequality</u>
<u>Panel A. Levels of Inequality</u>														
1890	0,082	0,044	0,040	0,9199	0,0801	0,043	0,039	0,082	0,033	0,094	0,9199	0,0801	0,038	0,044
1900	0,076	0,037	0,048	0,9113	0,0887	0,038	0,038	0,079	0,025	0,123	0,9113	0,0887	0,034	0,046
1913	0,066	0,027	0,060	0,9022	0,0978	0,031	0,036	0,067	0,021	0,106	0,9022	0,0978	0,030	0,037
1929	0,064	0,019	0,076	0,8826	0,1174	0,025	0,039	0,075	0,028	0,114	0,8826	0,1174	0,038	0,038
1938	0,061	0,017	0,068	0,8741	0,1259	0,023	0,038	0,078	0,035	0,088	0,8741	0,1259	0,042	0,037
1950	0,057	0,014	0,056	0,8466	0,1534	0,020	0,037	0,061	0,018	0,058	0,8466	0,1534	0,024	0,037
1960	0,041	0,006	0,027	0,8255	0,1745	0,010	0,031	0,027	0,003	0,014	0,8255	0,1745	0,005	0,022
1970	0,040	0,004	0,019	0,7979	0,2021	0,007	0,033	0,024	0,002	0,009	0,7979	0,2021	0,003	0,022
1980	0,034	0,002	0,011	0,7653	0,2347	0,005	0,029	0,027	0,003	0,008	0,7653	0,2347	0,005	0,022
1990	0,035	0,002	0,011	0,7451	0,2549	0,005	0,030	0,040	0,012	0,010	0,7451	0,2549	0,012	0,029
<u>Panel B. Annual Rates of Inequality Reduction</u>														
1890-1913	0,0094	0,0205	-0,0174			0,0154	0,0035	0,0089	0,0188	-0,0055			0,0105	0,0075
1900-1913	0,0104	0,0230	-0,0171			0,0165	0,0048	0,0132	0,0123	0,0112			0,0099	0,0158
1913-1938	0,0002	0,0196	0,0014			0,0126	-0,0099	-0,0180	-0,0243	0,0013			-0,0181	-0,0179
1950-1990	0,0121	0,0436	0,0406			0,0370	0,0046	0,0104	0,0101	0,0436			0,0184	0,0063
1890-1990	0,0085	0,0290	0,0129			0,0224	0,0025	0,0071	0,0100	0,0223			0,0118	0,0043
1900-1990	0,0086	0,0304	0,0163			0,0234	0,0025	0,0075	0,0081	0,0278			0,0119	0,0051
1913-1990	0,0073	0,0317	0,0241			0,0252	-0,0003	0,0028	0,0059	0,0285			0,0107	-0,0026

Table 3 (b)

*Decomposing Inequality of Human Development in OECD and Latin America, 1900–1990*  
*(Human Development estimated with GDP per head at 1960 US relative prices)*

	<u>MLD Indices</u>			<u>Population Shares</u>		<u>within-</u>	<u>between-</u>	<u>Theil Indices</u>			<u>GDP Shares</u>	<u>GDP Shares</u>	<u>within-</u>	<u>between-</u>
	<i>OECD &amp; Latin America</i>	<i>OECD</i>	<i>Latin America</i>	<i>OECD</i>	<i>Latin America</i>	<i>Inequality</i>	<i>Inequality</i>	<i>OECD &amp; Latin America</i>	<i>OECD</i>	<i>Latin America</i>	<i>OECD</i>	<i>Latin America</i>	<i>Inequality</i>	<i>Inequality</i>
<b>Panel A. Levels of Inequality</b>														
1900	0,072	0,037	0,056	0,9040	0,0960	0,039	0,034	0,077	0,025	0,130	0,9040	0,0960	0,035	0,042
1913	0,063	0,027	0,065	0,8948	0,1052	0,031	0,032	0,065	0,021	0,102	0,8948	0,1052	0,030	0,035
1929	0,061	0,019	0,077	0,8743	0,1257	0,026	0,035	0,073	0,027	0,090	0,8743	0,1257	0,035	0,038
1938	0,058	0,017	0,069	0,8657	0,1343	0,024	0,034	0,076	0,035	0,078	0,8657	0,1343	0,041	0,035
1950	0,053	0,014	0,058	0,8380	0,1620	0,021	0,032	0,058	0,018	0,064	0,8380	0,1620	0,025	0,033
1960	0,036	0,006	0,028	0,8173	0,1827	0,010	0,026	0,024	0,003	0,020	0,8173	0,1827	0,006	0,018
1970	0,035	0,004	0,020	0,7906	0,2094	0,007	0,028	0,022	0,002	0,019	0,7906	0,2094	0,005	0,017
1980	0,028	0,002	0,012	0,7594	0,2406	0,005	0,023	0,022	0,003	0,015	0,7594	0,2406	0,006	0,016
1990	0,028	0,002	0,012	0,7401	0,2599	0,005	0,023	0,034	0,012	0,019	0,7401	0,2599	0,014	0,020
<b>Panel B. Annual Rates of Inequality Reduction</b>														
1900-1913	0,0104	0,0228	-0,0108			0,0163	0,0042	0,0126	0,0120	0,0184			0,0123	0,0128
1913-1938	0,0001	0,0198	0,0020			0,0125	-0,0117	-0,0180	-0,0243	0,0009			-0,0183	-0,0178
1950-1990	0,0157	0,0437	0,0387			0,0358	0,0079	0,0134	0,0101	0,0308			0,0154	0,0120
1900-1990	0,0105	0,0304	0,0168			0,0228	0,0042	0,0091	0,0081	0,0216			0,0104	0,0081
1913-1990	0,0094	0,0318	0,0229			0,0244	0,0013	0,0046	0,0059	0,0190			0,0081	0,0015

Table 3 (c)

Decomposing Inequality of Human Development in OECD and Latin America, 1913–1990  
 (Human Development estimated with GDP per head at 1960 US relative prices)

	<u>MLD Indices</u>			<u>Population Shares</u>		<u>within-</u>	<u>between-</u>	<u>Theil Indices</u>			<u>within-</u>	<u>between-</u>		
	<u>OECD &amp; Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>Inequality</u>	<u>Inequality</u>	<u>OECD &amp; Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>OECD</u>	<u>Latin America</u>	<u>Inequality</u>	<u>Inequality</u>
<b>Panel A. Levels of Inequality</b>														
1913	0,068	0,029	0,067	0,8757	0,1243	0,033	0,034	0,058	0,019	0,096	0,8757	0,1243	0,029	0,030
1929	0,071	0,020	0,069	0,8593	0,1407	0,027	0,044	0,086	0,028	0,105	0,8593	0,1407	0,038	0,047
1938	0,067	0,018	0,061	0,8497	0,1503	0,024	0,043	0,086	0,034	0,083	0,8497	0,1503	0,042	0,044
1950	0,060	0,014	0,050	0,8186	0,1814	0,021	0,039	0,064	0,018	0,054	0,8186	0,1814	0,024	0,040
1960	0,044	0,006	0,024	0,7940	0,2060	0,010	0,034	0,030	0,003	0,014	0,7940	0,2060	0,005	0,024
1970	0,042	0,004	0,017	0,7635	0,2365	0,007	0,035	0,026	0,002	0,009	0,7635	0,2365	0,003	0,023
1980	0,036	0,003	0,010	0,7281	0,2719	0,005	0,031	0,028	0,003	0,008	0,7281	0,2719	0,005	0,023
1990	0,036	0,002	0,011	0,7042	0,2958	0,005	0,031	0,041	0,012	0,011	0,7042	0,2958	0,012	0,029
<b>Panel B. Annual Rates of Inequality Reduction</b>														
1913-1938	0,0006	0,0195	0,0040			0,0131	-0,0087	-0,0154	-0,0230	0,0056			-0,0147	-0,0161
1950-1990	0,0127	0,0437	0,0391			0,0364	0,0057	0,0113	0,0099	0,0405			0,0186	0,0078
1913-1990	0,0082	0,0318	0,0240			0,0251	0,0012	0,0047	0,0063	0,0285			0,0119	0,0002

Table 3 (d)

Decomposing Inequality of Human Development in OECD and Latin America, 1929-1990  
 (Human Development estimated with GDP per head at 1960 US relative prices)

	<u>MLD Indices</u>			Population Shares				<u>Theil Indices</u>		GDP Shares				
	OECD & Latin America	OECD	Latin America	OECD	Latin America	within- regions Inequality	between- regions Inequality	OECD & Latin America	OECD	Latin America	OECD	Latin America	within- regions Inequality	between- regions Inequality
<u>Panel A. Levels of Inequality</u>														
1929	0,076	0,020	0,074	0,8513	0,1487	0,028	0,048	0,093	0,028	0,119	0,8513	0,1487	0,041	0,052
1938	0,072	0,018	0,064	0,8412	0,1588	0,025	0,047	0,092	0,034	0,089	0,8412	0,1588	0,043	0,049
1950	0,065	0,014	0,053	0,8089	0,1911	0,022	0,043	0,069	0,018	0,057	0,8089	0,1911	0,025	0,044
1960	0,048	0,006	0,028	0,7830	0,2170	0,011	0,037	0,034	0,003	0,019	0,7830	0,2170	0,006	0,027
1970	0,046	0,004	0,020	0,7508	0,2492	0,008	0,038	0,029	0,002	0,012	0,7508	0,2492	0,004	0,025
1980	0,040	0,003	0,014	0,7138	0,2862	0,006	0,034	0,031	0,003	0,011	0,7138	0,2862	0,006	0,025
1990	0,041	0,002	0,014	0,6883	0,3117	0,006	0,034	0,043	0,012	0,013	0,6883	0,3117	0,012	0,031
<u>Panel B. Annual Rates of Inequality Reduction</u>														
1929-1950	0,0077	0,0156	0,0155			0,0118	0,0055	0,0145	0,0212	0,0348			0,0233	0,0086
1950-1990	0,0117	0,0437	0,0328			0,0314	0,0056	0,0116	0,0099	0,0379			0,0184	0,0084
1929-1990	0,0103	0,0340	0,0268			0,0246	0,0056	0,0126	0,0138	0,0368			0,0201	0,0085