

**Real Wages and Relative Factor Prices in the Third World 1820-1940:  
Latin America**

by

**Jeffrey G. Williamson  
Harvard University**

Discussion Paper Number 1853  
November 1998

**Harvard Institute of Economic Research  
Harvard University  
Cambridge, Massachusetts**

I would like to thank Fausto Alzati, Luis Bertola, Luis Catao, John Coatsworth, Sebastian Coll, Roberto Cortes-Conde, Gerry della Paolera, Aurora Gomez, Steve Haber, Dani Kaufman, Robert Levine and Jaime Reis for their help in guiding me to the data underlying the analysis in this paper. I would also like to acknowledge the excellent research assistance of Davin Chor, Graciela Marquez, Rebecca Rissman and Matt Weinzierl, all of whom have been involved at various points since 1995 when this project started. One of the goals of the project has always been to make the data base available in the paper's Appendices. In addition, the data can be downloaded from my web site <http://www.economics.harvard.edu/~jwilliam>. This working paper has two **HIER Discussion Paper** companions: **Real Wages and Relative Factor Prices in the Third World 1820-1940: Asia** [1998a] and **Real Wages and Relative Factor Prices in the Third World 1820-1940: The Mediterranean Basin** [1998b] which are also available upon request. The data from Asia and the Mediterranean, and the two papers themselves, can also be downloaded from my web site.

## Abstract

By 1914, there were huge economic gaps between the Southern Cone plus Cuba and the rest of Latin America. When did the gaps appear? Can they be explained by the varying ability of these countries to exploit the first great globalization boom after about 1870? Or did the gaps appear much earlier, and were they established by different experience with colonialism, war and civil war, or perhaps by geographic isolation? And what about the gaps between Latin America and the Mediterranean Basin, let alone with industrial leaders like Britain? Which countries in Latin America started catching up after mid-century, which fell further behind, and which held their own? What role did globalization and demographic forces, including immigration, play in the process? Conventional quantitative evidence, like current GDP estimates, is much too incomplete to confront these central questions, especially as they apply to the previous century. In an effort to suggest a new research agenda for the region, this essay uses a new data base on real wages and relative factor prices for seven major Latin American regions -- Argentina, Brazil (Southeast and Northeast), Colombia, Cuba, Mexico and Uruguay -- as well as for the three Mediterranean regions which were a source of so many of Latin America's immigrants -- Portugal, Spain and Italy. These ten regions, plus comparative information from Britain and the United States, form the data base for the paper.

JEL F02 F22 N10 O5

Jeffrey G. Williamson  
216 Littauer Center  
Harvard University  
Cambridge, MA 02138  
jwilliam@kuznets.fas.harvard.edu

## New Data, Old Questions

Two important features of the world economy after 1950 also characterized the economy after 1850. First, there was rapid globalization a century ago too: capital and labor flowed across national frontiers in unprecedented quantities, and at rising rates; and commodity trade boomed as transport costs dropped sharply. Second, the late 19th century underwent an impressive convergence in living standards, at least within most of what we would now call the OECD club, but what historians call the Atlantic economy. Poor countries around the European periphery tended to grow faster than the rich industrial leaders at the European core, and often even faster than the richer countries overseas in the New World. This club excluded most of what is now called the Third World and eastern Europe, and even around this limited periphery there were some who failed to catch up. Nonetheless, there was convergence.

It was not always that way: unambiguous divergence took place earlier. In the first half of the previous century, the Atlantic economy was characterized by high tariffs, modest commodity trade, no mass migrations, and an underdeveloped global capital market. Two profound shocks occurred in this environment still hostile to liberal globalization policy: early industrialization in Britain which then spread to a few countries on the European continent; and resource "discovery" in the New World, set in motion by sharply declining transport costs linking overseas suppliers to European markets, so much so that real freight rates fell by an enormous 1.5 percent per annum between 1840 and 1910 (O'Rourke and Williamson, 1998: ch. 3). These two shocks triggered a divergence in real wages and living standards across the Atlantic economy that lasted until the middle of the century (Williamson 1996).<sup>1</sup>

---

<sup>1</sup> Prasannan Parthasarathi (1998) also uses this dating to describe lagging India, and so does

---

Kenneth Pomeranz (1997) for lagging China. In contrast, Robert Allen (1998) argues that the divergence within Europe started long before the industrial revolution. Elsewhere, I explore these competing views with real wage evidence from the Mediterranean Basin (Williamson 1998b) and Asia (Williamson 1998a), data much like that presented here for Latin America.

Figure 1 shows that the convergence which started in mid-century continued up to 1914: a plot of the dispersion of real wages is given there, documenting what the modern macro economists call beta-convergence. The line with the diamonds on the upper left of Figure 1 is based on a 13-country Atlantic economy sample including Australia, Belgium, Brazil, France, Germany, Great Britain, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the United States. The dashed line in Figure 1 documents convergence for an expanded 17-country Atlantic economy sample, now including in addition Argentina, Canada, Denmark and Italy. This measure shows the convergence tide ebbing around 1900. If we exclude Canada and the United States, two *exceptional* rich countries which bucked the convergence tide, convergence continues rapidly up to 1914 (the 15-country sample plotted with the triangles). If we exclude in addition two Mediterranean Basin countries which failed to play the globalization game, Portugal and Spain, convergence up to 1914 is faster still (the 13-country sample plotted with the squares).

Meanwhile, how did Latin America do? Based on macro data reviewed by John Coatsworth (1993), it is very difficult to tell. Coatsworth thinks that there was no growth in GDP per capita at all in any of the colonial economies between 1700 and 1820. Since there was hardly much per capita income growth in Europe either during that century, one might conclude that Latin America maintained its relative position *vis a vis* Europe, and that the economic gaps between regions within Latin America changed but little. The half century between 1820 and 1870 was one of revolution, civil war and early independence. Like Africa today, Latin America was an economic and political basket case. Angus Maddison (1995) offers GDP per capita growth evidence for Brazil and Mexico only, and they both do very badly, Brazil growing by only 10 percent over the five decades as a whole and Mexico declining by 7 percent. Coatsworth guesses that Colombia underwent no growth over the period. This evidence certainly confirms that Latin America fell behind the United States and Britain up to 1870, since those two leaders registered GDP per capita growth rates of about 1 percent per annum. It says very little, however, about growing or contracting gaps between regions *within* Latin America. Latin American economic performance is better documented between mid-century and the

Great War in Europe (Maddison 1995; Engerman and Sokoloff 1996), and the period offers two notable facts. First, the poorest Latin American countries were growing slowest, illustrated by Brazil and Peru, while the richest Latin American countries were growing fastest, illustrated by Argentina, Chile and Mexico. This limited evidence certainly seems to point to economic divergence within the region. Second, the region as a whole seemed to be holding its own relative to Europe. Indeed, the fast growing richer regions were actually catching up. We would like to be more precise, however. Exactly when and where did the catching up and falling behind take place? We need to know the answers if the correlates of economic success and failure in Latin America are to be identified. This macro data just reviewed will not provide the necessary evidence since it is available only for benchmark years separated by decades, and important regions like Cuba and Colombia are excluded.

In any case, it is not clear that GDP per capita and real wages should have behaved in the same way. So, what happened to real wages and living standards when Latin America responded to the challenge of both the European Industrial Revolution and the First Great Globalization Boom? And what happened to both real wages and GDP per capita during war, interwar and autarky after 1913?

These are the questions that motivate this essay. They are in the tradition of W. Arthur Lewis who was the first to ask whether the core pulled along the periphery during this First Great Globalization Boom (Lewis 1969, 1978a, 1978b). It was he, together with Alexander Gerschenkron (1952), who first tried to break the economic historian's tenacious fixation on the industrial leaders, Lewis focusing on the Third World and Gerschenkron on European late comers like Italy and eastern Europe. Thus, these questions are not new to Latin American economic history, but they could not be attacked very well even only a decade ago since the data had not been gathered in such a way as to make these comparative judgments possible. Now we have enough to make some real progress.

## **Latin America and the Atlantic Economy: Overthrowing the Tyranny of Distance<sup>2</sup>**

In a book entitled The Tyranny of Distance (1966), Geoffrey Blainey showed how distance shaped Australian history. Distance had the same impact on the rest of Asia until late in the 19th century, isolating Asia from Europe where, after all, the industrial revolution was unfolding. Late in the 19th century, transport innovations started to change all that, although not completely. The appearance of the Suez Canal, cost-reducing innovations on sea-going transport, and railroads penetrating the interior may not have completely liberated Asia from the tyranny of distance by 1914, but it helped enormously.

Why shouldn't this account about economic isolation apply to Latin America as well? It is certainly consistent with the new economic geography (Krugman 1991a, 1991b). After all, the economic distance to the European core varied considerably depending on location in Latin America. The Panama Canal was not completed until 1914, and before then the Andean economies -- Peru and Ecuador -- must have been very seriously disadvantaged in European trade. And prior to the introduction of a railroad network, which didn't really start until the 1870s, the landlocked countries of Bolivia and Paraguay were at an even more serious disadvantage. This was also true of the Mexican interior (Coatsworth 1981), the Colombian interior, and the Argentine interior (Newland 1998). A close observer of early 19th century Latin America, Belford Hinton Wilson reported in 1842 the costs of moving a ton of goods from England to the following capital cities (in pounds sterling): Buenos Aires and Montevideo 2; Lima 5.12; Santiago 6.58; Caracas 7.76; Mexico City 17.9; Quito 21.3; Sucre or Chuquisca, 25.56; and Bogata 52.9. The variance is huge, with the costs to Ecuador (Quito), Bolivia (Sucre or Chuquisca), New Granada (e.g., Colombia, Bogata), and Mexico nine to twenty-seven times that of Buenos Aires and Montevideo, both well placed on either side of the Rio de la Plata (Brading 1969: 243-4).

Geographic isolation helps explain much of the subsequent poor growth performance in these (mostly poor) parts of Latin America in the 19th century. Even after the Latin American late 19th century railroad boom, much of the region's interior was still isolated: for example, railway track per 1,000

population in Bolivia, Ecuador, Paraguay and Peru was still only about a tenth that of Australia, New Zealand and Canada in 1912 (Bulmer-Thomas 1994: Table 4.4, p. 107). Furthermore, the tyranny of distance did not disappear as a development obstacle in these poor and initially-isolated parts of Latin America even after 1950. Indeed, economists have shown that poor growth performance today is still associated with whether a country is landlocked, whether the length of its coastline is limited, and whether its distance from Tokyo, New York or Rotterdam is long (Radelet, Sachs and Lee 1997). Bolivia, Ecuador, Paraguay, Peru, the Argentine interior and the Mexican interior all face a trade disadvantage, and if trade matters to growth, those regions face a growth disadvantage as well.

In contrast, the Latin American regions bordering on the Atlantic, with long coastlines and with good navigable river systems, have always been favored by a trade advantage and thus a growth advantage as well. These include Argentina, Brazil, Venezuela, Central America, Cuba and the other Caribbean islands. Of course, these regions may have failed for other reasons, but geographic isolation certainly wasn't one of them.

Transport cost declines from interior to port, and from port to Europe or to the East and Gulf Coast of the United States, ensured that Latin American economies became more integrated into world markets after around 1850. Price gaps between Britain and both Americas were driven down and trade stimulated as a consequence. True, transport costs and price differentials involving trade between Europe and North America are far better documented than are those between Europe and South America. Yet, the qualitative literature suggests that the same was happening south of the US border.

Prior to the railway era, transportation was either by road or water, with water being the cheaper option by far. Thus, investment in river and harbor improvements increased briskly everywhere in the Atlantic economy. Steamships were the most important 19th century contribution to shipping technology. The *Claremont* made its debut on the Hudson in 1807; a steamer had made the journey up the Mississippi as far as Louisville by 1815; British steamers had traveled up the Seine to Paris by 1816. In the first half of the century, steamships were mainly used on important rivers, the Great Lakes, and inland seas such as the Baltic



and the Mediterranean. A regular trans-Atlantic steam service was inaugurated in 1838, but until 1860 steamers mainly carried high-value goods similar to those carried by airplanes today, like passengers, mail and gourmet food.

The switch from sail to steam may have been gradual, but it accounted for a steady decline in transport costs across the Atlantic (Harley 1988). A series of innovations in subsequent decades helped make steamships more efficient: the screw propeller, the compound engine, steel hulls, bigger size and shorter turn-around time in port. Before 1869, steam tonnage had never exceeded sail tonnage in British shipyards; in 1870, steam tonnage was over twice as great as sail, and sail tonnage only exceeded steam in two years after that date (Fletcher 1958: 560).

Refrigeration was another technological innovation with major trade implications. Mechanical refrigeration was developed between 1834 and 1861, and by 1870 chilled beef was being transported from the United States to Europe (Mokyr 1990: 141). In 1876, the first refrigerated ship, the *Frigorifique*, sailed from Argentina to France carrying frozen beef. By the 1880s, South American meat was being exported in large quantities to Europe. Not only did railways and steamships mean that European farmers were faced with overseas competition in the grain market, but refrigeration also deprived them of the natural protection distance had always provided local meat and dairy producers. The consequences for European farmers of this overseas competition would be profound (O'Rourke 1997; O'Rourke and Williamson 1998: Chp. 6).

What was the impact of these transport innovations on the cost of moving goods between markets? Certainly trade boomed in Latin America. While the estimates offered by Victor Bulmer-Thomas (1994: Table A.2.1, p. 439) may be rough, they certainly prove the point. The share of Latin American exports in GDP was around 10 percent in 1850, while in 1912 it was 25 percent. But when economists look at this period, they tend to ignore the fact that the decline in transAtlantic transport costs after mid century was enormous, and focus instead only on trade. This is a mistake. The volume of trade is not by itself a satisfactory index of commodity market integration. It is the cost of moving goods between markets that

counts. The cost has two parts, that due to transport and that due to trade barriers (such as tariffs). The price spread between markets is driven by changes in these costs, and they need not move in the same direction. It turns out that tariffs in the Atlantic economy did not fall from the 1870s to World War I; the globalization which took place in the late 19th century cannot be assigned to more liberal trade policy. Instead, it was falling transport costs which provoked globalization. Indeed, rising tariffs were mainly a defensive response to the competitive winds of market integration as transport costs declined (O'Rourke and Williamson 1998: Chps. 3 and 6).

The impact of these productivity improvements on transport costs around the Atlantic economy can be seen graphically in Figure 2. What is labeled the North index (North 1958) accelerates its fall after the 1830s, and what is labeled the British index (Harley 1988) is fairly stable up to mid century before undergoing the same, big fall. The North freight rate index among American export routes dropped by more than 41 percent in real terms between 1870 and 1910. The British index fell by about 70 percent, again in real terms, between 1840 and 1910. These two indices imply a steady decline in Atlantic economy transport costs of about 1.5 percent per annum, for a total of 45 percentage points up to 1913, a big number indeed. There is another way to get a comparative feel for the magnitude of this decline. The World Bank reports that tariffs on manufactures entering developed country markets fell from 40 percent in the late 1940s to 7 percent in the late 1970s, a 33 percentage point decline over thirty years (Wood 1994: 173). While impressive, this spectacular postwar reclamation of "free trade" from interwar autarky is still smaller than the 45 percentage point fall in trade barriers between 1870 and 1913 due to transport improvements.

What was the impact of changing transport costs and tariffs on trans-Atlantic price gaps in the late 19th century? Did they produce significant commodity price convergence between Latin America and world markets? If they behaved anything like Anglo-American price differentials, they certainly must have. Liverpool wheat prices exceeded Chicago wheat prices by 58 percent in 1870, by 18 percent in 1895, and by 16 percent in 1912.<sup>3</sup> Moreover, these estimates understate the size of the price convergence because they

ignore the collapse in price gaps between farm and interior railhead. Was the experience in Anglo-American wheat markets repeated for other foodstuffs? The second biggest tradable foodstuff consisted of meat and animal fats such as beef, pork, mutton and butter. Based on London-Cincinnati price differentials for bacon, there was no convergence across the 1870s and 1880s, but the price convergence after 1895 was even more dramatic for meat than it was for wheat: price gaps were 93 percent in 1870, 92 percent in 1895, and 18 percent in 1913. The delay in price convergence for meat has an easy explanation: it required the advances in refrigeration made towards the end of the century. Anglo-American price data are also available for many other non-agricultural commodities. The Boston-Manchester cotton textile price gap, which had been 14 percent in 1870, completely vanished by 1913; the Philadelphia-London iron bar price gap fell from 75 to 21 percent, while the pig iron price gap fell from 85 to 19 percent, and the copper price gap fell from 33 percent to almost zero. More relevant to Argentina and Uruguay, the Boston-London hides price gap fell from 28 to 9 percent, while the wool price gap fell from 59 to 28 percent.

The decline in transport costs created commodity price convergence in the Atlantic economy up to the Great War, and most of Latin America was part of it. Trade boomed. With Latin American globalization forces now on the table, let us turn now to growth in the region.

### **The Growth of What?**

Most economists who have written about the comparative growth of nations have used GDP per capita or per worker to measure catching up and convergence, or falling behind and divergence. This and other essays of mine favor instead real wage rates (purchasing-power-parity adjusted, and typically for urban unskilled workers) and other factor prices (like land rents and skill premia). I can think of at least four good reasons why it is a mistake for the convergence debate to have ignored wages and other factor prices, especially for the previous century and earlier.

First, the pre-1940 real wage data -- certainly for Latin America -- are of far better quality than the GDP per capita data, and they are certainly available for a wider sample. Indeed, Angus Maddison (1995) is able to document real GDP per capita for a surprisingly small part of 19th century Latin America: for 1820, he gives estimates of GDP per capita only for Brazil and Mexico, two countries which based on 1900 population data would have accounted for only 53 percent of Latin America; a half century later, he offers estimates for one more, Argentina, raising the share of Latin America covered to 61 percent (again, based on 1900 population); thirty years later, he offers estimates for four more, but there are still many missing. It seems to me that the available GDP per capita data are not sufficient by themselves to deal adequately with the questions raised in the introduction. As this paper and Appendices 1-7 show, real wages can be documented for the following (so far): Argentina from 1864; Southeast Brazil from 1830; Northeast Brazil from 1855; Colombia from 1863; Cuba from 1905; Mexico from 1877; and Uruguay from 1880. Furthermore, we can begin making statements about PPP-adjusted (purchasing-power-parity adjusted) real wages relative to the European core from each of those dates. In addition, these real wage time series are typically available annually, so that epochs and major turning points can be identified with much greater clarity than is true of the GDP data which are typically reported for every two decades or even longer.

Second, income distribution matters, and wage rates (especially when combined with other factor prices) offer a window by which to look in on distribution issues. Real people earn wages or skill premia or profits or rents, not that statistical artifact known as GDP per capita. GDP per worker hour may sound like a good measure of aggregate productivity, but surely the living standards of ordinary workers as captured by real wages are a better indicator of the economic well-being of the vast majority in any society. By averaging all incomes, macro economists (and economic historians that mimic them) throw away valuable information.

Third, factor price movements help us understand the growth of nations. For example, productivity catch-up in Latin America was more likely to increase all factor prices equally than was mass immigration (increasing population pressure on the land) or an export boom for agricultural products (increasing the

demand for land). The open economy forces which may have been important in driving late 19th century economic change in Latin America -- trade, migration and capital flows -- operated directly on factor prices, and thus only indirectly on GDP per capita.<sup>4</sup> An exclusive focus on GDP per capita misses most of the story.

Fourth, economic change nearly always involves winners and losers, a fact which is crucial in accounting for the evolution of policy, perhaps more so in politically independent Latin American societies than in dependent colonial societies in Asia and Africa. Indeed, distributional effects may even influence the survival of newly independent countries. Changes that would increase GDP per capita but would also cause losses to some politically powerful group are often successfully resisted, and examining the behavior of factor prices is a good way to start the search for the sources of such political resistance.

### **The Latin American Real Wage Hierarchy Around the Turn of the Century**

Table 1 pulls together estimates of the real wage hierarchy around Latin America and between it and the European industrial leader, Britain. The assessment is made around the turn of the century. All of the estimates in Table 1 calculate urban unskilled wages from various parts of Latin America relative to urban unskilled wages in Britain.<sup>5</sup> More importantly, none of the wage relatives in Table 1 are calculated at the prevailing exchange rate. It is well-known that the use of exchange rates, dominated by tradable goods, is inferior to the use of purchasing-power-parity, the latter constructed from workers=market baskets. However, trying to construct PPP-adjusted real wages based on common market baskets and region-specific relative prices would entail another research project. Table 1 uses a shortcut: we take the 1910 PPP-adjusted GDP per capita estimates reported recently by Pablo Astorga and Valpy FitzGerald (1998: Table A-4, p. 31) as our benchmark and project our real wage series forward and backward from that point. To make the comparison with Britain, I use the 1910 PPP-adjusted urban unskilled real wages in Argentina and Britain reported in my previous work (Williamson 1995), and then adjust the remaining Latin American countries accordingly, a

procedure which assumes that the cardinal ranking of the Latin American countries relative to Argentina would be the same in 1910 for real unskilled urban wages and GDP per capita.

The Latin American real wage hierarchy around the turn of century is clear enough, and while some of the estimates in Table 1 seem to be consistent with other qualitative and quantitative accounts, some are quite surprising.

The Brazilian Northeast was at the bottom of the hierarchy, with workers' living standards only 5-8 percent of those in Britain. Conditions were dismal in this region which had only recently freed these workers from slavery and which had been beset with sagging prices of their key exportables (Leff 1972), but it is hard to imagine living standards being much lower. Perhaps they are understated. While the Brazilian Northeast and the Italian Mezzogiorno have always been cited as classic examples of regional dualism (Williamson 1965), wages in Brazil's poor Northeast were well below Italy's poor Mezzogiorno just prior to World War I, the former less than a third of the latter (Williamson 1998b: Table 1). Even unskilled construction workers in Egypt had almost double those real wages in Northeast Brazil. Furthermore, none of the unskilled workers in Asian cities and towns had real wages that low: they were more than double that in Burma and India (Williamson 1998a: Table 1).

Argentina and Uruguay were, of course, at the top of the heap, frequently switching the leadership position between the 1870s and 1910, but ending up about on par just prior to the Great War in Europe. Mexico and Cuba were next in line, two-thirds to three-quarters of the Southern Cone. Nowhere in Asia did real wages come close to those in Mexico and Cuba: the three most labor-scarce Asian countries in 1909-13 -- Japan, Korea and the Philippines -- had real wages less than half those of Cuba and Mexico. From there, it was a big step down to the real wages and living standards prevailing for the unskilled in Colombia (Bogata) and the Brazilian Southeast (Rio de Janeiro).

### **Real Wage Gaps Within Latin America: Convergence or Divergence?**

Table 1 suggests two additional facts worth noting. It is certainly true that the real wage estimates for 1909-1913 offer strong confirmation of the historical persistence of the wealth of nations. That is, the Latin American economic hierarchy changed very little in the eighty years after 1909-1913, at least as gauged by the five in Table 1 whose GDP per capita Astorga and FitzGerald (1998: Table A-4) can document between 1910 and 1990: only Brazil and Cuba switched their positions in the hierarchy during the 20th century. It appears that history and initial conditions have mattered a great deal in this century. However, the size of the gaps between these parts of Latin America diminished dramatically. In 1910, the five poorest countries whose GDP per capita can be documented were Brazil, Ecuador, Venezuela, Colombia and Peru, from poorest on up. Setting the average of the three richest countries -- Argentina, Chile and Cuba -- at 100, the five poorest had per capita incomes of 18.8, 25, 26.3, 33.4 and 34.3. In 1990, the same calculation, and in the same order, yields relative per capita incomes of 80.7, 53.2, 127.7, 76.7 and 50.9. Every single one of these five Latin American countries who were poorest eighty years ago began catching up with the richest three Latin American countries thereafter, and the collapse in the gap between the richest and poorest countries was quite significant.

So far, the evidence points to Latin American economic convergence in the 20th century. What happens if Mexico is added to the list (giving us nine observations) and a measure of dispersion,  $C(9)$ , is calculated for every census date from 1910 to the present? The results are plotted in Figure 3 and they confirm the cruder measures of convergence offered in the previous paragraph. Between 1910 and 1930, the dispersion index drops by more than a half, from about 0.40 to 0.19, a huge decline. The decline ceases between 1930 and 1970, after which it drops sharply again, to about 0.09 in 1990. Why did this 20th century convergence within Latin America take place in two steps, and why during those epochs?

Was there convergence within Latin America in the 19th century as well? Here we use our real wage data, which are plotted in Figures 4 and 5. True, the total number of countries in the 19th century sample is

smaller, and there are missing years in some of the time series. While the data are imperfect, Figure 6 patches together overlapping measures of C as best we can. The imperfect data seem to offer an unambiguous answer to the question at hand: If there was convergence across Latin America prior to 1914, it was modest. Indeed, C(4) and C(6) suggest divergence up to the 1890s, not convergence. There is some convergence between the mid-1890s and World War I suggested by C(5), so the 20th century convergence we see in Figure 3 may have had its source in the very late 19th century. Paul Krugman and Anthony Venables (1990, 1995) might view this inverted U-shaped pattern in Latin American real wage dispersion as support for their position that globalization is likely to cause divergence in early stages of development before it causes convergence in later stages. However, industrialization is central to the Krugman-Venables model: Did it hold for 19th century Latin America?

### **Real Wage Gaps Between Core and Periphery: What Happened to the Gap**

#### **Between Latin America and the Industrial Leaders During the First Great Globalization Boom?**

In spite of convergence within Latin America between 1910 and 1995, there was divergence between Latin America and the world leaders. All six parts of Latin America documented in Table 1 for 1909-13 lost ground relative to Britain in this century,<sup>6</sup> some of them a great deal of ground. But what about prior to the Great War? Was the 19th century different?

Table 3, Table 4 and Figure 7 all document that Argentina was catching up with Britain in the half-century before World War I. There is evidence that the Brazilian Southeast started catching up from mid-century. But catch up with the European leaders doesn't seem to have been taken place anywhere else in Latin America (see also Figure 8). Table 3 shows clearly that Colombia, Mexico and Uruguay were able to hold their own up to the Great War, but real wages there did not catch up with those in Britain. Nor is there any evidence of catch up in the Brazilian Northeast or in Cuba.



While there is very little evidence of Latin American catch up on the world's leaders prior to 1914, at least Latin America was able to hold its own. after the early 19th century. In contrast, there is plenty of evidence of fall back in the 20th century. Why the difference between the two centuries? What were the economic and demographic fundamentals present during the First Great Globalization Boom which were absent thereafter? The literature points, of course, to policy in accounting for the great divide. Relative to the world leaders, better growth performance in Latin America prior to the 1920s then afterwards seems to be highly correlated with an open policy on one side of that divide and a closed policy on the other. But any agenda whose goal is to isolate the role of policy in accounting for the different growth experience on either side of 1914 needs to control for everything else that might matter: demography, bad luck in world factor and commodity markets, the tyranny of distance and other forces.

### **Real Wage Gaps and Migration Between the Old and New World**

The fact that the Italian, Portuguese and Spanish emigrants were poor by western European standards, and that so many went to Latin America, has generated debate on the receiving end. Sir Arthur Lewis thought that his model of development (Lewis 1954) with immigrant-augmented elastic labor supplies applied to late 19th century Latin America (Lewis 1978a), and many Latin American scholars subsequently agreed. Carlos Diaz-Alejandro wrote that the labor supply in Argentina before 1930 was "perfectly elastic at the going wage (plus some differential) in the industrial centers of Italy and Spain" (1970: 21-2). Nathaniel Leff thought the same was true of the Brazilian Southeast and that elastic immigrant labor supplies could account for stable wages in Sao Paulo and Santos from the 1880s onwards (Table 2; Leff 1992: 6). If the elastic labor supply thesis is correct, then late 19th century Latin emigration should have been far more

responsive to wage gaps between home and abroad compared with the early emigrants from northwest Europe going to North America, Australia and New Zealand. The hypothesis is soundly rejected (Hatton and Williamson 1994; 1998: Chp. 3): Latin emigrants were no more responsive to wage gaps between home and abroad than was the case for other European emigrants. It is simply not true that the Latin economies in the late 19th century had more elastic emigrant labor supplies than the rest of Europe. This revisionist finding is consistent with Alan Taylor's (1994) research which shows that Argentina's immigration was no more responsive to wage gaps than was Australia's. This new evidence seems to do heavy damage to the arguments of Sir Arthur Lewis (1978a) and Carlos Diaz-Alejandro (1970) that Latin American development took place under uniquely elastic labor supplies.

Without the wage gaps favoring the more labor scarce parts of Latin America, the Mediterranean migrants would never have come. And they are certainly the ones which mattered. As Figure 9 suggests, the Latin American wage advantage over the Mediterranean Basin (a population weighted average of Italy, Portugal and Spain<sup>7</sup>) collapsed from the early 1890s to World War I. In fact, by 1918 there was very little real wage advantage that Argentina, Uruguay and Cuba had to offer potential emigrants from the Basin, and Mexico had fallen way behind. There was a lively Latin America rebound in the 1920s and 1930s, but the high wage leaders -- Cuba, Mexico and the Southern Cone -- never regained their late 19th century advantage. This is one reason why Latin American immigration rates fell off in the interwar decades; another reason, of course, was that the immigrating countries adopted less generous and even in some cases hostile policies towards the European emigrants (Timmer and Williamson 1998).

Prior to 1914, the size of the gaps also had an important impact on where the immigrants went in Latin America. Table 1 and Figure 9 suggest the biggest immigration rates should have been recorded by the Southern Cone, illustrated by Argentina and Uruguay. The next biggest rates should have been Cuba, followed by Mexico, followed far behind by the others. The problem is that the comparative immigration data for Latin America isn't good enough to perform a strict test of what seems to be a plausible hypothesis. Yet,

imperfect data in Table 6 confirm it. In the 1870s and 1880s, the immigration rates in Argentina were five to six times those of Brazil. Even if we assume that all the Brazilian immigrants went to the Southeast, the immigration rates to the Brazilian Southeast in the 1870s would still have been less than half that of Argentina.<sup>8</sup> By the first decade of the present century, Argentina had the highest immigration rates in the New World. Cuba was in second place, even higher than the United States. Brazil was in last place, one quarter of Cuba and one tenth of Argentina. As for the (poorly-documented) rest, Nicholas Sanchez-Albornoz (1974: 153-4) reports that the Mexican census of 1900 recorded only 0.5 percent foreign-born, the Venezuelan share was only 4 percent in 1891, and even the Chilean share was only 4.7 percent in 1907. It certainly seems like *the tide of migration ... flowed only toward the most developed areas* (Sanchez-Albornoz 1974: 154), and also, it might be added, the tide seemed to be deflected by the tyranny of distance.

There is, of course, another way to explore this correlation. Did high wage regions in Latin America have higher rates of population and labor force growth than low wage regions? The immigrations from Europe would have helped yield that result, as we have seen. But the domestic population response should have reinforced the immigration response: the more labor scarce and high wage regions should have encouraged couples to marry younger and to have more children, and the children were more likely to survive. Figure 10 confirms the hypothesis for the period 1850-1940: here the rate of population growth is regressed on the initial real wage; the estimated coefficient is 0.012, and the t-statistic is 2.220. Of course, the finding that high wages today encourages a positive labor supply response tomorrow does not necessarily imply a rejection of the Malthusian proposition that a swollen population today, with fixed resources, implies diminishing returns, declining real wages and living standards tomorrow. We will come back to this issue at the end of this section.

Thus, the fact that labor supplies to Argentina and Brazil were not perfectly or even uniquely elastic did not imply that the immigrations were small or that they failed to have an impact on population and labor force growth. However, there are other reasons why the migrations to the Southern Cone, at least, were mass.

A boom in the natural rate of population increase two decades earlier was a very powerful force serving to push up emigration rates in Italy and Portugal, experience on the upswing of the demographic transition that was replicated in the rest of Europe earlier in the century. While there was still a wage gap favoring the Southern Cone two to one, these demographic events were by far the most powerful forces accounting for the surge in Italian and Portuguese emigration rates after the 1880s. Spain, however, is an exception: rates of natural increase were falling in the 1870s and 1880s, not rising (Moreda 1987). If emigrant-inducing demographic forces were absent in Spain after the 1880s, why the rise in Spanish emigration rates? The answer seems to lie largely with economic failure at home. The wage gap between Spain and destination countries remained enormous: the ratio of Argentine to Spanish real wages was 2.3 in 1885, 3.1 in 1895, 3.6 in 1905 and 2.5 in 1913. This fact explains almost all of the surge in Spanish emigration. The same was true of Portugal, although the failure at home was not nearly as great. In contrast, Italian wages were catching up with those in destination countries -- Argentina, Germany and the United States -- and that wage success muted the surge in Italian emigration by partially offsetting those powerful emigrant-inducing demographic forces.

For all three Latin countries, there were additional underlying fundamentals that they shared and which served to contribute to the surge in emigration: modest rates of industrialization (e.g., slow rates of Agood@job creation) and rising migrant populations abroad which sent remittances home. Nonetheless, what really made the Latin countries different after the 1880s was the delayed demographic transition and the economic failure in Portugal and Spain. Furthermore, Sanchez-Alonso (1998) has stressed the role that policy played in creating an even poorer emigration environment in Spain. While the rest of the world stuck with the gold standard, Spain depreciated the peseta (and raised tariffs on cereals) so that Spanish agriculture could compete with foreign imports in the domestic market. This policy served to raise the demand for unskilled labor at home and to reduce emigration push.

So, it was not elastic labor supply responses to wage gaps that produced the mass migrations from

the Mediterranean to Argentina, Chile, Uruguay and the Brazilian Southeast. Rather, it was demographic events, poor policy and economic failure in the Mediterranean. And these mass migrations mattered, just as they did in so many other parts of the Atlantic Economy. The poorest European countries tended to have the highest emigration rates, the richest new world countries tended to have the highest immigration rates, while the European industrial leaders and the poorest new world laggards both tended to lie in the middle with net migration close to zero. Where we can measure it, big migrations translated into big labor force impact in both sending and receiving regions (Taylor and Williamson 1997; O'Rourke and Williamson 1997; Williamson 1998d): mass migration after 1870 served to augment the 1910 combined new world labor force in Argentina, Australia, Brazil, Canada, and the United States by an enormous 49 percent, to reduce the 1910 labor force in the emigrant countries around the poor European periphery (including Iberia and Italy) by a very large 22 percent, and, where the net migrations were much more modest, to reduce the 1910 labor force in the European industrial core by tiny 2 percent. Mass migration by itself probably explained about 70 percent of the real wage convergence in the late 19th century Atlantic economy (Taylor and Williamson, 1997; O'Rourke and Williamson, 1998, ch. 8).

This late 19th century Atlantic economy sample just discussed includes Argentina and Brazil, but no other Latin American countries. What role did mass migration play elsewhere in Latin America? Since we have already seen that the migration data is poor for the rest of Latin America, we will have to make do with cruder population data. While Figure 10 and Table 6 confirmed that rich Latin American countries had the highest rates of immigration and population growth, we now ask a different question: Did immigration and population growth tend to erode the wage advantage in the more labor scarce economies? To get an answer, we borrow from the new empirical growth theory and regress per annum real wage growth on the real wage at the start of the period (giving poor countries the chance to exhibit *catch-up* on the rich), the rate of population growth (giving diminishing returns a chance to exhibit its effects), and a dummy for the pre-1919 versus the post-1918 years (giving the boom and bust in the world economy a chance to have its influence on

growth performance in Latin America). The results for 1850-1940 are disappointing (estimated coefficient, with t-statistics in parentheses):

population growth	+1.790 (2.895)
initial real wage	- 0.015 (0.918)
dummy=1 if <1919	+2.974 (3.165)

In short, there is no evidence of catching up within Latin America (the sign is right on the initial real wage, but the t-statistic too low), the coefficient on the dummy variable confirms that growth was far faster before 1919 than after, and there is absolutely no evidence of diminishing returns (the significant coefficient on population growth is positive, not negative).

### **Wage-Rental Ratio Trends in Argentina**

Eli Heckscher and Bertil Ohlin argued that the integration of global commodity markets would lead to convergence of international factor prices, as countries everywhere expanded the production and export of commodities which used their abundant (and cheap) factor intensively. The only historical evidence for Latin America that I am aware of, wage-rental ratio trends from Argentina (O'Rourke, Taylor and Williamson 1996), seems to be consistent with Heckscher and Ohlin. They appear in Table 7.

The trade boom between the 1870s and World War I led to falling wage-rental ratios in relatively land-abundant Argentina, just as Heckscher and Ohlin would have predicted. As the exports of land-intensive products boomed, so did the demand for land and thus rents. As the imports of labor-intensive products also boomed, the demand for labor fell, at least relative to land, and thus so did the wage-rental ratio. Where 1913=1.0, the wage-rental ratio plunges from about 4.8 in 1883-1889 to about 0.6 in 1915-1919. Alternatively, the ratio of land rents to wages soared. As it turns out, these trends were typical everywhere in the land-abundant periphery, like Australia and North America, where the possibilities of trade with the European core was being exploited (O'Rourke, Taylor and Williamson 1996). Exactly the opposite trends

were taking place in Europe, especially in those parts of Europe which stuck to their free trade guns: i.e., wage-rental ratios soared in Britain, Ireland and Scandinavia. To the extent that land holdings were highly concentrated at the top, these trends clearly implied rising inequality in Argentina and falling inequality in Europe. Furthermore, when the world economy fell apart after World War I, the decline in the wage-rental ratio in Argentina stopped and actually began to rise in the 1930s (Table 7).

So much for factor demand and globalization. What about factor supply? As we pointed out above, W. Arthur Lewis (1954) used his famous labor surplus model to show how early industrialization could create inequality (and also a rising surplus to finance domestic-savings-constrained accumulation). Stable real wages implied rising profit shares economy-wide. According to his model, the worker fails to share in GDP per capita growth since elastic labor supplies keep wages and living standards stable. The Lewis model is quiet about what happens to land rents, but the classical model from which it was derived clearly predicted a rise. As we have seen, Diaz-Aljandro (1970), on Argentina, and Leff (1972; 1992), on Brazil, both have used the labor surplus model to predict stable real wages in Latin America, appealing to the migration of surplus labor from the Mediterranean. While the thesis that these parts of Latin America had more elastic labor supplies is rejected, they did have higher rates of immigration and labor force growth. This process of intensification may have suppressed real wage growth relative to other factor prices like land rents. Since the mass migrations into Argentina dropped sharply after World War I, that fact is consistent with the turnaround in the wage-rental ratio drift in Table 7.

It follows that the Heckscher-Ohlin globalization model and the Lewis labor-surplus model both predict falling wage-rental ratios and rising inequality in Latin America prior to World War I, and the opposite thereafter. Thus, discriminating empirically between these two competing views will prove difficult since both were at work. Regardless of which thesis explains Argentine history best, we need to know whether this experience was ubiquitous across Latin America.

## Hints and Hunches about Inequality Trends in Latin America

Complete income distributions at various benchmarks between the mid-19th century and World War II are unavailable for any Latin American country, including Argentina. But even if such data were available, it is not obvious that they would offer the best way to search for the underlying causes of changing inequality. Our interest here is factor prices: wages, rents and the structure of pay. How did the typical unskilled worker near the bottom of the distribution do relative to the typical landowner or capitalist near the top, or even relative to the typical skilled blue collar worker or educated white collar employee near the middle? The modern debate over OECD inequality has a fixation on wages, but since land and landed interests were far more important to late 19th century inequality trends -- especially in the more agrarian Latin America -- we need to add them to our distribution inquiry. In any case, we have two kinds of evidence available to document inequality trends in Latin America prior to 1940: trends in the wage-rental ratio, which we have already explored, but, sad to say, are limited to Argentina; and trends in the ratio of the unskilled wage to GDP per capita, which we have not yet explored, and which are available for seven Latin American regions between 1870 and 1940.

Table 8 reports trends in the ratio of the unskilled worker's wage ( $w$ ) to the returns on all factors per person as measured by Maddison's (1995) and Astorga and FitzGerald's (1998) estimates of GDP per capita ( $y$ ). True, the ratio could be influenced by changes in the labor participation rate alone. If there was a sharp increase in population from, say, a rise in fertility and thus no increase in workers of adult age,  $w/y$  would (spuriously) rise. That is, nothing would happen to the wage or to GDP, but GDP per capita would fall. In contrast, if there was a sharp increase in population from the immigration of adult labor,  $w/y$  would fall, since the adult immigrants would tend to lower wages but increase per capita income as labor participation rates rose. Thus, the pre-WWI immigration into Latin America probably tends to make  $w/y$  trends overstate rising inequality there. Still, trends in  $w/y$  should approximate changes in the economic distance between the



working poor near the bottom of the distribution and the average citizen in the middle of the distribution.<sup>9</sup>

Table 8 shows that any successful explanation of changes in  $w/y$  in Asia between 1870 and 1940 will have to be complex: the Heckscher-Ohlin trade model and the Lewis labor surplus will not, by themselves, account for all the variety.

Argentina, Mexico and Uruguay document the longest time series, and Table 8 shows that they share the same trends. They all underwent a long, steep decline in  $w/y$  before it flattened out or even rose after World War I. The turning point for all three is 1915-1919, a result consistent with Argentina's wage-rental ratio trends in Table 7. Although its time series is shorter, Cuba seemed to obey the same laws of motion and the same turning point. Colombia's time series is even shorter than Cuba's, so we do not know whether 1910-1914 was a turning point for Colombia or not. The only evidence in Table 8 inconsistent with either the Heckscher/Ohlin or the Lewis explanations is Brazil, which underwent a steady decline in  $w/y$  from the turn of the century onwards. The behavior of this inequality proxy can be best summarized for all of Latin America by pooling the annual data underlying the five-year averages in Table 8. The results of a non-linear regression are plotted in Figure 11,<sup>10</sup> and the predicted time when  $w/y$  reached a minimum is 1918-1919.

Why did the real wage lag behind GDP per capita in so much of Latin America during the First Great Globalization Boom? Is this evidence of some weaker version of the Lewis model, no constant wage but rather sluggish wage growth and modest trickling down? Is it evidence supporting the factor-price convergence theorem? Or is it both? And why the common turning point for economies with such different attributes? Since it seems unlikely that such dissimilar economies could share the same Lewis labor supply turning point, perhaps a more likely explanation lies with world markets. These countries were more likely to have shared similar price shocks which produced the same trends in  $w/y$ .

We have found an important Latin American stylized fact. Real wages lagged behind GDP per capita growth everywhere in Latin America up to the World War I decade. Real wages outstripped GDP per capita growth thereafter. We interpret these trends as a proxy for rising inequality during the First Great

Globalization Boom and falling inequality during the interwar years. What accounts for this stylized fact?

This paper will duck this question, adding it to that lengthening agenda, but it should be noted that the same stylized fact appears in Asia (Williamson 1998a).

### **An Agenda**

This real wage data base has served us well in generating a research agenda for the economic performance of Latin America over the century before 1940.

By focusing on relative growth performance within Latin America, rather than between Latin America and the European OECD or the United States, two stylized facts have emerged that need explanations. Across the 20th century, Latin America has undergone dramatic convergence: living standards in poor countries have been catching up with those in rich. How much of this has been due to economic failure among the rich, and how much to economic success among the poor? And why did all of the convergence take place in two discrete steps, 1910-1930 and 1970-1990? Do these two periods have enough in common to offer a common explanation for both? The 19th century was different: living standard gaps between rich and poor parts of Latin America widened up to the 1890s, while they narrowed thereafter. Why? Can the Krugman-Venables model account for the inverted-U?

Any effort to confront these two stylized facts must augment the quality and coverage of those explanatory variables which have had success more generally in the new growth literature. In particular, any agenda whose goal it is to isolate the role of policy in accounting for these trends, needs to control for demography, the luck of the draw in world commodity markets, the breakdown of the tyranny of distance, the rise and fall of integrated world factor markets, and other forces.

Trends in the wage-rental ratio and in the wage/GDP-per-capita ratio have produced a third stylized fact. Both of these ratios trend steeply downwards to World War I, then trend upwards immediately thereafter. Why? Since both of these measures are proxies for inequality, they take on even greater

importance. So, what accounts for this stylized fact, a fact that has been recently discovered in Asia too? Is it the consequence of the Heckscher-Ohlin model? If so, is it world price shocks doing the work, or is it instead changes in attitudes towards globalization, open prior to World War I and closed thereafter?

Alternatively, was factor accumulation doing the work, the heavy immigration of capital and labor combining with less elastic land prior to World War I, while the opposite thereafter? In short, was it commodity markets or factor markets which accounted for that inequality turning point? Or was it something else?

**Table 1**

**The Latin American Real Wage Hierarchy Near the Turn of the Century**

Region	Real Wage Relative to Great Britain (in percent)		
	1873-1883	1899-1903	1909-1913
Argentina	74.2	100.9	97.9
Brazil, Southeast	18.8	18.3	22.0
Brazil, Northeast	5.2	5.0	7.7
Colombia	17.3	26.2 ***	24.5
Cuba			73.9
Mexico	67.3 *	58.2	65.3
Uruguay	97.0 **	82.0	97.4

Sources and Notes: The Latin American data are from Appendix Tables 1-6, PPP-adjusted with Great Britain in 1913=100 in Appendix Table 7.2. The British data is taken from my revised Atlantic economy data base (Williamson 1995; revised in O'Rourke and Williamson 1997).

\* As the Mexico real wage series starts only in 1877, this entry reports an average for 1877-1883.

\*\* As the Uruguay real wage series starts only in 1880, this entry reports an average for 1880-1883.

\*\*\* As the Colombia real wage series excludes the years 1901-1908 because of hyperinflation in the country, this entry reports an average for 1899-1900.

**Table 2**

**Real Wage Performance in Latin America, 1830-1939**

(1913=100)

Period	Argentina	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
1830-1834		38.0					
1835-1839		34.6					
1840-1844		36.3					
1845-1849		36.1					
1850-1854		45.9					
1855-1859		45.1	40.0				
1860-1864		53.3	73.2				
1865-1869	55.6	50.4	74.2	100.8			
1870-1874	61.4	53.0	63.8	83.2			
1875-1879	54.3	65.3	62.7	70.8			
1880-1884	69.0	73.2	57.7	84.0		70.2	88.5
1885-1889	82.8	84.0	53.2	119.7		69.9	115.6
1890-1894	90.8	71.6	49.0	133.7		72.3	135.0
1895-1899	97.7	72.9	54.6	155.5		79.1	113.7
1900-1904	111.3	94.0	86.6	--		80.1	104.5
1905-1909	98.4	103.4	112.1	--	107.4	82.0	103.0
1910-1914	101.8	102.2	110.2	130.0	99.5	76.8	105.2
1915-1919	76.1	76.6	70.6	158.9	92.4	30.7	73.9
1920-1924	110.6	68.4	58.9	194.2	117.5	38.5	110.9
1925-1929	135.9	80.9	60.4	252.9	136.0	49.9	128.6
1930-1934	139.3	97.1	44.9	375.4	141.1	60.7	145.4
1935-1939	138.6			302.4	135.0	48.6	137.4

Sources: Appendix Tables 1-6.

**Table 3**

**Real Wage in Latin America Relative to Great Britain, 1830-1939**  
(in percent)

Period	Argentina	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
1830-1834		14.9					
1835-1839		14.1					
1840-1844		14.0					
1845-1849		13.2					
1850-1854		16.2					
1855-1859		16.8	4.4				
1860-1864		20.4	8.3				
1865-1869	81.8	17.2	7.6	28.6			
1870-1874	86.5	17.3	6.2	22.6			
1875-1879	65.8	18.2	5.2	16.3			
1880-1884	81.2	19.9	4.7	19.0		66.5	95.4
1885-1889	85.3	20.0	3.8	23.8		58.1	109.2
1890-1894	87.8	16.1	3.3	25.0		56.4	119.2
1895-1899	85.9	14.8	3.3	26.3		56.0	91.8
1900-1904	101.0	19.7	5.4	--		58.4	86.8
1905-1909	92.0	22.3	7.2	--	76.2	61.7	88.2
1910-1914	100.8	23.4	7.4	24.8	74.8	60.6	95.2
1915-1919	91.1	21.5	5.8	36.9	84.3	30.0	81.0
1920-1924	103.9	14.8	3.8	35.0	84.0	29.1	95.3
1925-1929	125.5	17.2	3.8	44.9	95.3	37.0	108.7
1930-1934	116.6	18.8	2.6	60.5	89.9	40.7	111.4
1935-1939	115.2			48.4	85.1	32.4	104.4

Sources and Notes: See notes to Table 1.

**Table 4**

**Real Wage Performance in Latin America by Decades Relative to Great Britain and the Mediterranean Basin, 1830s-1930s**

Period	Argentina	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
--------	-----------	-------------------	-------------------	----------	------	--------	---------

**A. Relative to Great Britain**

1830s		14.5					
1850s		16.5					
1870s	76.2	17.7	5.7	19.5			
1890s	86.8	15.5	3.3	25.7		56.2	105.5
1909-1913	97.9	22.0	7.7	24.5	73.9	65.3	97.4
1930s	115.9			54.4	87.5	36.6	107.9

**B. Relative to Weighted Average of Italy, Portugal, and Spain**

1830s		30.5					
1850s		35.8					
1870s	207.7	48.9	15.5	53.1			
1890s	267.8	47.5	10.1	79.1		173.2	324.8
1909-1913	212.1	47.8	16.8	53.1	160.5	140.9	211.5
1930s	201.1			94.4	152.2	63.0	187.0

**C. Per Annum Growth Rate (%)**

1830s-1850s		1.27					
1850s-1870s		1.50					
1870s-1890s	3.15	1.11	-0.90	4.39			
1890s-1909/13	0.46	2.24	7.58	-0.55		0.67	-0.69
1909/13-1930s	1.58			6.72	1.56	-1.49	1.20

Sources and Notes: For panel A, see notes to Table 1. For panel B, see Appendix Table 7.4 for PPP-adjusted Latin American real wages where emigrating Mediterranean countries in 1913=100. The real wage series for the emigrating Mediterranean countries (Italy, Portugal, and Spain) is a weighted average of the respective real wage indices of these three countries, where the weights used were the 1913 populations of these countries found in Maddison 1995. For more details, see the text preceding Appendix Table 7.4. Panel C is based on the real wage data in Appendix Tables 1-6.

**Table 5**  
**Real Wages in Latin America Relative to Argentina, 1830-1939**  
**(in percent)**

Period	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
1865-1869	21.0	9.2	35.0			
1870-1874	20.2	7.2	26.2			
1875-1879	28.3	8.1	26.1			
1880-1884	25.1	5.9	24.2		84.3	120.7
1885-1889	24.0	4.5	28.6		69.9	131.1
1890-1894	19.1	3.8	29.3		66.2	137.5
1895-1899	17.8	3.8	31.0		66.2	111.5
1900-1904	19.5	5.3	--		57.9	86.0
1905-1909	24.3	7.8	--	82.9	67.1	95.9
1910-1914	23.2	7.4	24.6	74.2	60.4	94.5
1915-1919	23.2	6.4	40.8	92.9	32.5	90.2
1920-1924	14.4	3.7	33.9	79.8	27.8	92.2
1925-1929	13.7	3.1	35.7	76.0	29.5	86.7
1930-1934	16.1	2.2	51.8	77.2	34.9	95.6
1935-1939			42.0	74.0	28.1	90.7

Source: Appendix Table 7.1.



**Table 6**

**New World Immigration Rates by Decade (per 1000 mean population)**

---

Country	1851-60	1861-70	1871-80	1881-90	1891-00	1901-10
<b>Latin America</b>						
Argentina	38.5	99.1	117.0	221.7	163.9	291.8
Brazil			20.4	41.1	72.3	33.8
Cuba						118.4
<b>Other New World</b>						
Australia		122.2	100.4	146.9	7.3	9.9
Canada	99.2	83.2	54.8	78.4	48.8	167.6
United States	92.8	64.9	54.6	85.8	53.0	102.0

---

**Source:** Hatton and Williamson (1998: Table 2.2) based on Ferenczi and Willcox (1929: 209); Taylor (1992: Appendix Table 1.A2).

**Table 7**

**Argentine Wage/Land Value Ratio Trends, 1883-1940  
(1913=1.00)**

<b>Period</b>	<b>Argentina Wage/Land Value Ratio</b>
1883-1889	4.8418
1890-1894	4.3427
1895-1899	3.7043
1900-1904	3.4503
1905-1909	1.6100
1910-1914	1.0001
1915-1919	0.6379
1920-1924	0.6324
1925-1929	0.6072
1930-1934	0.6951
1935-1939	0.7089

Source: Appendix Table 1.4.

**Table 8**  
**Wage/GDP Per Capita Ratio Trends, 1870-1939**  
**(1913=1.00)**

<b>Period</b>	<b>Argentina</b>	<b>Brazil, Southeast</b>	<b>Brazil, Northeast</b>	<b>Colombia</b>	<b>Cuba</b>	<b>Mexico</b>	<b>Uruguay</b>
1870-1874	1.6947						
1875-1879	1.3286						
1880-1884	1.4769					1.1881	1.9047
1885-1889	1.5663					1.0899	2.2004
1890-1894	1.5191					1.0387	2.2555
1895-1899	1.4428					1.0503	1.6946
1900-1904	1.4570	1.2209	1.5325			0.9702	1.3658
1905-1909	1.0500	1.1529	1.4431		1.2108	0.8633	1.0966
1910-1914	1.0433	1.0318	1.1451	1.3317	0.9924	0.7738	1.0759
1915-1919	0.9230	0.7899	0.6751	1.5811	0.9329	0.2982	0.8981
1920-1924	1.1298	0.6280	0.5383	1.9191	1.2210	0.3615	1.1346
1925-1929	1.2440	0.5912	0.5361	2.2206	1.4785	0.4613	1.1785
1930-1934	1.4144	0.5760	0.3652	3.0818	1.5704	0.6903	1.4745
1935-1939	1.3032			2.0995	1.4853	0.5129	1.2918

Sources: GDP per capita data for Argentina, Colombia, and Mexico are from Maddison 1995, while the information for Cuba is from Astorga and FitzGerald 1998. Income per capita estimates for the regions of Brazil are from Gomes 1986. Note that even though the PPP-adjustment benchmarks for Appendix 7 were based only on Astorga and FitzGerald, we have used the Maddison source of GDP per capita data here as it extends coverage for more years. (Astorga and FitzGerald offer only decadal coverage.) These GDP per capita figures were interpolated where necessary and rebased so that 1913=100. The real wage data are from Appendix Tables 1-6.

**Table 9**

**Regional Real Wage Indices for Brazil, 1855-1935**  
(SE -- Southeast; NE -- Northeast)

<b>Period</b>	<b>Average of (SE-NE)/NE ratio</b>
1855-1859	2.89
1860-1864	1.57
1865-1869	1.35
1870-1874	1.80
1875-1879	2.51
1880-1884	3.28
1885-1889	4.33
1890-1894	3.92
1895-1899	3.64
1900-1904	2.65
1905-1909	2.13
1910-1914	2.19
1915-1919	2.61
1920-1924	2.92
1925-1929	3.64
1930-1935	6.03

Sources and Notes: The real wage series used for the calculations were PPP-adjusted. See Appendix Table 7.2.

## References

- Allen, R. [1998], **The Great Divergence: Wages and Prices from the Middle Ages to the First World War**, paper presented to the **Conference on Regions**, Queens University, Kingston, Canada (March 6-7).
- Astorga, P. and V. FitzGerald [1998], **The Standard of Living in Latin America During the Twentieth Century**, **Development Studies Working Paper N. 117**, Queen Elizabeth House, St. Antony's College, University of Oxford (May).
- Blainey, G. [1966], **The Tyranny of Distance: How Distance Shaped Australia's History** (Melbourne: Macmillan, revised 1982 ed.).
- Brading, C. W. [1969], **Un analisis comparativo del costo de la vida en diversas capitales de hispanoamerica**, **Boletin Historico de la Fundacion John Boulton** 20 (March 1969): 229-63.
- Bulmer-Thomas, V. [1994], **The Economic History of Latin America Since Independence** (Cambridge: Cambridge University Press).
- Coatsworth, J. [1981], **Growth Against Development -- The Economic Impact of Railroads in Porfirian Mexico** (Dekalb, Ill.: Northern Illinois University Press).
- [1993], **Notes on the Comparative Economic History of Latin America and the United States**, in W. L. Bernecker and H. W. Tobler (eds.), **Development and Underdevelopment in America: Contrasts of Economic Growth in North and Latin America in Historical Perspective** (New York).
- Diaz-Alejandro, C. F. [1970], **Essays on the Economic History of the Argentine Republic** (New Haven, Conn.: Yale University Press).
- Engerman, S. L. and K. L. Sokoloff [1996], **Factor Endowments, Institutions, and Differential Paths of Growth Among New World Economies: A View from Economic Historians of the United States**, in S. Haber (ed.), **How Latin America Fell Behind** (Stanford, Cal.: Stanford University Press).
- Ferenczi, I. and W. F. Willcox [1929], **International Migrations**, Vol. I (New York: National Bureau of

- Economics Research).
- Fletcher, M. E. [1958], "The Suez Canal and World Shipping, 1869-1914," **Journal of Economic History** 18: 556-73.
- Gerschenkron, A. [1952], "Economic Backwardness in Historical Perspective," in B. Hoselitz (ed.), **The Progress of Underdeveloped Areas** (Chicago: University of Chicago Press).
- Harley, C. K. [1980], "Transportation, the World Wheat Trade, and the Kuznets Cycle, 1850-1913," **Explorations in Economic History** 17 (July): 218-50.
- [1988], "Ocean Freight Rates and Productivity, 1740-1913: The Primacy of Mechanical Invention Reaffirmed," **Journal of Economic History** 48: 851-76.
- Hatton, T. J. and J. G. Williamson [1994], "Late-Comers to Mass Emigration: The Latin Experience," in T. J. Hatton and J. G. Williamson (eds.), **Migration and the International Labor Market, 1850-1939** (London: Routledge).
- [1998], **The Age of Mass Migration: Causes and Economic Impact** (New York: Oxford University Press).
- Krugman, P. [1991a], **Geography and Trade** (Cambridge, Mass.: MIT Press).
- [1991b], "Increasing Returns and Economic Geography," **Journal of Political Economy** 99, 3: 483-99.
- Krugman, P. R. and A. Venables [1990], "Integration and the Competitiveness of Peripheral Industry", in Bliss, C. and J. Braga de Macedo (eds.), **Unity with Diversity in the European Community** (Cambridge: Cambridge University Press): 56-77.
- [1995], "Globalization and the Inequality of Nations", **NBER Working Paper** 5098, National Bureau of Economic Research, Cambridge, Mass. (April).
- Leff, N. H. [1972], "Economic Development and Regional Inequality: Origins of the Brazilian Case," **Quarterly Journal of Economics** LXXXVI, 2 (May): 243-62.
- [1992], "Economic Development in Brazil, 1822-1913," **First Boston Working Paper** FB-92-02,

- Columbia University.
- Lewis, W. A. [1954], "Economic Development with Unlimited Supplies of Labour," **Manchester School of Economic and Social Studies** 22: 139-91.
- [1969], **Aspects of Tropical Development** (Uppsala: Wiksell).
- [1978a], **The Evolution of the International Economic Order** (Princeton, N.J.: Princeton University Press).
- [1978b], **Growth and Fluctuations 1870-1913** (Cambridge: Allen and Unwin).
- Maddison, A. [1991], **Dynamic Forces in Capitalist Development** (Oxford: Oxford University Press).
- [1995], **Monitoring the World Economy 1820-1992** (Paris: OECD Development Centre Studies).
- Mokyr, J. [1990], **The Lever of Riches: Technological Creativity and Economic Progress** (New York: Oxford University Press).
- Moreda, V. P. [1987], "Spain's Demographic Modernization, 1800-1930," in N. Sanchez-Albornoz (ed.), **The Economic Modernization of Spain, 1830-1930** (New York: New York University Press).
- Newland, C. [1998], "Economic Development and Population Change: Argentina 1810-1870," in J. Coatsworth and A. Taylor (eds.), **Latin America and the World Economy Since 1800** (Cambridge, Mass.: Harvard University Press).
- North, D. C. [1958], "Ocean Freight Rates and Economic Development 1750-1913," **Journal of Economic History** 18: 538-55.
- O'Rourke, K. H. [1997], "The European Grain Invasion, 1870-1913," **Journal of Economic History** 57 (December): 775-801.
- O'Rourke, K. H.; A. M. Taylor; and J. G. Williamson [1996], "Factor Price Convergence in the Late 19th Century," **International Economic Review** 37: 499-530.
- O'Rourke, K. H. and J. G. Williamson [1994], "Late 19th Century Anglo-American Factor Price Convergence: Were Heckscher and Ohlin Right?" **Journal of Economic History** 54 (December):

892-916.

--- [1997], **Around the European Periphery 1870-1913: Globalization, Schooling and Growth**, **European Review of Economic History** 1: 153-90.

--- [1998], **Globalization and History** (Cambridge, Mass.: MIT Press, forthcoming).

Parthasarathi, P. [1998], **Rethinking Wages and Competitiveness in the Eighteenth Century: Britain and South India**, **Past and Present** 158: 79-109.

Pomeranz, K. [1997], **Re-thinking 18<sup>th</sup> Century China: A High Standard of Living and Its Implications**, paper presented to the All-UC Group in Economic History **Conference on Rethinking the History of Wages, Prices and Living Standards**, Davis, California (November 14-16).

Radalet, S., J. Sachs and J.-W. Lee [1997], **Economic Growth in Asia**, Chp. 2 in **Emerging Asia** (Manila: Asian Development Bank).

Sachs, J. D. and A. Warner [1995], "Natural Resource Abundance and Economic Growth," **NBER Working Paper** No. 5398, National Bureau of Economic Research, Cambridge, Mass. (December).

Sanchez-Albornoz, N. [1974], trans. by W. Richardson, **The Population of Latin America: A History** (Berkeley, California: University of California Press).

Sanchez-Alonso, B. [1998], **What Slowed Down the Mass Migration from Spain in the Late Nineteenth Century?**, paper presented to the **Conference on Long Run Economic Change in the Mediterranean Basin**, Istanbul, Turkey (June 4-7).

Taylor, A. M. [1992], **Argentine Economic Growth in Comparative Perspective**, PhD thesis, Department of Economics, Harvard University.

--- [1994], "Mass Migration to Distant Southern Shores," in T. J. Hatton and J. G. Williamson (eds.), **Migration and the International Labor Market, 1850-1939** (London: Routledge).

Taylor, A. M., and J. G. Williamson [1997], "Convergence in the Age of Mass Migration," **European Review of Economic History** 1: 27-63.



- Timmer, A. S. and J. G. Williamson [1998], **Immigration Policy Prior to the Thirties: Labor Markets, Policy Interactions and Globalization Backlash**, **Population and Development Review** (forthcoming).
- Williamson, J. G. [1965], "Regional Inequality and the Process of National Development," **Economic Development and Cultural Change** 13, 4, pt. II (July), Supplement.
- [1995], "The Evolution of Global Labor Markets Since 1830: Background Evidence and Hypotheses," **Explorations in Economic History** 32: 141-96.
- [1996], **Globalization, Convergence and History**, **Journal of Economic History** 56: 277-306.
- [1997], **Globalization and Inequality, Past and Present**, **World Bank Research Observer** 12: 117-35.
- [1998a], **Real Wages and Relative Factor Prices in the Third World 1820-1940: Asia**, **HIER Discussion Paper No. 1844**, Department of Economics, Harvard University (August).
- [1998b], **Real Wages and Relative Factor Prices in the Third World 1820-1940: The Mediterranean Basin**, **HIER Discussion Paper No. 1842**, Department of Economics, Harvard University (July).
- [1998c], **Real Wages and Relative Factor Prices in the World Economy 1820-1940**, paper to be presented to the **Conference on 20th Century Growth**, Valencia, December 13-14.
- [1998d], **Growth, Distribution and Demography: Some Lessons from History**, **Explorations in Economic History** 35: 241-71.
- Wood, A. [1994], **North-South Trade, Employment and Inequality: Changing Fortunes in a Skill-Driven World** (Oxford: Clarendon Press).

**Table 1**

**The Latin American Real Wage Hierarchy Near the Turn of the Century**

Region	Real Wage Relative to Great Britain (in percent)		
	1873-1883	1899-1903	1909-1913
Argentina	65.6	89.3	86.8
Brazil, Southeast	32.4	31.8	38.2
Brazil, Northeast	9.1	8.7	13.4
Colombia	15.4	23.3**	21.7
Cuba			65.6
Mexico	64.8*	52.8	58.2
Uruguay	101.0	71.2	95.3

Sources and Notes: The Latin American data are from Appendix Tables 1-6, PPP-adjusted with Great Britain in 1913=100 in Appendix Table 7.2. The British data is taken from my revised Atlantic economy database (Williamson 1995; revised in O'Rourke and Williamson 1997).

\* As the Mexico real wage series starts only in 1877, this entry reports an average for 1877-1883.

\*\* As the Colombia real wage series excludes the years 1901-1908 because of hyperinflation in the country, this entry reports an average for 1899-1900.

**Table 2****Real Wage Performance in Latin America, 1830-1939 (1913=100)**

Period	Argentina	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
1830-1834		37.9					
1835-1839		34.5					
1840-1844		35.8					
1845-1849		36.2					
1850-1854		46.1					
1855-1859		44.3	40.0				
1860-1864		52.9	73.2				
1865-1869	55.8	50.0	74.2	100.8			
1870-1874	61.0	52.9	63.8	83.2			108.0
1875-1879	54.5	65.0	62.7	70.8			89.9
1880-1884	69.1	72.4	57.7	84.0		77.0	87.1
1885-1889	83.3	83.3	53.2	119.7		72.1	101.5
1890-1894	90.6	71.6	49.0	133.7		80.7	124.0
1895-1899	97.5	72.8	54.6	155.5		85.7	99.9
1900-1904	111.5	94.1	86.6	--		84.2	91.9
1905-1909	98.5	103.1	112.1	--	107.4	87.9	100.6
1910-1914	102.0	102.0	110.2	130.0	99.5	81.0	105.5
1915-1919	75.9	76.2	70.6	158.9	92.4	44.2	72.2
1920-1924	110.6	68.1	58.9	194.2	117.5	60.6	104.3
1925-1929	136.0	80.7	60.4	252.9	136.0	77.5	119.1
1930-1934	139.7	97.1	44.9	375.4	141.1	100.4	134.4
1935-1939	139.0			302.4	135.0	80.4	127.0

Sources: Appendix Tables 1-6.

**Table 3****Real Wage in Latin America Relative to Great Britain, 1830-1939 (in percent)**

Period	Argentina	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
1830-1834		25.7					
1835-1839		24.5					
1840-1844		23.9					
1845-1849		22.9					
1850-1854		28.1					
1855-1859		28.6	7.6				
1860-1864		35.2	14.5				
1865-1869	72.5	29.6	13.1	25.4			
1870-1874	76.0	30.0	10.7	20.1			136.7
1875-1879	58.4	31.4	9.0	14.5			97.2
1880-1884	71.8	34.2	8.1	16.9		64.0	91.8
1885-1889	75.9	34.5	6.5	21.1		52.6	93.8
1890-1894	77.4	27.9	5.7	22.2		55.2	107.3
1895-1899	75.8	25.7	5.7	23.4		53.3	78.9
1900-1904	89.4	34.2	9.4	--		53.9	74.7
1905-1909	81.4	38.6	12.5	--	67.6	58.1	84.3
1910-1914	89.2	40.6	12.9	22.0	66.3	56.3	93.3
1915-1919	80.3	37.1	10.1	32.7	74.8	37.8	77.6
1920-1924	91.8	25.5	6.6	31.1	74.6	40.3	87.7
1925-1929	111.0	29.9	6.7	39.8	84.6	50.5	98.4
1930-1934	103.4	32.6	4.5	53.7	79.8	59.1	100.7
1935-1939	102.1			42.9	75.5	47.1	94.4

Sources and Notes: See notes to Table 1.

**Table 4****Real Wage Performance in Latin America by Decades Relative to Great Britain and the Mediterranean Basin, 1830s-1930s**

Period	Argentina	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
<b>A.- Relative to Great Britain</b>							
1830s		25.1					
1850s		28.3					
1870s	67.2	30.7	9.9	17.3			116.9
1890s	76.6	26.8	5.7	22.8		54.3	93.1
1909-1913	86.8	38.2	13.4	21.7	65.6	58.2	95.3
1930s	102.7			48.3	77.7	53.1	97.6
<b>B.- Relative to Weighted Average of Italy, Portugal and Spain</b>							
1830s		52.7					
1850s		61.6					
1870s	183.1	84.4	27.0	47.1			318.0
1890s	236.0	82.4	17.5	70.1		167.1	286.1
1909-1913	187.9	82.7	29.1	47.1	142.3	125.6	206.7
1930s	178.1			83.7	135.0	91.3	168.9
<b>C.- Per Annum Growth Rate (%)</b>							
1830s-1850s		1.24					
1850s-1870s		1.52					
1870s-1890s	3.15	1.13	-0.90	4.39			0.66
1890s-1909/13	0.49	2.23	7.58	-0.55		0.16	-0.09
1909/13-1930s	1.58			6.72	1.56	0.24	0.79

**Sources and Notes:** For Panel A, see notes to Table 1. For Panel B, see Appendix Table 7.4 for PPP-adjusted Latin American real wages where emigrating Mediterranean countries in 1913=100. The real wages series for the emigrating Mediterranean countries (Italy, Portugal, and Spain) is a weighted average of the respective real wages indices of these three countries, where the weights used were the 1910 populations of these countries found in Maddison 1995. For more details, see the text preceding Appendix Table 7.4. Panel C is based on the real wage data in Appendix Tables 1-6.

**Table 5****Real Wages in Latin America Relative to Argentina, 1830-1939 (in percent)**

Period	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
1865-1869	40.9	18.1	35.1			
1870-1874	39.7	14.2	26.5			180.7
1875-1879	55.3	15.8	26.1			169.8
1880-1884	48.7	11.7	24.3		92.0	131.4
1885-1889	46.5	8.9	28.6		71.6	127.2
1890-1894	37.5	7.6	29.4		73.0	140.5
1895-1899	35.1	7.6	31.2		72.1	108.7
1900-1904	38.4	10.5	--		60.4	83.6
1905-1909	47.5	15.4	--	83.1	71.4	103.7
1910-1914	45.5	14.5	24.6	74.5	63.3	104.7
1915-1919	45.4	12.6	41.1	93.4	46.5	97.4
1920-1924	28.1	7.3	34.0	80.1	43.1	95.9
1925-1929	26.9	6.0	35.8	76.2	45.3	88.7
1930-1934	31.6	4.3	51.9	77.3	57.1	97.5
1935-1939			42.1	74.1	46.1	92.6

Source: Appendix Table 7.1

**Table 6****New World Immigration Rates by Decades (per 1000 mean population)**

Country	1851-60	1861-70	1871-80	1881-90	1891-00	1901-10
Latin America						
Argentina	38.5	99.1	117.0	221.7	163.9	291.8
Brazil			20.4	41.1	72.3	33.8
Cuba						118.4
Other New World						
Australia		122.2	100.4	146.9	7.3	9.9
Canada	99.2	83.2	54.8	78.4	48.8	167.6
United States	92.8	64.9	54.6	85.8	53.0	102.0

Source: Hatton and Williamson (1998: Table 2.2) based on Ferenczi and Willcox (1929:209); Taylor (1992: Appendix Table 1.A2.)

**Table 7**

**Argentina and Uruguay Wage/Land Value Trends, 1870-1940 (1913=1.00)**

Period	Argentina Wage/Land Value Ratio	Uruguay Wage/Land Value Ratio
1870-1874		11.1248
1875-1879		8.9130
1880-1884		7.2825
1885-1889	4.0139	4.0021
1890-1894	4.3427	3.7719
1895-1899	3.7043	3.0361
1900-1904	3.4503	2.3299
1905-1909	1.6100	1.6777
1910-1914	1.0001	1.1788
1915-1919	0.6379	1.2083
1920-1924	0.6324	1.5026
1925-1929	0.6072	1.5018
1930-1934	0.6951	1.7434
1935-1939	0.7089	2.1353

Source: Appendix Tables 1.4 and 6.4



**Table 8****Wage/GDP Per Capita Ratio Trends, 1870-1939 (1913=1.00)**

Period	Argentina	Brazil, Southeast	Brazil, Northeast	Colombia	Cuba	Mexico	Uruguay
1870-1874	1.6838						2.9816
1875-1879	1.3337						2.1923
1880-1884	1.4787					1.3047	1.8745
1885-1889	1.5765					1.1240	1.9366
1890-1894	1.5159					1.1592	2.0758
1895-1899	1.4400					1.1392	1.4892
1900-1904	1.4600	1.2229	1.5325			1.0198	1.2026
1905-1909	1.0509	1.1493	1.4431		1.2108	0.9263	1.0709
1910-1914	1.0444	1.0302	1.1451	1.3317	0.9924	0.8157	1.0783
1915-1919	0.9211	0.7863	0.6751	1.5811	0.9329	0.4300	0.8773
1920-1924	1.1302	0.6251	0.5383	1.9191	1.2210	0.5683	1.0671
1925-1929	1.2457	0.5898	0.5361	2.2206	1.4785	0.7187	1.0909
1930-1934	1.4186	0.5761	0.3652	3.0818	1.5704	1.1419	1.3630
1935-1939	1.3067			2.0995	1.4853	0.8485	1.1942

Sources: GDP per capita data for Argentina, Colombia, and Mexico are from Maddison 1995, while the information for Cuba is from Astorga and Fitzgerald 1998. Income per capita estimates for the regions of Brazil are from Gomez 1986. Note that even though some of the PPP-adjustments benchmarks for Appendix 7 were based only on Astorga and Fitzgerald, we have used the Maddison source of GDP per capita data here as it extends coverage for more years (Astorga and Fitzgerald offer only decadal coverage). These GDP per capita figures were interpolated where necessary and rebased so that 1913=100. The real wage data are from Appendix Tables 1-6.

**Table 9**

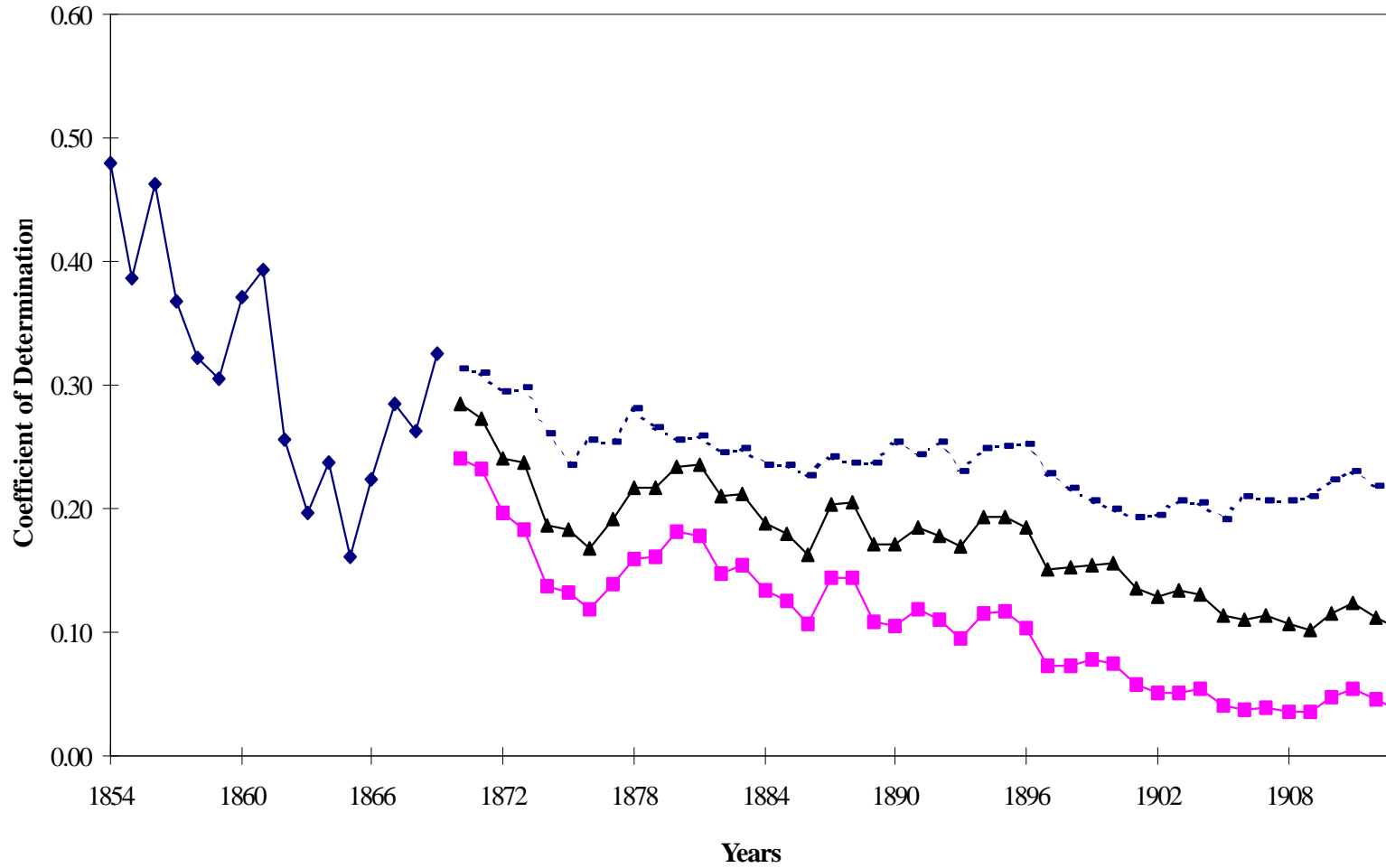
**Regional Real Wage Indices for Brazil, 1855-1935**  
**(SE: Southeast; NE: Northeast)**

Period	Average of (SE-NE)/NE ratio
1855-1859	2.81
1860-1864	1.55
1865-1869	1.33
1870-1874	1.79
1875-1879	2.50
1880-1884	3.23
1885-1889	4.27
1890-1894	3.91
1895-1899	3.63
1900-1904	2.65
1905-1909	2.12
1910-1914	2.19
1915-1919	2.59
1920-1924	2.90
1925-1929	3.62
1930-1935	5.81

Sources and Notes: The real wages series used for the calculations were PPP-adjusted. See Appendix Table 7.2.

Figure 1

International Real Wage Dispersion in the Atlantic Economy, 1854-1913



Source: Williamson (1995, Table A2.1; revised in O'Rourke and Williamson, 1997)

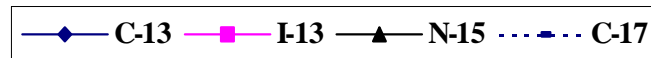
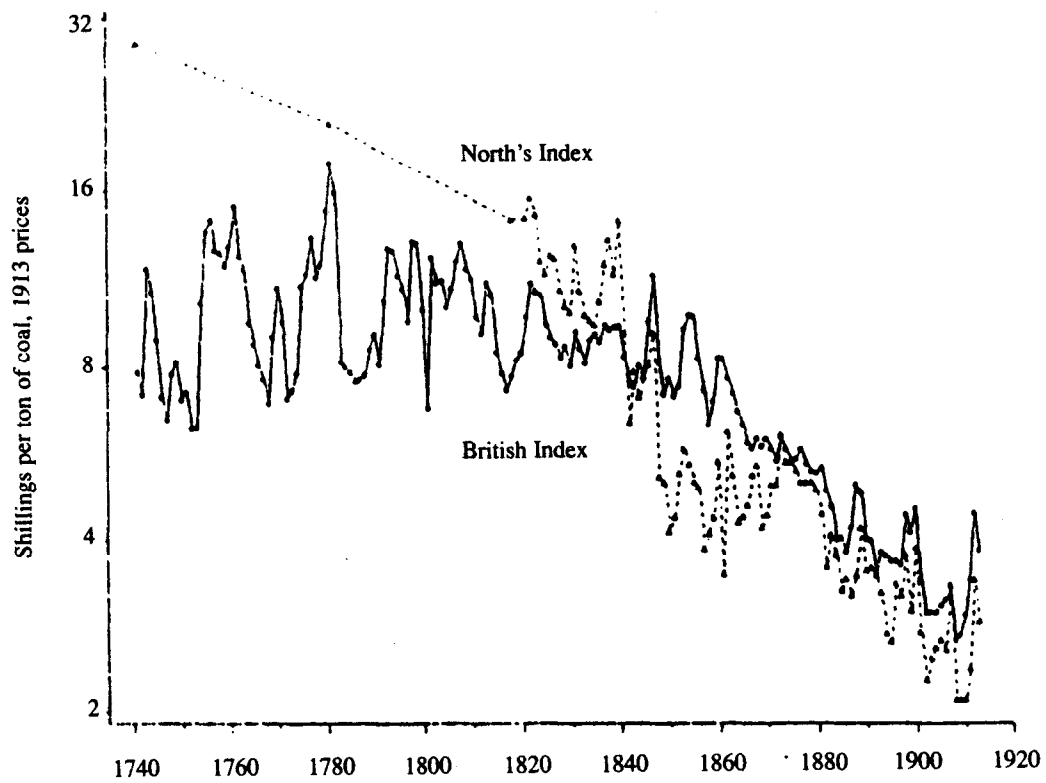


FIGURE 2

*Atlantic Economy Ocean Freight Rate Indices 1741-1913*



SOURCE: Harley (1988, Figure 1), deflated by UK GNP deflator, ratio scale.

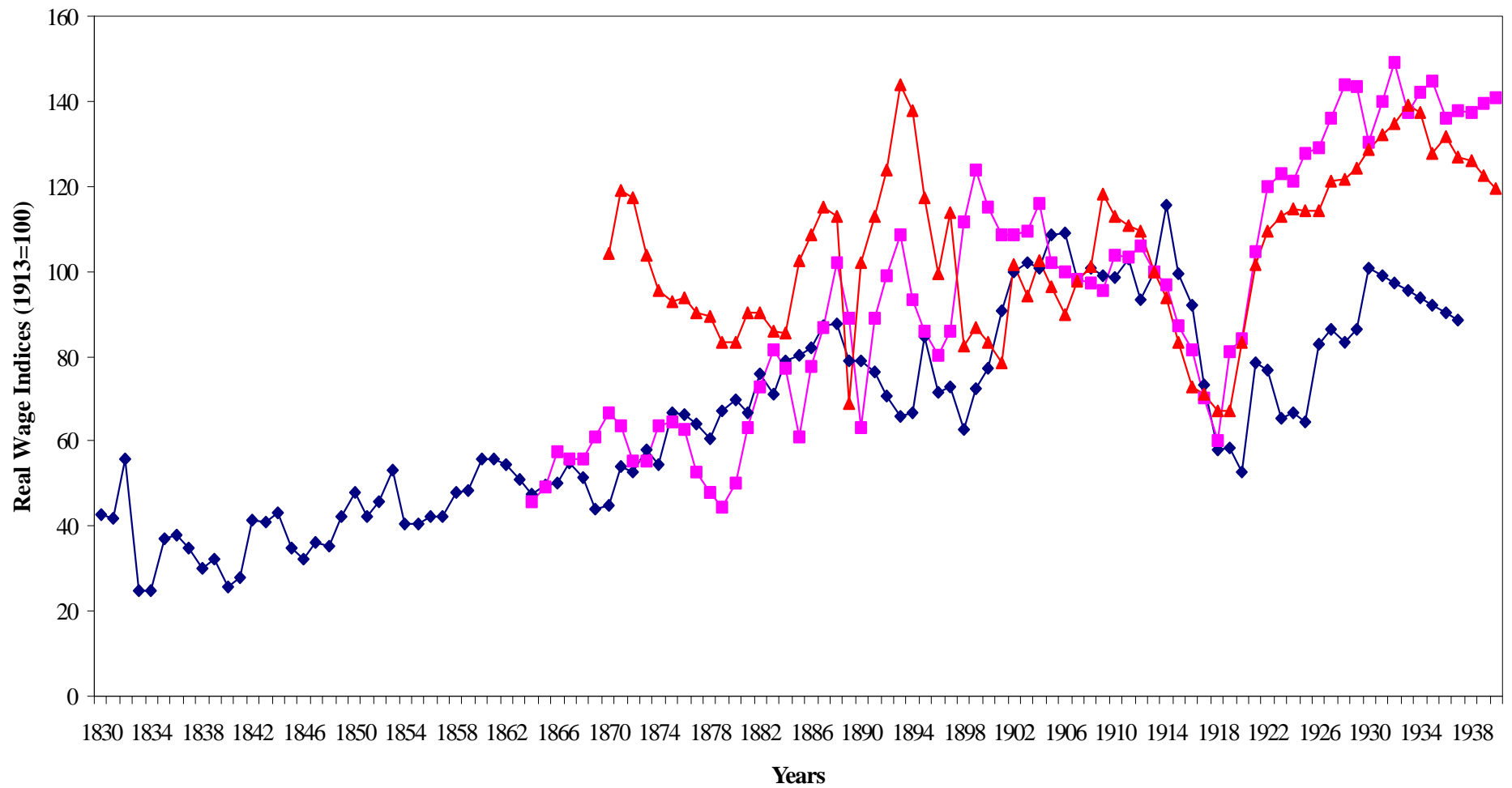
**Figure 3**

**Dispersion of GDP Per Capita in Latin America, 1900-1905**



Figure 4

Real Wages in Latin America (1913 = 100): Argentina, Southeast Brazil and Uruguay

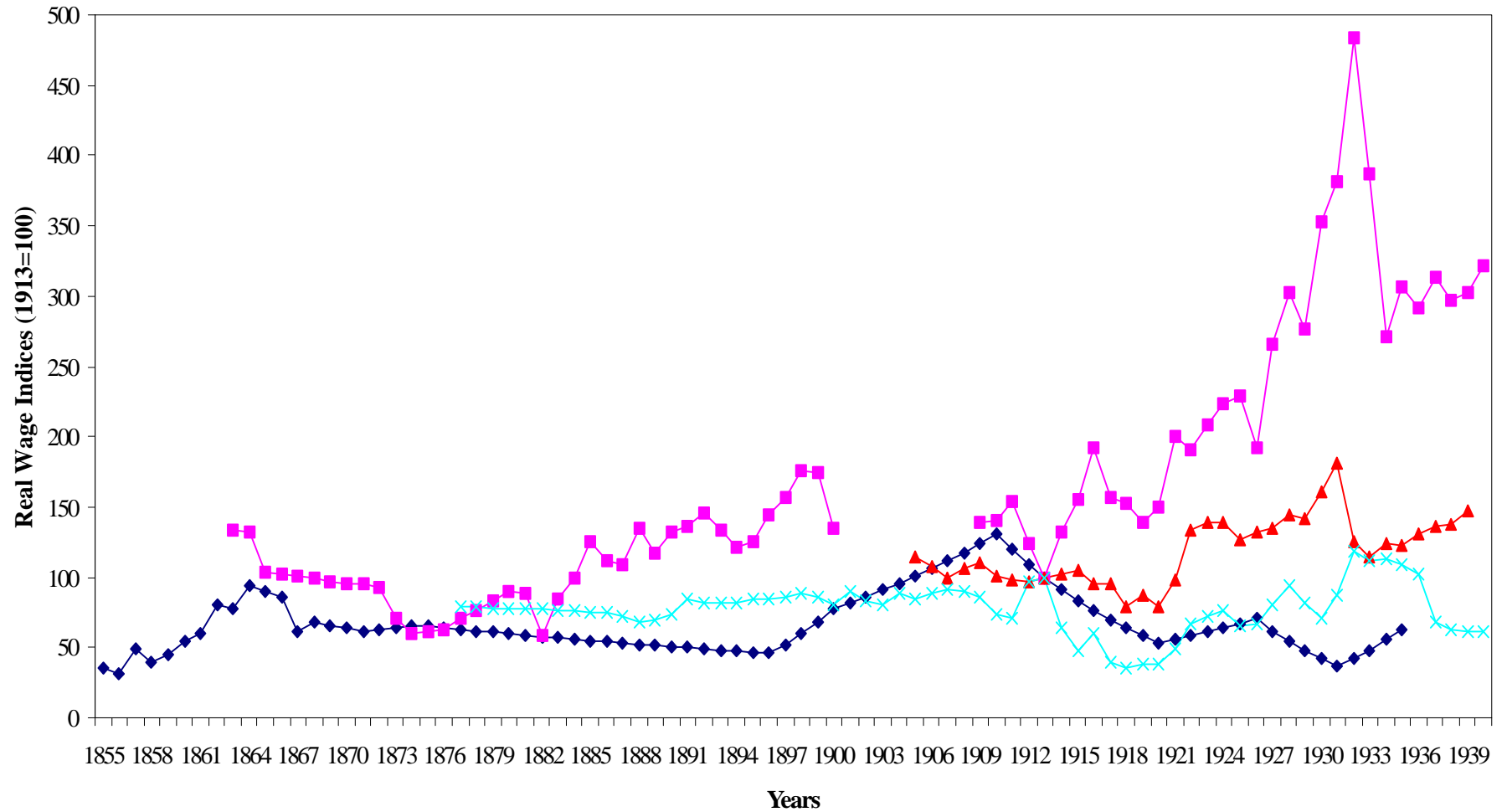


Sources: Appendix Tables 1.3, 2.3, and 6.3. Interpolated figures included.



Figure 5

Real Wages in Latin America (1913 = 100): Northeast Brazil, Colombia, Cuba and Uruguay

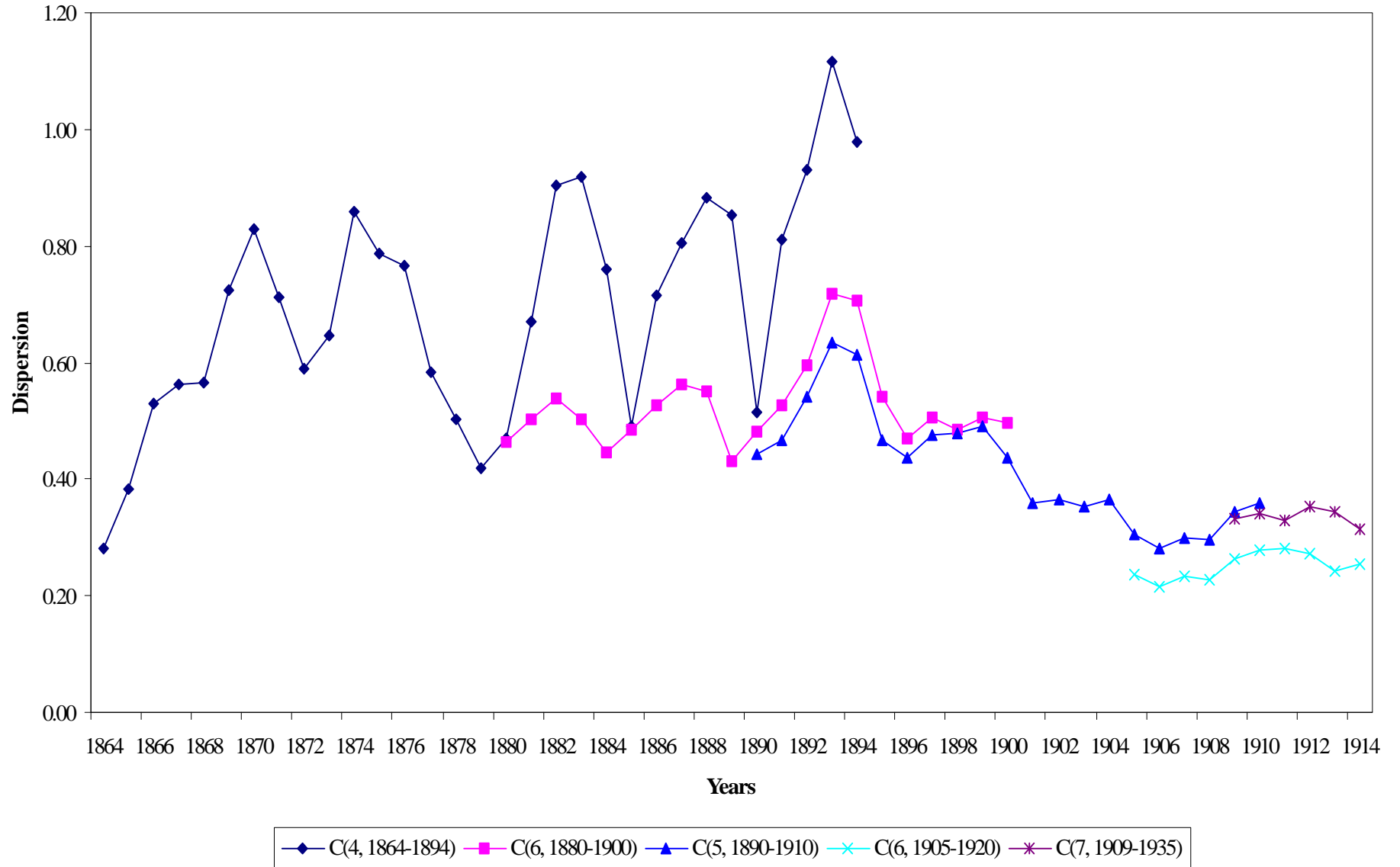


Sources: Appendix Tables 2.6, 3.3, 4.3 and 5.3. Interpolated figures included.



Figure 6

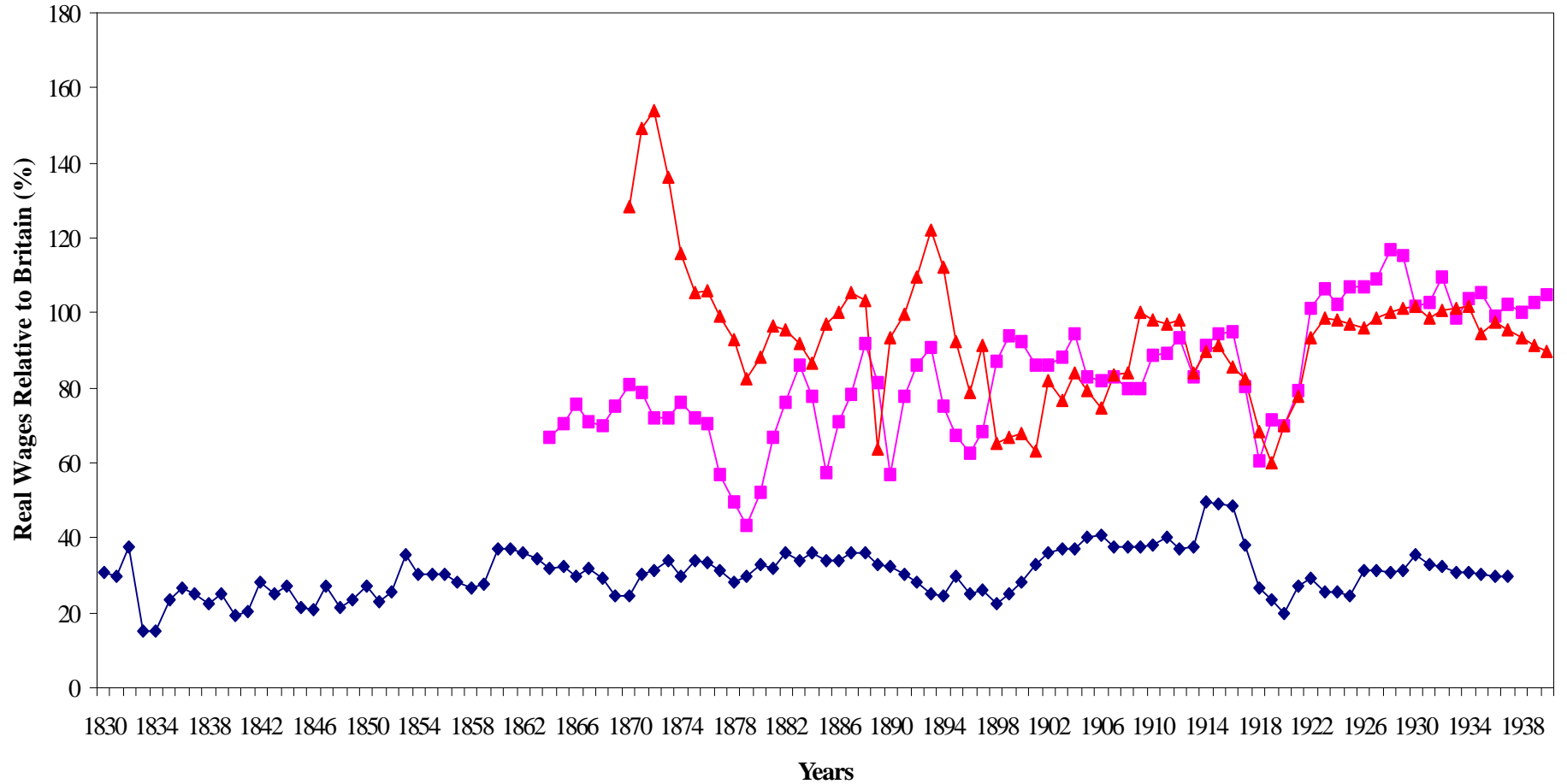
Dispersion of PPP-Adjusted Real Wages in Latin America, 1864-1914





**Figure 7**

**Real Wages in Latin America relative to Great Britain (in percent)  
Argentina, Southeast Brazil, and Uruguay**

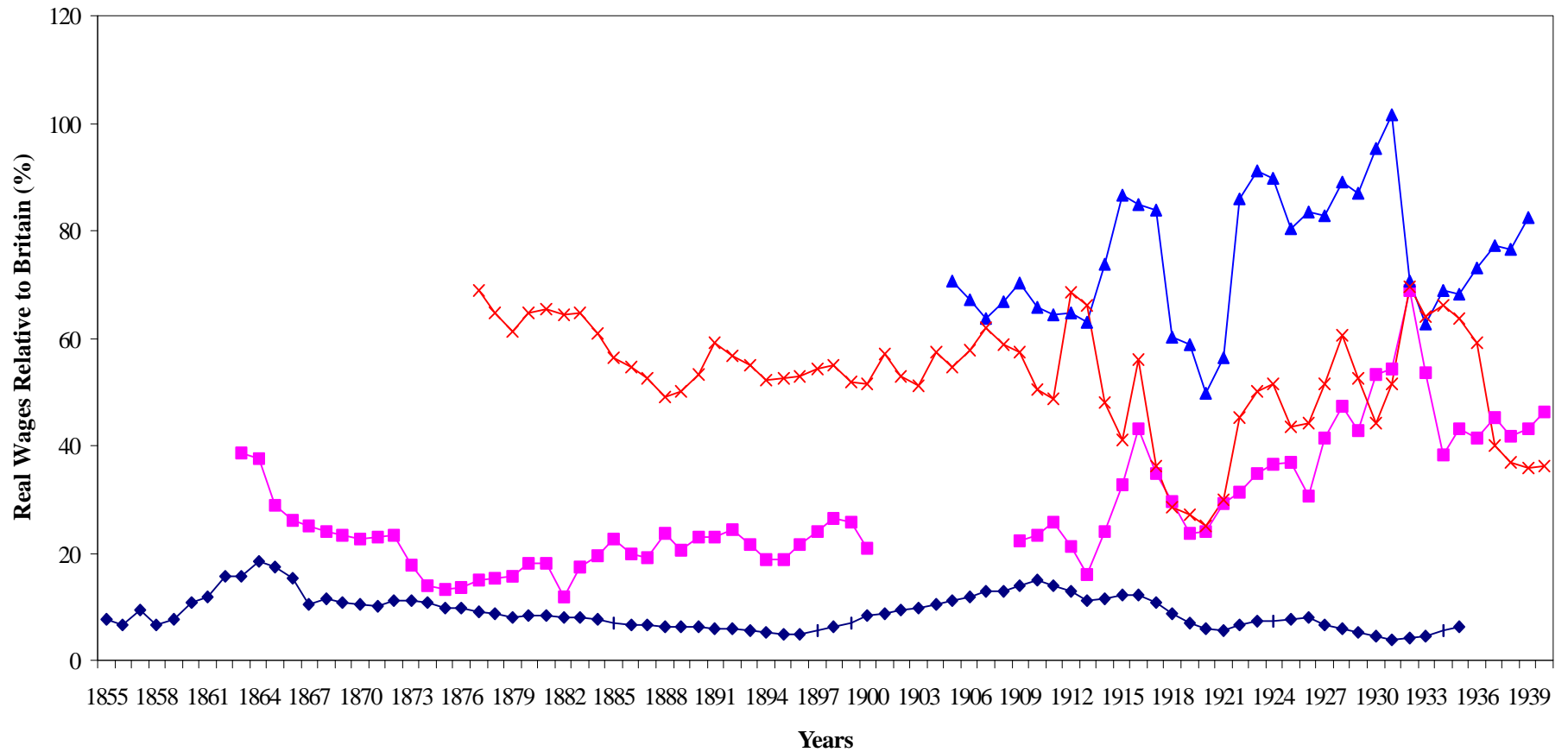


Sources: See table 1. Interpolated figures included.



Figure 8

Real Wages in Latin America relative to Great Britain (in percent)  
Northeast Brazil, Colombia, Cuba and Mexico

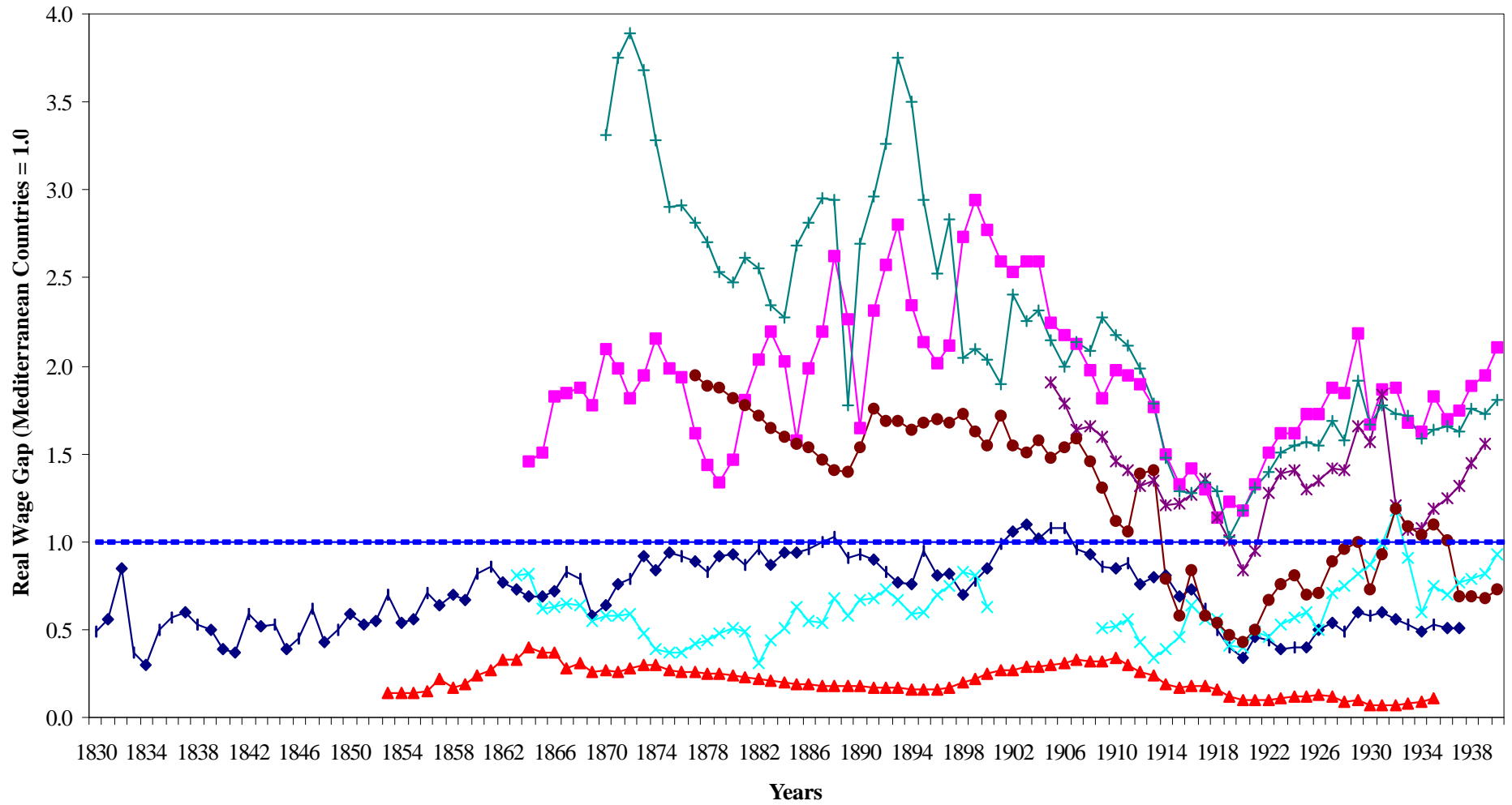


Sources: See table 1. Interpolated figures included.



Figure 9

Real Wage Gap Between Latin America and the Emigrating Mediterranean Countries



—◆— Brazil, Southeast —■— Argentina —▲— Brazil, Northeast —×— Colombia —\*— Cuba —●— Mexico —+— Uruguay —■— Mediterranean Countries

**Figure 10**

**The Long-Run Labor Supply Response:  
Correlation Between the Initial Real Wage and Subsequent Population Growth, 1870-1940**

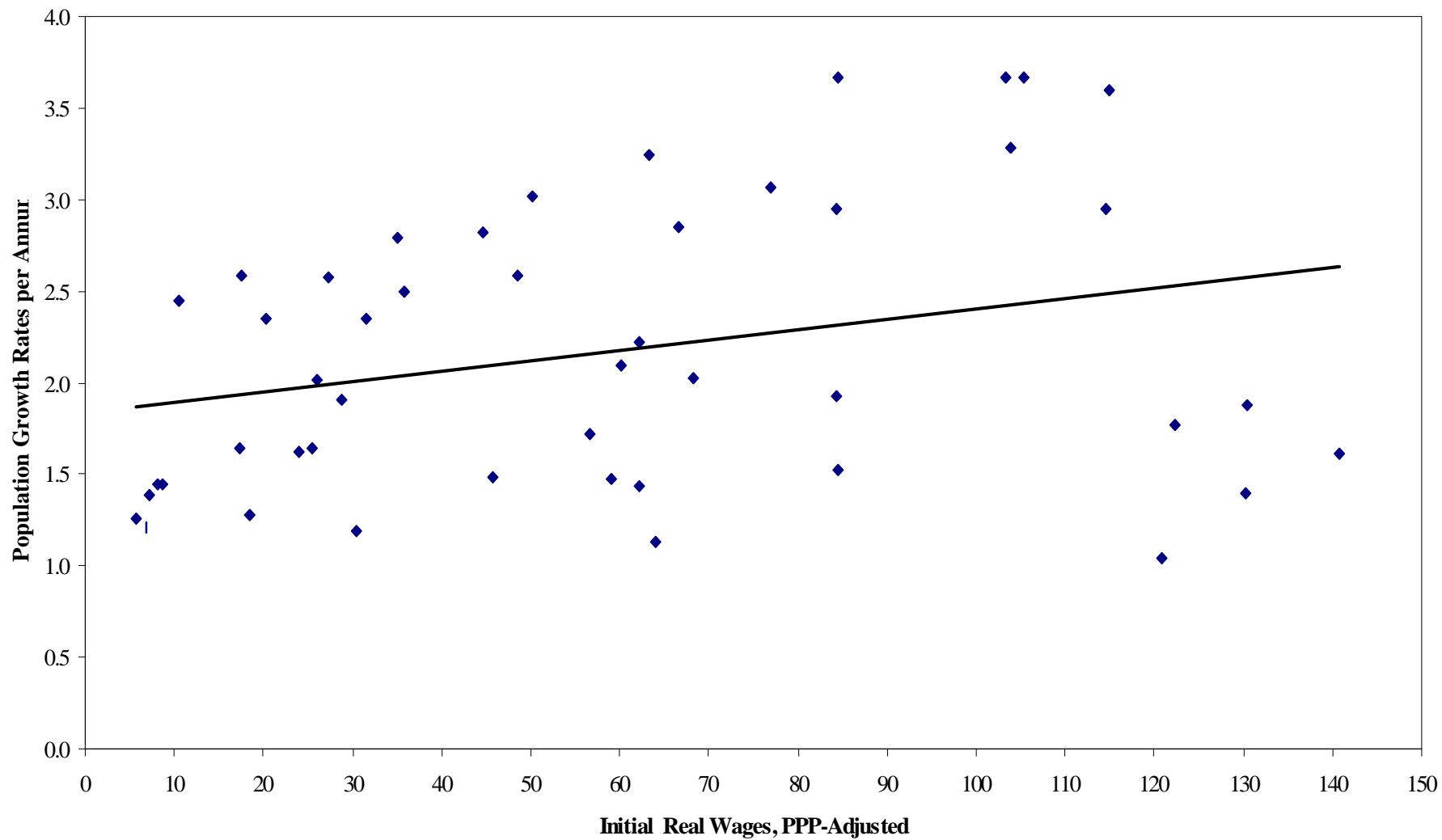


Figure 11

Trends in the Inequality Proxy (w/y) in Latin America: 1870-1940

