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THE IMPACT OF GLOBALIZATION ON PRE-INDUSTRIAL, TECHNOLOGICALLY QUIESCENT ECONOMIES: REAL WAGES, RELATIVE FACTOR PRICES, AND COMMODITY PRICE CONVERGENCE IN THE THIRD WORLD BEFORE 1940

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The Impact of Globalization on Pre-Industrial, Technologically Quiescent Economies: Real Wages, Relative Factor Prices and Commodity Price Convergence in the Third World Before 1940

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ABSTRACT

This paper uses a new pre-1940 Third World data base documenting real wages and relative factor prices to explore their determinants. There are three possibilities: external price shocks, factor endowment changes, and technological change. As the paper's title suggests, technological change is an unlikely explanation. The paper lays out an explicit econometric agenda for the future, although more casual empiricism suggests that external price shocks were doing most of the work, and declining-transport-cost-induced commodity price convergence in particular. Real wages in Asia, the Middle East, and Latin America never showed any signs of catching up with the European industrial leaders prior to 1914, but they did hold their own. The ratio of wages to land rents, on the other hand, declined up to World War I, and so did the ratio of wages to GDP per capita. The trend reversed thereafter. These relative factor price movements help sharpen our understanding of the sources of growth (or lack of it) in Asia and Latin America prior to 1940. They also offer strong hints about changes in income distribution there.

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New Data, Old Questions

Two important features of the world economy after 1950 also characterized the economy after 1850. First, there was rapid globalization during the previous century 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, 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 and before, the Atlantic economy was characterized by prohibitively high transport costs, mercantilist protection, modest levels of 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 technological advances which produced 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, 1998e). However, Robert Allen (1998) has shown that the divergence probably started in Europe long before the early 19th century, perhaps as early as the 16th

century.[1]

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, what happened in the Third World? Angus Maddison's (1995) GDP per capita estimates document a widening gap between Europe and Asia, although the gap with Latin America is more stable. But is it obvious that GDP per capita and real wage gaps should have behaved the same way? Maybe not, if relative factor prices behaved differently in the periphery than in the center, and if the price of wage goods behaved differently than GDP price deflators. So, what happened to relative factor prices generally, and to the relative cost of labor specifically, when Latin America and Asia responded to the challenge of both the European industrial revolution and the first great globalization boom? And what happened to them during de-globalization after 1914?

These are the questions that motivate this paper. 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

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[1] Allen's work is important since it challenges the conventional wisdom that the industrial revolution was the prime mover of the center-periphery gap.

(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 or Asian 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.

Globalization and the Third World: Breaking Down the Tyranny of Distance

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 the Asian periphery from the European core where, after all, the industrial revolution was unfolding. By the late 19th century, transport innovations had 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 did not completely liberate Asia from the tyranny of distance by 1914. Indeed, economists have shown that growth performance today is still associated with whether a country is landlocked, whether the length of its coastline is limited, and whether it is far removed from OECD centers like New York, Rotterdam or, in 1999 but not in 1899, Tokyo (Radelet, Sachs and Lee 1997; Gallup, Sachs and Mellinger 1998; Bloom and Sachs 1998). Yet, it was the change in economic distance between core and periphery which triggered economic change in late 19th century Asia, even though economic distance was still extensive and trade shares low long after 1940.

Transport cost declines from interior to port and from port to Europe ensured that Asian economies became more integrated into world markets. Price gaps between Britain and Asia were driven down by the completion of the Suez Canal (Fletcher 1958), by the switch from sail to steam, and by other productivity

advances on long distance sea lanes. The cotton price spread between Liverpool and Bombay fell from 57 percent in 1873 to 20 percent in 1913, and the jute price spread between London and Calcutta fell from 35 to 4 percent (Collins 1996: Table 4). The same events were taking place even farther East, involving Burma and Java. The freight rates on sugar between Java and Amsterdam fell by 50-60 percent between 1870 and World War I (Yasuba 1978: Graph 2). They fell by about 65 percent on rice shipments between Burma and Britain (Yasuba 1978: Graph 2). Indeed, the rice price spread between London and Rangoon fell from 93 to 26 percent in the four decades prior to 1913 (Collins 1996: Table 4). These events had a profound impact on the creation of an Asian market for wheat and rice, and, even more, on the creation of a truly global market for grains (Latham and Neal 1983; Brandt 1985, 1993; Kang and Cha 1996). These technological events had their impact on trade and transport costs within the region as well. The freight rate on coal (relative to its export price) between Nagasaki and Shanghai fell by 76 percent between 1880 and 1910, and it has been estimated that the total factor productivity growth rate on Japan's tramp freighter routes serving Asia advanced at 2.5 percent per annum in the thirty years between 1879 and 1909 (Yasuba 1978: Tables 1 and 5).

This commodity price convergence generated an Asian trade boom between 1870 and 1913, just as it did in the Atlantic economy. Export shares in GDP (constant price, Maddison 1995: 190 and 237) almost doubled in India (3 to 5.7 percent); they more than doubled in Indonesia (1 to 2.2 percent); and they more than tripled in Thailand (2.1 to 6.7 percent). But the greatest 19th century globalization shock in Asia did not involve transport revolutions at all. Under the persuasion of American gun ships, Japan switched from virtual autarky to free trade in 1858. It is hard to imagine a more dramatic switch from closed to open trade policy, even by the standards of the recent Asian Miracle. In the fifteen years following 1858, Japan's foreign trade rose 70 times, from nil to 7 percent of national income (Huber 1971). The prices of (labor-intensive) exportables soared in Japan, rising towards world market levels; the prices of (land and machine-intensive) importables slumped in Japan, falling towards world market levels. One researcher estimates that Japan's

terms of trade rose by a factor of 3.5 between 1858 and the early 1870s (Huber 1971); another thinks the rise was even bigger, a factor of 4.9 between 1857 and 1875 (Yasuba 1996: 548). Whichever estimate one accepts, this combination of declining transport costs and the dramatic switch to free trade unleashed exceptionally powerful globalization forces in Japan. Other Asian nations followed this liberal path, most forced to do so by colonial dominance or gunboat diplomacy. Thus, China signed a treaty in 1842 opening her ports to trade and adopting a 5 percent *ad valorem* tariff limit. Siam adopted a 3 percent tariff limit in 1855. Korea emerged from it's autarkic "Hermit Kingdom" about the same time, undergoing market integration with Japan long before colonial status became formalized in 1910 (Cha 1998). India went the way of British free trade in 1846, and Indonesia mimicked Dutch liberalism. In short, by the 1860s commodity price convergence was driven entirely by the sharply declining transport costs in Asia without much change in tariffs one way or the other. Asian commitment to globalization started (and stuck) more than a century ago, while Europe and its overseas offshoots began to show plenty of signs of globalization backlash before the interwar race to autarky (Williamson 1998e).

This account of Asia's emergence from economic isolation applies to Latin America as well. First of all, the economic distance to the European core varied considerably depending upon location in Latin America. The Panama Canal was not completed until 1914, and before then the Andean economies -- Peru and Ecuador -- were very seriously disadvantaged in European trade except for very high value and low bulk commodities produced along the coast, like guano. And prior to the introduction of a railroad network, 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 London 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, 25.6; and Bogata 52.9. The variance is huge, with the costs to Quito, Sucre, Chuquisca, Bogata,

and Mexico City nine to twenty-seven times that of Buenos Aires and Montevideo, the latter well placed on either side of the Rio de la Plata (Brading 1969: 243-4).

Geographic isolation helps explain much of the subsequent dismal 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 were still only about a tenth that of Australia, New Zealand and Canada in 1912 (Bulmer-Thomas 1994: Table 4.4, p. 107). Furthermore, and as I noted above, the tyranny of distance did not disappear as a development obstacle in these poor and initially-isolated parts of Latin America even after 1940 (Radelet, Sachs and Lee 1997; Gallup, Sachs and Mellinger 1998). Bolivia, Ecuador, Paraguay, Peru, the Argentine interior and the Mexican interior all faced and still face a trade disadvantage, and if trade matters to growth, those countries face a growth disadvantage as well.

In contrast, the Latin American countries 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. 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. Investment in river and harbor improvements increased briskly everywhere in the Atlantic economy, and the Panama Canal had a specific impact on Latin American trade. The switch from sail to steam was 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. Refrigeration was another technological innovation with major Latin American 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).

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 on trans-Atlantic commodity price gaps between Latin America and European markets? If they behaved anything like Anglo-American price differentials, they

must have produced powerful commodity price convergence. Liverpool wheat prices exceeded Chicago wheat prices by 58 percent in 1870, by 18 percent in 1895, and by 16 percent in 1912.[2] Moreover, these wheat price quotes understate the size of the price convergence because they ignore the collapse in price gaps between farm and interior railhead. 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 price convergence for meat and dairy products required those advances in refrigeration made towards the end of the century. Anglo-American price data are also available for many other non-agricultural commodities. The trans-Atlantic cotton textile price gap, which had been 14 percent in 1870, completely vanished by 1913; the 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 trans-Atlantic hides price gap fell from 28 to 9 percent, while the wool price gap fell from 59 to 28 percent.

What was the impact of these transport innovations on Latin American trade? While the estimates offered by Victor Bulmer-Thomas (1994: Table A.2.1, p. 439) may be rough, they show a huge increase: the share of Latin American exports in GDP rose from about 10 percent in 1850, to about 25 percent in 1912. When historians look at this period, they tend to focus on the trade boom, ignoring the fact that the world-wide decline in transport costs after mid century was enormous. 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 costs and that due to policy (such as tariffs). The price spread between markets is driven by changes in these costs, and they need not move in the same direction. Tariffs in the Atlantic economy did not fall from the 1870s to World War I; the globalization which

[2] The remainder of this paragraph draws its evidence from O'Rourke and Williamson (1994).

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 decline in transport costs created commodity price convergence in the world economy up to the Great War, and most of Asia, Latin America and the Middle East were a very big part of it. Indeed, the Third World may have been even more a part of it to the extent that tariffs were rarely raised there to mute the impact of globalization, in contrast with the European continent, North America and Australasia (Williamson 1998e).[3] Trade boomed. Pre-1940 Third World globalization forces are now on the agenda, just where W. Arthur Lewis (1969, 1978a, 1978b) insisted they should be. Note, however, that I have said nothing about that old chestnut, the North-South terms of trade. In contrast to that enormous literature (Diakosavvas and Scandizzo 1991), I have tried to emphasize that the transport cost declines influencing the trade connection between the Third World periphery and European core were so great that practically every country underwent an improvement in its terms of trade. It was not a zero-sum game. Prior to the Great War, the use of history to shed light on the North-South terms of trade debate is badly misplaced. The history after the Great War is another matter entirely.

Let us now explore the behavior of real wages and relative factor prices in the Third World periphery relative to the European core.

A Word About Measurement: Factor Prices Versus Output Aggregates

Most economists who have written about the comparative growth of nations have used GDP per

[3] There are obvious exceptions, like Japan's restrictions on rice imports after the turn of the century and tariffs in many parts of Latin America. I will deal with the Japanese exception below.

capita or per worker to measure catching up and convergence, or falling behind and divergence. There are at least four good reasons why it is a mistake for the convergence debate to used these output aggregates exclusively while ignoring wages and other factor prices. The arguments apply with special force to the pre-1940 Third World where industrialization and technological advance were mostly absent.

First, the pre-1940 real wage data for the Third World are of far better quality than the GDP data, and they are certainly available for a wider sample.[4] Indeed, while that vigorous pioneer Angus Maddison (1995) is able to document real GDP per capita for a surprisingly large part of early Asia, he still can only record observations for the following: Burma, the Philippines, Korea and Taiwan start only with the turn of this century and offer nothing for the previous one; Thailand starts with 1870, and repeats only every twenty years until 1913; Bangladesh and Pakistan start in 1820 but then leap over eighty years to 1900; China and Japan start in 1820 but then leap fifty years to 1870; and India and Indonesia start in 1820, leap to 1850 and then report observations only for every twenty years up to 1913. While impressive, such GDP per capita data are usually not enough to deal adequately with the questions raised in the introduction to this paper. Similarly, Maddison 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. Real wages in Latin America can be documented for the following (Williamson 1998c): 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 make statements about ppp-adjusted (purchasing-power-parity adjusted) real wages relative to the European core for both Asia and Latin

[4] The real wage data are purchasing-power-parity adjusted, they are typically daily or weekly, and they are typically for urban unskilled male workers. See any of my working papers on either Asia, Latin America or the Mediterranean (Williamson 1998a, 1998b, 1998c).

America. 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 usually 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 premiums or profits or rents, not that statistical artifact known as GDP per capita. By averaging all incomes, growth 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 a poor country is more likely to increase all factor prices equally than is mass emigration (easing population pressure on the land) or an export boom for agricultural products (increasing the demand for land). The open economy forces which are likely to have been most important in driving late 19th century economic change in Asia and Latin America -- trade and factor flows -- operated directly on factor prices, and thus only indirectly on GDP per capita. 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 and the survival of empires, perhaps more so in politically independent societies like Japan, Siam and post-revolutionary Latin America, than in dependent colonial societies like Indonesia and India. Still, changes that would increase GDP per capita but would also cause losses to some politically powerful group are often successfully resisted even in colonial economies, and examining the behavior of factor prices is a good way to start the search for the sources of such political resistance.

When Did the Core-Periphery Gap Open Up? Looking at Asia

When did the gap between core and periphery open up in Asia? Table 1 offers an answer by using my ppp-adjusted, urban, unskilled, daily or weekly real wages for males from eight countries in Asia, all

reported relative to Britain. The reader may think the comparison with Britain is unfair since the leader showed signs of failure in the late 19th century. It turns out that comparisons with the Netherlands make things a little worse for Asia, and comparisons with the average of Britain, France and Germany makes things a little better for Asia (Williamson 1998a: Table 4). But using alternative definitions of the European core does not change inferences about the evolution of the core-periphery gap.

Let us begin with the extreme version of the labor surplus model and 19th century real wage trends. The extreme version of W. Arthur Lewis's (1954) labor surplus model predicted a constant real wage, as did the classical model developed by British economists who had not appreciated when they were writing how the first industrial revolution was making a break with the past. Economists using 20th century data dealt the labor surplus model severe blows in the 1960s, and it is no longer the dominant paradigm that it was four decades ago. But might the model do better in pre-industrial 19th century Asia?[5] It does not. Prior to 1914, real wages in Asia underwent enormous short and long run variation, even when standardized by British performance. They collapsed by 42 percent in India between the early 1870s and the Great War. They more than doubled in Indonesia between the early 1820s and 1910-1914. In Siam, they surged, from the early 1820s to the early 1880s, then lost all of those gains by World War I. In Japan, real wages showed no long run trend at all until the 1880s, after which they started a steady climb which has persisted for a century. Furthermore, in the 1870s Asian real wages varied by a factor of five to one between the poorest we can document, Egypt, and the richest, Thailand. True, theory tells us that even in steady state countries can reach different equilibrium living standards (Barro and Sala-I-Matin 1995; Lucas 1998), but these differences seem much too big to be explained by culture and attitudes towards family size. In addition, and as we have seen, these real wage time series exhibit enormous variance, even when expressed as British relatives. Thus, real wages and workers' living standards were hardly constant. The real wage data offer no support for the view

[5] The odds are not good even here, given that the classical model cannot even explain British experience between 1780 and 1820, the period for which it was originally constructed (Williamson 1985).

that 19th century Asia was in steady state, or even that it was approaching steady state asymptotically. Instead, the region seems to have been frequently perturbed by big shocks that took a long time to dissipate.

Next, note that the real wage relatives for Japan and Indonesia imply that the core-periphery gap was no bigger in the 1920s and 1930s than it was a century earlier, about one-third and one-fifth of Britain. Thus, Asian living standards were way behind Britain when the tyranny of distance held sway, long before the first great globalization boom and even before the European industrial revolution really took hold in the first half of the 19th century. While it would be unwise to infer the behavior of the rest of Asia from that of Japan and Indonesia, their experience is not quite consistent with the revisionist findings of Kenneth Pomeranz (1997) and others who recently developed the case that early 18th century living standards in the lower Yangzi and Lingnan – China's two most advanced regions – were at least as high as they were in southern England and the Lowlands – Europe's two most advanced regions. Nor is the experience of Japan and Indonesia quite consistent with the revisionist findings of Prasannan Parthasarathi (1998) who has recently developed the case that living standards in south India were at least equal to that of England in the early 18th century. These revisionist findings on China and India invite the inference that the European industrial revolution must account for the gap between core and periphery. If that is so, why was there already a huge gap in the 1820s and 1830s? The 1820s may have been preceded by a half-century of industrial revolutionary events in Britain but every historian agrees that those decades between 1780 and 1820 recorded only the most modest real wage improvements in Britain (Lindert and Williamson 1983; Lindert 1994). There are only four ways to resolve this paradox: the Pomeranz and Parthasarathi data grossly overstate living standards in 18th century China and India; or the Williamson data grossly understate living standards in early 19th century Indonesia and Japan; or there were 18th century events that mattered to the evolution of British economy just as much as the industrial revolution; or Japan and Indonesia misrepresent the rest of Asia. On the latter, we do note that the gap between Thailand and Britain widened a lot between the beginning and the end of the 19th century, but all of that widening took place after the late 1880s. The paradox remains.

Consider now Burma, Indonesia and Thailand, the southeast frontier of Asia. The available time series for Burma is short, but what we do have suggests that living standards (relative to Britain) peaked twice, in the 1870s and the 1900s. Indonesia and Thailand peaked in between. The enormous rise in living standards in these parts of the southeast Asian frontier is consistent with globalization, rising export prices, and settlement on an extensive margin. The collapse after the 1870s and 1880s must be explained by other factors since the positive globalization forces were still at work until primary product prices collapsed after the Great War. Presumably, the extensive margin disappeared and continued immigration into the region began to press downwards the still-relatively-high-compared-to-emigrating-areas living standard. These are only speculations, and we may need different ones to explain the same trends in India. Real wages in India collapsed sharply between the late 1880s and the Great War (again, relative to Britain), and it was happening everywhere on the subcontinent (Williamson 1998a: Table 8). India seemed to share the same dismal post-1880s experience that was true of Southeast Asia.

Korean and Taiwanese experience seems at first sight to be consistent with the nationalist critique that Japanese imperialism eroded workers' living standards there (Kimura 1995; Kang and Cha 1996). Certainly living standards fell there after occupation. But correlation is not necessarily causation. How much of these trends can be attributed to Japanese imperial policy? If the answer is most of it, then exactly how did Japanese policy in Korea and Taiwan differ from US policy in the Philippines, and can the policy differences explain their strikingly different experience with the evolution of living standards? On the other hand, the decline in Korean and Taiwanese living standards might be explained by the collapse in primary product prices in world markets facing these relatively small economies that were heavily dependent on trade. If so, why weren't living standards sagging elsewhere in Asia from the turn of the century to the late 1920s, especially in the Philippines? We add these questions to a growing agenda, but some of them will be confronted again when we look below at relative factor price trends.

So, how did Asian living standard growth measure up with Britain? Japan's real wage was 33

percent of Britain in the early 1830s, and it was 32 percent of Britain in the late 1920s. No catching up here, but at least Japan was able to hold her own, first by switching in the 1850s from autarky to free trade, and second by mounting a very successful industrialization program after the 1880s. While the former didn't stick (the real wage gains up to the late 1850s and early 1860s disappeared by the 1870s), the latter certainly did. The other two success stories in 19th century Asia were brief. Indonesia and Thailand were actually catching up on Britain during their real wage surge from the 1820s to the 1880s, which was impressive since Britain was undergoing unusually fast real wage growth during that period. Table 1 documents that Egypt and Turkey also rose to a secular peak (relative to Britain) about the same time. With the exception of the Philippines, the rest of Asia was falling behind the European core. The core-periphery gap was already wide by the end of the first third of the 19th century, but it got even wider during the rest of the 19th century, especially after the 1880s. Finally, note that compared with Britain every Asian country had real wages in the late 1930s (1935-1939) equal to or a little greater than real wages just prior to World War I (1910-1914). Asia did a much better job holding its own with Britain during the quarter century after 1914 than during the quarter century before.

Asia's real wage performance over the century from the 1820s to the 1930s was impressive. No, there was no catching up on the European industrial leaders. Yes, Asia grew pretty much at the same rate. And Asia did it without any industrial revolution and under conditions of technological quiescence.

When Did the Core-Periphery Gap Open Up? Looking at Latin America

Table 2 documents that Argentina was catching up with Britain in the half-century before World War I. There is also some modest 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. 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.

Like Asia, Latin America did not exhibit much evidence of catch up on Europe's industrial leaders prior to 1914, but it did hold its own. In contrast with Asia, there is plenty of evidence of Latin American slowdown and fall back after 1914. Why the difference? Relative to the world leaders, better growth performance in Latin America prior to World War I than 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 it 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: bad luck in world commodity markets, bad luck in world factor markets, demography, the tyranny of distance and other forces. The examination of relative factor price performance might help sort these factors out.

Third World Trends in Wage-Rental Ratios Before 1940

The move to free trade in much of Asia, plus the revolutionary decline in transport costs everywhere in the Third World, steadily eroded price gaps between the European core and the periphery in the half-century before 1914. It probably eroded them even more within the periphery, since there was far less globalization backlash there. Prices of exportables boomed in the exporting countries. Price trends reversed after World War I, but on either side of that great divide one would have thought that the relative rewards to land and labor should have been dramatically affected. Exactly how they were affected should have depended, of course, on whether the abundant factor was land -- as in Argentina and the Punjab -- or labor -- as in Japan. Consider the canonical land-scarce and labor-abundant case, Japan. When Japan emerged from isolation after 1858, prices of its labor-intensive exportables soared, rising towards world market levels, while prices of its land and machine-intensive importables slumped, falling towards world market levels. The Heckscher-Ohlin model predicts that the abundant factor (labor) should have flourished while the scarce

factor (land) should have languished over the fifteen years or so following 1858. Did they?

The available factor price evidence for Japan in mid-century is limited. Table 3 confirms that data on land rents or land values are not available until 1885, long after Japan's leap to openness had taken place. But we do have some crude evidence, and it seems to confirm the Heckscher and Ohlin hypothesis. Maddison (1995: 182) estimates that real GDP per capita increased by only 17 percent between 1820 and 1870. Assume that all of that increase took place between 1850 and 1870, an unlikely event that argues against the thesis. J. Richard Huber (1971) estimates that the real wage for unskilled workers in Osaka and Tokyo increased by 67 percent in this period. True, this huge increase is much bigger than the real wage growth I have estimated; we would have to go all the back in my data to the late 1830s to find a real wage increase between then and 1870 (about 63 percent) anything like that estimated by Huber (Williamson 1998a: Appendix Table 5.3). Nevertheless, consider the implication of Huber's estimates: the wage of unskilled labor, the abundant factor, increased by 43 percent relative to average incomes in Japan. And under plausible assumptions,[6] this implies that land rents fell by more than 50 percent in Japan. Thus, the wage-rental ratio rose by more than 3.3 times (from 1.0 to 1.67/0.50). To repeat, this is exactly what one would have predicted when a technologically quiescent economy is hit with a huge price shock which favors the exportable and disfavors the importable: in a land-scarce economy like pre-industrial Japan, the wage-rental ratio should have soared, with obvious distributional (and, one supposes, political) implications.

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[6] The arithmetic is trivial. Let national income (Y) equal the sum of wages (wL, the wage per worker times the total labor force) and land rents (rD, rent per hectare times total hectares), and ignore skills, capital and all else: $Y = wL + rD$. Then per worker income growth is (where an "*" refers to the percentage growth over the full fifteen years):

$$Y^*-L^* = w^*\theta_L + L^*(\theta_L-1) + r^*\theta_D.$$

I assume that labor and land's share exhausted national income, and that labor got 60 percent. I also assume that land hectarage was fixed, and that labor force growth (assumed equal to population growth) was 7.6 percent between 1850 and 1870 (Maddison 1995: 106). If some of the GDP per capita growth between 1820 and 1870 actually took place before 1850, then land rents fell by even more than what I guess here. This calculation is taken from O'Rourke and Williamson (1998: Chp. 4).

These are only informed guesses, of course, but Table 3 reports the real thing. Wage-rental ratio trends can be constructed for Japan starting 1885, Korea starting 1909 and Taiwan starting 1904. In contrast with the Punjab after 1873 or Japan after 1858, the early 20th century was not a period of technological quiescence in East Asian agriculture. Instead, the region was undergoing land-saving and labor-using innovation (Hayami and Ruttan 1971), forces which should have served by themselves to raise the wage-rental ratio. It was also a period of dramatic industrialization, at least in Japan, which served to pull labor off the farms (Brandt 1993), another force serving to raise the wage-rental ratio. The period after 1910-1914 was also one of unfavorable farm price shocks (Kimura 1993; Kang and Cha 1996), yet another force serving to raise the wage-rental ratio. In short, we might expect those wage-rental ratio trends for Japan, initiated by globalization forces in the mid-19th century, to have continued everywhere in East Asia in the 20th century. That is exactly what Table 3 shows: East Asian wage-rental ratios surged up to the 1920s and 1930s. Indeed, land-scarce Europe experienced the same surge in wage-rental ratios during the so-called grain invasion after the 1870s, at least where trade policy remained liberal (O'Rourke, Taylor and Williamson 1996). Furthermore, the magnitudes were not so different. Between 1910/14 and 1925/29, the wage-rental ratio rose by 88 percent in Japan, by 46 percent in Korea, and by 40 percent in Taiwan (Table 3). The average increase in the wage-rental ratio for Britain, Ireland, Denmark and Sweden was 39 percent between 1890 and 1910, and 120 percent between 1870 and 1890 (O'Rourke, Taylor and Williamson 1996: Table 1). It might also be relevant to add that politically powerful landed interests were able to secure some protection from these globalization forces in both continental Europe with tariffs on grain (O'Rourke 1997; Williamson 1998e) and in Japan with import restrictions on rice (Brandt 1993).

In contrast with East Asia and Europe, I take the Punjab to have been relatively land abundant, an assumption that seems to be confirmed by the fact that agricultural exports from that Indian region to Europe

boomed after the 1860s and early 1870s.[7] Globalization should have had the opposite effect on the wage-rental ratio in land-abundant Punjab compared with land-scarce Japan: it should have fallen. And fall it did. Between 1873-79 and 1910-14, the wage-rental ratio in the Punjab fell by 61 percent. The Punjab's wage-rental ratio experience was not so different from that of the Latin American southern cone and other parts of the New World. From the late 1880s to World War I, the wage-rental ratio fell by 71 percent in the combined trio of Australia, Argentina and the United States (O'Rourke, Taylor and Williamson 1996: Table 2), and it fell by 79 percent in Argentina alone. Egypt, riding a cotton boom, conformed to these trends in Asia and Latin America: from the 1870s to 1915-1919, the wage-rental ratio fell by 56 percent, and from the late 1880s it fell by 87 percent (Table 3).

The factor-price-convergence theorem seems to have been alive and well in Asia, Latin America and the Middle East before 1940. So far, however, I have not said a word about changing resource endowments, labor supplies, and the Lewis model. The next section will do so.

Hints about Inequality Trends in the Third World Before 1940

Eli Heckscher and Bertil Ohlin (Flam and Flanders 1991) 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. As we have seen, limited historical evidence from the pre-1940 Third World seems to be consistent with Heckscher and Ohlin: the trade boom between the 1870s and the 1920s led to rising wage-rental ratios in relatively labor-abundant East Asia, and to falling wage-rental ratios in relatively land-abundant Argentina,

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[7]It is relative endowments that count for specialization and trade. Presumably, both labor and land had low productivity in the Punjab compared with Western Europe. The effective stocks of labor and land were both very low.

Egypt, the Punjab, and probably Siam and other parts of Southeast Asia.[8] As a consequence, conditions appear to have improved for the poor unskilled worker relative to the rich landlord in East Asia, while the opposite was probably true of Argentina, Egypt, Siam, Burma, and the Punjab. All of this borders on speculation, of course, since the globalization inference is guided by wage-rental ratio trends in a very small sample.

What about elastic labor supplies? In his famous model of the labor surplus economy, W. Arthur Lewis (1954) showed 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.

Lewis thought that his model of development with elastic labor supplies applied to late 19th century Latin America where European mass migration glutted labor markets and to tropical regions where Chinese and Indian contract labor did the same (Lewis 1978a), and many 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 labor supplies could account for stable wages in Sao Paulo and Santos from the 1880s onwards (see Table 2 and 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 has been 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

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[8] I do not have adequate wage-rental ratio data for Southeast Asia, a labor-scarce frontier. However, note in Table 1 that real wages (relative to Britain) were falling in Burma, Indonesia and Thailand after the 1870s, in most cases dramatically. Furthermore, using the data in Feeny (1982: Table 3-10) on land prices and in Williamson (1998a: Appendix Table 9.1) on nominal wages, we can say something about wage-rental trends in Thailand after 1915: they fell sharply, from an index of 100 to 76.

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 Leff, Lewis, and Diaz-Alejandro: Latin American development did not take place under uniquely elastic labor supplies.

Still, a rejection of the elastic labor supply hypothesis does not necessarily imply that rapid rates of labor force growth didn't matter. After all, a rise in labor-land ratios would keep wages from rising in economies where agriculture was dominant and industrialization only a promise for the distant future. The Lewis model is quiet about what happens to land rents under those circumstances, but the classical model from which it was derived certainly predicted a rise. Since the mass migration boom prior to World War I and the bust thereafter correlates so well with the bust then boom in the wage-rental ratio (Table 3), perhaps there is something to be said for changing endowments and labor supply.

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. The labor surplus model could also be used to predict stable real wages and falling wage-rental ratios in Southeast Asia, since the migration of surplus labor from India and China might have served to create an elastic labor supply in, for example, land-abundant Burma, Siam, and the Philippines.[9] It follows that globalization and the Lewis model both predict falling wage-rental ratios and rising inequality in Southeast Asia. They predict the opposite in labor-abundant East and South Asia. Since they make the same prediction, discriminating empirically between the competing Lewis and Heckscher-Ohlin views will prove difficult. Yet, if it can be shown that a good share of the variance in land-labor trends across the Third World prior to 1940 was driven by labor migration experience, then it can also be said that globalization events --

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[9]I assume, of course, that there is no comparable elastic supply of land on these frontiers. For this endogenous-land argument, see Myint (1958) and Findlay (1995: Chp. 5). Hla Myint's theoretical work was motivated by Burmese experience.

commodity price convergence and factor mobility -- account for much of the real wage performance, factor price convergence, and inequality experience there. The case in favor of commodity price convergence would be even stronger if it can be shown that factor mobility took place in response to the trade-creating price shocks.

Changes in relative factor prices can tell us a lot about changes in the distribution of income. This connection is especially useful since complete income distributions at various benchmarks between the mid-19th century and World War II are unavailable for any Third World country. But even if such data were available, it is not obvious that they would be 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 are far more important in pre-industrial agrarian nations, they need to be added to any Third World distribution inquiry. In any case, we have two kinds of evidence available to get hints about inequality trends in Asia and Latin America prior to 1940: trends in the wage-rental ratio, which we have already explored; and trends in the ratio of the unskilled wage to GDP per capita, which we have yet to explore. There is no reason to expect a perfect correlation between the two measures: after all, GDP includes returns to all factors, not just land. But since land was such an important asset in the pre-1940 Third World -- in contrast with human capital, I expect the correlation to be close.

Table 4 reports for Asia 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) 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 a rise in fertility or a fall in child mortality, and thus no increase in workers of adult age, **w/y** would (spuriously) rise as **y** fell. In contrast, if there was a sharp increase in population from the immigration of

adult labor, **w/y** would appear more stable. While this was not a period of dramatic demographic transition in Asia (Bloom and Williamson 1998), the immigration into Southeast Asia probably tends to make downward trends in **w/y** overstate rising inequality there. Suppose, in addition, that days or weeks worked per year increased due to seasonal smoothing and other forces that eroded underemployment? Then GDP per capita would rise, the daily or weekly wage would not, and thus **w/y** would fall. Some of the observed changes in **w/y** could also be driven by the performance of the price of wage goods (in the cost-of-living index underlying the real wage, dominated by the price of rice and other grains) relative to the GDP deflator (underlying the real GDP per capita estimates). But such relative price movements have clear distributional implications on the expenditure side, since the poor are more dependent on rice and other foodstuffs than are the rich (as a share of their budgets). These qualifications are likely to matter, but one can only hope that trends in **w/y** 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, especially if our primary goal is to explain differences in those trends across countries and between epochs. I am optimistic since the statistic is highly correlated with more comprehensive inequality measures in the few cases where both are available for the Atlantic economy prior to 1940 (Williamson 1998d: Table 5).

Table 4 shows that any successful explanation of changes in **w/y** in Asia between 1870 and 1940 will have to be complex: the Heckscher-Ohlin and Lewis models will not, by themselves, account for all the variety. Still, they seem able to account for much of it. Japan, India, Indonesia and Thailand document the longest time series, and each underwent a long sharp decline in **w/y** before flattening out or even rising after World War I. The turning point for Indonesia seems to be the late 1920s, but for the other three it is 1915-1919. The real wage lag behind GDP per capita in these four Asian countries during the first great globalization boom seems to offer evidence of some weaker version of the Lewis model, not constant wages but rather sluggish growth and modest trickling down. But why the common turning point for four economies with such different attributes? Since it seems unlikely that such dissimilar economies could share the same

Lewis turning point, perhaps a more likely explanation lies with world markets. These four countries were more likely to have shared similar globalization-induced price shocks which produced the same trends in **w/y**.

The Philippine and Burmese time series are much shorter, but what we have obeys the same Asian laws of motion that we have seen already for the other four countries. The Philippine turning point is 1910-1914, and it shares the steep decline up to that point and the sharp reversal thereafter. The experience of Taiwan and Korea is similar, with their turning points in 1915-1919, although the Korean time series is much too short to be very confident about long run turning points. As an aside, this evidence also does not offer much support for the nationalist critique of Japanese imperialist policies. If imperialism tended to exploit the ordinary native worker in occupied Korea and Taiwan, while favoring landlords in those two regions and Japanese consumers at home, why do we not see that redistribution in the form of falling **w/y** after the 1910-1919 decade? Why does the ratio rise instead? The answer may lie with world markets rather than imperial policy.

We have found an important Asian stylized fact. Real wages lagged behind GDP per capita growth everywhere in Asia up to the World War I decade. Real wages outstripped GDP per capita growth thereafter. Latin America shares the same stylized fact with Asia. Argentina, Mexico and Uruguay document the longest **w/y** time series, and they all underwent a long, steep decline in **w/y** before it flattened out or even rose after World War I (Table 5). The turning point for all three is 1915-1919, a result consistent with Argentina's wage-rental ratio trends. Although Cuba's time series is shorter, it 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 5 inconsistent with either the Heckscher-Ohlin or the Lewis model is Brazil, which underwent a steady decline in **w/y** from the turn of the century onwards in both the Northeast and the Southeast. 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 5.

An estimated non-linear regression predicts that **w/y** reached a minimum in 1918-1919. [10]

Why did the real wage lag behind GDP per capita in so much of the Third World during the first great globalization boom? Is this evidence of some weaker version of the Lewis model, not constant wages but rather wage lag? Is it evidence supporting the factor-price convergence theorem where factors are quality-adjusted? Is it both? The striking fact is that there is a common turning point shared by economies with such different attributes. Since it seems unlikely that such dissimilar economies in such different parts of the world could share the same Lewis labor supply turning point, perhaps a more likely explanation lies with world commodity markets. These countries were more likely to have shared similar globalization-induced price shocks which produced the same trends in **w/y**. Of course, these two forces might be considered complementary rather than competing hypotheses, especially if the labor supply changes were driven by across-border migration, making both globalization-induced. The next section considers other possible explanations.

Explicit Theory and an Econometric Agenda

Not too long ago, Kevin O'Rourke, Alan Taylor and myself discovered evidence of relative factor price convergence in the late 19th century Atlantic economy (O'Rourke, Taylor and Williamson 1996). This is a different fact than the absolute real wage convergence documented in Figure 1. Instead, it was relative factor price convergence as measured by the wage-rental ratio, where the rents refer to farm rents or farm land values, as was true of the estimates reported here for Argentina, Korea, Taiwan, Japan and the Punjab. The convergence was manifested mainly by the collapse of the wage-rental ratio in the land-abundant and labor-scarce New World, and by the surge of the ratio in the land-scarce and labor-abundant Old World. Relative

[10] The ratio **w/y** is regressed on time (estimated coefficient = -1.355, t-statistic = 3.955) and time-squared (estimated coefficient = +0.0004, t-statistic = 3.934), and the predicted minimum is 1918.8.

factor prices were, of course, never equalized, but a good share of the relative endowment scarcities on either side of the Atlantic Ocean were eroded by World War I. Furthermore, the rise in the wage-rental ratio was much greater in those parts of Europe that stuck with free trade -- Britain, Ireland and Scandinavia -- than in those parts of Europe that retreated behind tariff walls -- France, Germany and Spain. This fact seemed to offer a clear confirmation of the Heckscher-Ohlin factor price convergence theorem: that the export boom on both sides of the Atlantic could account for the convergence by causing the derived demand for the abundant and cheap factor to boom, that is, land and rents in the New World versus labor and wages in the Old World. When we turned to the econometrics, this plausible interpretation met with some empirical resistance and it had to be modified. Would the same be true of the wage-rental and wage-GDP per capita trends I have documented in this paper for the Third World?

As my frequent reference to the Lewis labor surplus model was meant to suggest, there are certainly other explanations of relative factor price trends that might compete with the Heckscher-Ohlin model.[11]

First, one might appeal to the discovery and exploitation of land and natural resources at the open frontiers in the post-1850 Third World. Classical theories of pre-industrial performance argued that population growth would cause the relative price of land to rise as long as land scarcity did not choke off that growth. Certainly Malthus saw it that way: demographic events pushed up man-land ratios, lowered real wages, raised land rents, and caused the wage-rental ratio to fall to a new long run equilibrium where zero population growth was reattained. David Ricardo and John Stuart Mill told similar, but more explicit, stories. This theoretical tradition of European pre-industrial pessimism was carried into the late 19th century by the writings of Alfred Marshall, and Henry George. It has also influenced late 20th century mathematical models of growth, debates over sustainable growth provoked in the 1970s by the Club of Rome, and concern about the deteriorating natural resource environment in the Third World. Indeed, it is implied by Lewis' (1954) famous paper on economic development with unlimited labor supplies.

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[11]The remainder of this section draws heavily on O'Rourke, Taylor and Williamson (1996: 505-9).

But since European emigrants moved to Cuba and the Southern Cone in massive numbers in the late 19th century, wage-rental ratios should have fallen there by much more than in Europe, a Mill-Ricardo argument that should help account for the opposing factor-price trends in these two parts of the world. Similarly, there was a huge migration from labor surplus parts of South and East Asia to labor scarce parts of Southeast Asia: Indian emigrants went in large numbers to Burma, Ceylon, and Malaya, while Chinese emigrants went in large numbers to Burma, Malaya, the Dutch East Indies, Siam, French Indo-China and the Philippines (Latham 1986: 11). But if factor migration was the only economic event taking place in Asia, why the similar trends in relative factor prices at various locations? Were land and natural resources in Southeast Asia exploited just as fast, or even faster, than the rate of immigration (Myint 1958; Findlay 1995)? Was land (relative to labor) in East Asia extended on the intensive margin (by double-cropping) just as fast as on the extensive margin (by settlement) in Southeast Asia?

In general, then, this paradigm places heavy emphasis on international factor reallocation and endogenous resource exploitation as the mechanisms by which a fundamental disequilibrium in history was partially resolved: capital and labor chased higher returns (and each other) by migrating from land-scarce to land-abundant regions. Of course, a world policy commitment to integrated factor markets is needed to give the paradigm a chance to explain reality -- unrestricted mass migration and capital flows. The language of this paradigm sounds very much like John Stuart Mill, who, in 1848, anticipated the factor-price convergence debate by stressing the contribution of factor migration while ignoring what I have stressed thus far, the impact of commodity price convergence.

Second, one could explore accumulation forces. Capital deepening should, after all, raise the wage-rental ratio. Industrialization and capital deepening usually go together, and to that extent capital-deepening cannot have played an important part in the Third World. After all, industrialization was not an important part of Latin American and Asian experience, at least up to 1914. Paraphrasing Lewis (1978a), the Third World had a choice between importing European industrialization or exporting primary products, and they

choose the latter prior to the Great War. Thus, accumulation and capital-deepening are unlikely to play a major role in accounting for the relative factor price trends observed for the Third World.

Third, one might appeal to economic forces associated with changes in technology. As we have seen, there was real wage and living standard improvement in Asia and Latin America up to 1914. True, there was very little evidence of catching up with the European industrial leaders, but there is abundant evidence that much of the Third World was at least holding its own. Industrial revolutions typically embody productivity growth which favors industry. Since industrial output makes little use of farmland, industrialization tends to be relatively land-saving, raising instead the relative demands for labor and capital. Such industrial revolutionary events should, therefore, tend to raise the wage-rental ratio. According to this prediction, more rapid industrialization in Japan compared with Siam (Feeny 1996; Yasuba and Dhiravegin 1985) should also have served to raise the wage-rental ratio by more in Japan than in Siam. Such events should have contributed to factor-price convergence within Asia. This prediction would be reinforced if productivity advance in pre-1940 East Asia was land-saving and labor-using, while the opposite was true in Southeast Asia, just as the induced-innovation hypothesis would suggest (Hayami and Ruttan 1971).

Fourth, what about relative output prices and the terms of trade? The Third World terms of trade must have been driven by two forces: first, there were the globalization forces which caused commodity prices to converge world wide and caused export prices to boom everywhere; and second, there were independent supply side forces driving the relative price of primary products world wide. The globalization forces were driven by the decline in transport costs world wide, declines that were probably greater in the periphery, where they were rarely muted by tariff increase, than the core, where they were often muted by tariff increases. On these grounds alone, the relative price of exportables probably increased by more in the periphery in response to globalization forces than in the core. Supply-side forces were dominated by unbalanced productivity advance favoring industry. This tended to lower the relative cost of quality-adjusted industrial goods world wide, and, thus, to raise the relative price of Third World primary products still

further. These two forces reinforced each other in the primary-product-producing periphery while they offset each other in the industrial core. Thus, the pre-1914 price shocks favoring exportables were bigger in the periphery than in the core. Both forces reversed around World War I: there was de-globalization with the move towards autarky; and there was an industrial productivity slowdown at the center.[12]

The theory just reviewed makes the empirical agenda clear. I am in the process of developing a pre-1940 Third World data base that includes the following: the relative price of exportables in the home market; land-labor ratios (where the numerator is adjusted for multiple cropping and irrigation); a Solow residual constructed as the log of output per worker minus a factor share times the log of the land-labor ratio (a proxy for productivity growth and a correlate with unbalanced productivity advance and aggregate factor saving); urbanization indices (a proxy for the independent influence of industrialization); and a time dummy to see whether the World War I turning point evaporates when I control for these other forces. The results should be informative, especially when they are compared with what W. Arthur Lewis suggested many decades ago.

[12] In the short run, there was also the influence of an excess supply of primary products at the periphery generated by the long boom from the 1890s to the end of the War.

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Table 1

Real Wage in Asia Relative to Britain 1830-1939
(in percent)

Period	Japan	Burma	India	Indonesia	Korea	Phillipines	Taiwan	Thailand	Egypt	Turkey
1820-1824				18				32		
1825-1829				18				32		
1830-1834	33			16				25		
1835-1839	26			17				29		
1840-1844	32			16				24		
1845-1849	35			16				23		
1850-1854	33			15				27		
1855-1859	38			20				30	8.5	12.3
1860-1864	41			24				35	8.5	12.2
1865-1869	31			22				39	8.5	12.4
1870-1874	32	22	36	26				42	8.0	12.5
1875-1879	25	21	26	22				34	9.9	16.9
1880-1884	24	14	30	26				36	11.4	21.5
1885-1889	22	13	27	27				30	13.9	23.4
1890-1894	18	13	21	23				23	15.9	23.3
1895-1899	20	15	18	22		18	21	12	13.3	20.8
1900-1904	22	20	18	19		27	19	14	15.6	20.9
1905-1909	24	18	15	18	35	26	18	11	9.9	19.1
1910-1914	28	13	15	19	23	28	16	16	13.8	21.5
1915-1919	35	12	17	20	25	46	19	20	11.0	21.3
1920-1924	31		18	14	31	55	22	16	12.4	20.3
1925-1929	32		18	16	26	39	21	14	14.1	19.3
1930-1934	33		28	20	22	40	22	22	12.4	18.4
1935-1939	32		25	19	25	39	19	20	10.1	17.9

Source: For Asia, Williamson (1998a: Table 3). For the Middle East, Williamson (1998b: Table 1, Appendix Table A1.3 Appendix Table A2.3; 1995: Appendix Table A1.1).

Table 2

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

Source: Williamson (1998c: Table 3).

Table 3

Wage/Rental Ratio Trends in the Third World 1873-1939

Period	Argentina	The Punjab	Japan	Korea	Taiwan	Egypt
1873-1879		2.5807				2.5075
1880-1884		1.9249				3.8373
1885-1889	4.8418	1.9874	0.9120			7.5873
1890-1894	4.3427	1.3411	0.7864			5.1706
1894-1899	3.7043	1.2157	1.0401			2.2925
1900-1904	3.4503	1.2549	1.0950		0.6805	2.1240
1905-1909	1.6100	1.1860	1.2586	0.8331	0.8507	0.9212
1910-1914	1.0001	1.0109	1.2253	0.9876	0.9645	1.2679
1915-1919	0.6379	1.1496	1.1953	0.8867	1.1106	1.1012
1950-1924	0.6324	0.9821	1.8926	1.7624	1.3985	1.7671
1925-1929	0.6072	0.7858	2.3062	1.6965	1.3467	1.5760
1930-1934	0.6951	0.4092	2.6160	1.5728	1.3057	1.5401
1935-1939	0.7089	0.3402	1.7082	1.7463	1.2342	1.2922

Sources and Notes: The base year is 1913 = 1.00. The Argentine figure for 1885-89 is actually 1883-89, and the Egyptian figure for 1873-79 is actually 1877-79. Williamson (1998a: Table 6; 1998b: Appendix Table A1.4; and 1998c: Table 7)

Table 4

Wage/GDP Per Capita Ratio Trends in Asia 1870-1939

Period	Japan	Burma	India	Indonesia	Korea	Phillipines	Taiwan	Thailand
1870-1874	1.4016		2.1486	1.5218				1.9264
1875-1879	1.2644		1.7803	1.5550				1.7828
1880-1884	1.2106		2.0345	1.5882				1.9002
1885-1889	1.1526		2.0515	1.6214				1.7687
1890-1894	0.8749		1.7892	1.6031				1.3852
1895-1899	1.0058		1.5953	1.5074				0.8261
1900-1904	0.9981	1.7407	1.4692	1.3885		1.2781	1.2883	0.8968
1905-1909	0.9794	1.6477	1.2094	1.1887		1.0525	1.1818	0.6968
1910-1914	1.0123	1.0404	1.0369	1.0221	1.0231	0.9811	0.9377	0.9116
1915-1919	0.8824	0.6210	0.9666	0.8276	0.8667	1.2483	0.7985	0.8963
1920-1924	0.9955		1.3259	0.7020	1.3046	1.8559	1.1512	1.0046
1925-1929	0.8927		1.4189	0.6964	1.0986	1.2785	1.0175	0.8913
1930-1934	0.9896		2.4310	1.0620	1.0060	1.4769	1.0943	1.5066
1935-1939	0.4103		2.2626	0.9750	0.9168	1.4729	0.8174	1.3449

Sources and Notes: The real GDP per capita data are taken from Maddison (1995). The wage/GDP per capita ratio is itself reported in Williamson (1998a: Table 7). The base year is 1913 = 1.00.

Table 5

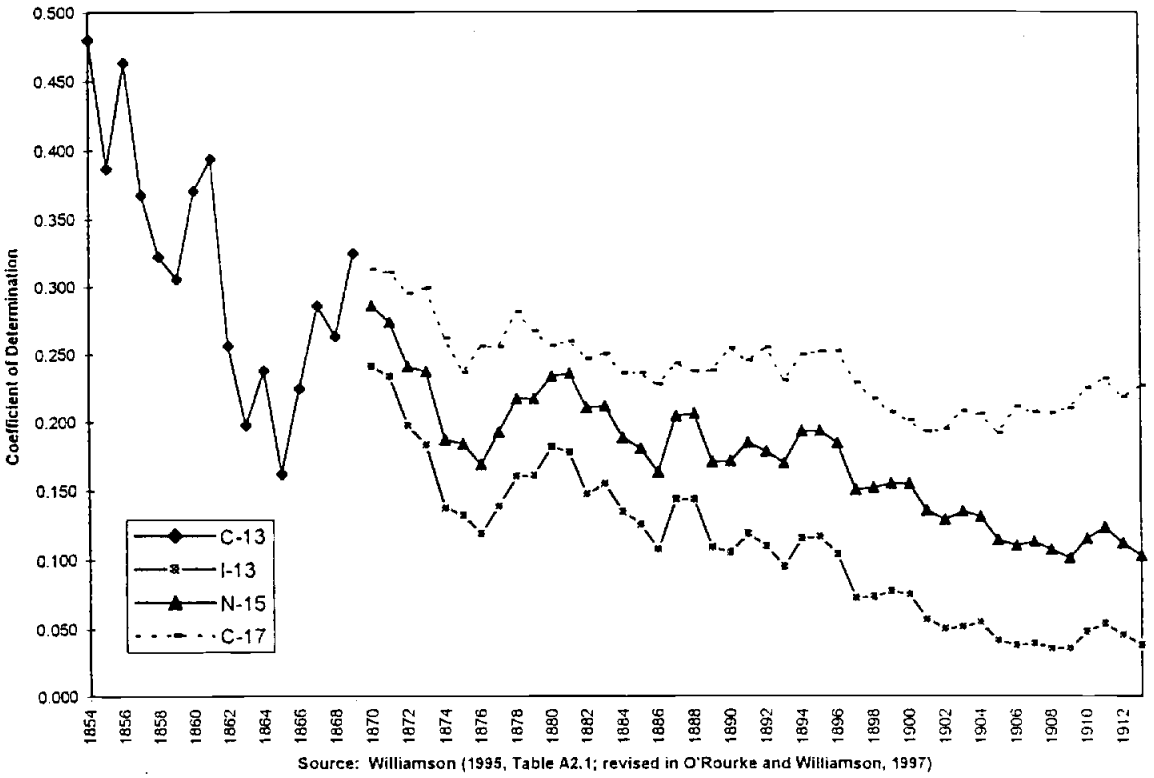
Wage/GDP Per Capita Ratio Trends in Latin America 1870-1939

Period	Argentina	Brazil Southeast	Brazil Northeast	Colombia	Cuba	Mexico	Uruguay
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					0.0503	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

Soures and Notes: 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). These GDP per capita figures were interpolated where necessary and rebased so that 1913 =1.00. The real wage data and the w/GDP per capita ratio are from Williamson (1998c: Table 8).

Figure 1

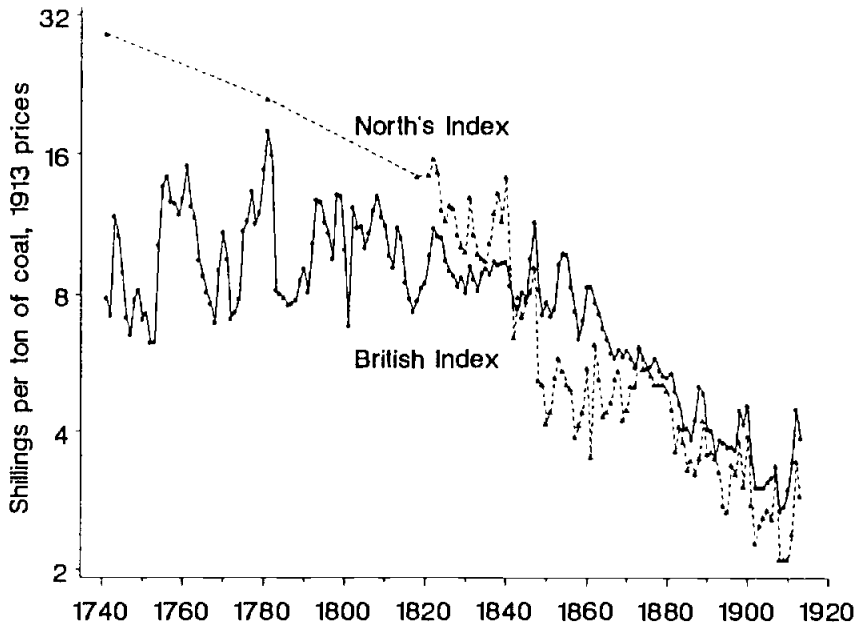
International Real Wage Dispersion in the Atlantic Economy 1854-1913



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.