PRELIMINARY AND INCOMPLETE

International Macroeconomics and Policy Notes on Globalization

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1 Introduction: Globalization and Convergence in Historical Context

In many ways the late Nineteenth and late Twentieth Centuries look a lot alike. In both periods commodity trade boomed and there were massive cross border flows of capital and labour (labour being particularly mobile in the late Nineteenth century). In both periods we saw, among what we now term the OECD countries, a massive rise in living standards in countries open to free trade, and indeed convergence (of a particular sort) in wealth. When we look at the historical record we see, then, an increase in globalization and convergence. The key question is: Are these developments causally related? A brilliant book by Kevin O'Rourke and Jeffrey Williamson (O&W, hereafter) (Globalization and History: The Evolution of a Nineteenth Century Atlantic Economy) answers decisively and, to my mind persuasively, in the affirmative. Their basic thesis is that the convergence that we saw amongst the key "Atlantic" economies (what we term the OECD area nowadays), between 1850 and 1917 was due to trade and mass migration.

1.1 Convergence: A brief Overview

So, is convergence a recent phenomenon? O&W look at average workers living standards in rich and poor countries (specifically they examine the PPP-adjusted real wage, amongst OECD economies). Their key findings are:

1.1.1 1830-1850 This was a period of industrial revolution in the UK, with this revolution spreading to other European economies. It was also a period of resource discovery in the New World (the Americas, basically) triggered by strongly declining transport costs. Up until the mid-Nineteenth century the data appear to indicate that real wage levels were diverging across the Atlantic economies. The mass migration that we were to see from the middle of that century on had not yet occurred, global capital markets did not really exist, and commodity trade was still relatively modest.

1.1.2 1850-1870 Free trade expanded rapidly (e.g., UK finally repealed the Corn Laws in 1846), as did mass migration and capital flows. Convergence amongst the core group of economies began (i.e., Brazil, France, UK, Ireland, The Netherlands, Spain, Sweden and the US), although some converged more rapidly and fully than others. Of course, looking from country to country the pattern is mixed. For example, between around 1850 and 1870 the Swedish real wage caught up with the UK real wage, but none of the other European economies did. In fact, France Norway and Spain actually lost some ground.

1.1.3 1870-1914 Here's how O&W describe this era.

> [This period]...involved the most extensive real wage and living standard convergence the Atlantic economy has ever seen, including the better known convergence of the post-World War II era.

See Fig. 2.2 in O&W. We see extensive real wage and living standard convergence. The 'Belle Epoque' of free trade, industrial catch-up and the Gold standard was in full swing.

Again, however, the aggregate data mask some differences in fortunes across countries. Here are two important facts:

- In this period, the average wage gap between Europe and the New World accounts for about 60% of the real wage variance, with the remaining 40% being explained by real wage dispersion within Europe.
- About 60% of the convergence that we see between 1870 and 1900 is explained by the collapse in the wage gap between Europe as a whole and the New World.

So the punchline, according to O&W, is that convergence is not so much a neoclassical growth theory story based on catch up with the UK, but more about labour abundant Europe catching up with labour scarce New World economies.

See Table 2.1 in O&W.

There was some intra-European convergence with, notably, the Scandinavian countries, especially Sweden, experiencing rapid real wage and per-capita GDP growth (real wage growth was 2.5 times that in the UK).

Overall, then, we saw falling wage-rental ratios in the New World and rising wage-rental ratios in Europe as grain flooded in from the US, the Argentine and Australia. Over this period some countries showed little tendency to catch up, notably Spain and Portugal.

Four countries illustrate best, according to O&W, the average wage gap that explains so much of the convergence between Europe and the New World.

- Ireland and Sweden; Both saw heavy emigration from around 1840 onwards;
- US: experienced heavy immigration from 1840 on; and
- UK: progressively lost its grip as industrial leader.

Some numbers to back up these points. In 1856 unskilled wages in Sweden were half that of the UK, but by 1913 they had risen to parity with UK. Over the same period Swedish wages rose from 24% of US wages to 58%. Similarly, in Ireland in 1852 (shortly after the famine) unskilled wages were 61% of UK wages, but by 1913 this figure had risen to 92%. The comparison with the US sees Irish wages 43% of US wages in 1855 and 53% in 1913. Of course, some countries buck this trend. For

example, Australia in 1854 enjoyed unskilled wages 148% above the UK level. That margin fell to just 31% above, by 1913.

2 The end of the first wave of convergence

North America's increasing world dominance after 1890 would have been enough to slow down the convergence statistics, according to O&W. Indeed, between 1914 and 1934 real wage dispersion did not fall further. And after 1934 real wage gaps widened, and some measures of dispersion retreated to levels not seen since 1870. Finally, O&W remark that

> "...divergence between 1935-1945 was so marked that all of the convergence gains up to the start of WWI were lost by the end of WWII".

3 A Closer Look at the Historical Record 1: Transport and Commodity Market Integration

As the Nineteenth century wore on, there was a dramatic increase in trade amongst the OECD economies, as Table A indicates. There are two possible reasons for this huge increase in commodity trade. First, the more liberal attitude to trade may have meant a lowering of tariff and non-tariff barriers to trade.

Table A

Trade Shares, 1870-1987 (merchandise exports as a% of GDP, 1985 prices)

Country	1870	1913	1950	1970	1987
UK	10.3	14.7	9.5	11.5	15.3
US	2.8	4.1	3.3	5.8	6.3
Total[a]	5.9	8.2	5.2	10.3	12.8

(a) Takes from O&W, Table 3.1, page 30. Original source for data can be found in the footnotes to the table.

Second, the Nineteenth century also witnessed a raft of inventions and innovations in transport that meant that transport costs fell dramatically. I am thinking specifically of inventions such as the steamship, canals and railroads.

3.1 Transport Costs

Prior to the railways merchants had basically two options vis a vis freight transport: water or road, with water being much cheaper than road (perhaps as much as 50-75% cheaper). And so between 1750 and 1820 British navigable waterways quadrupled (as did navigable European waterways). It is also worth noting that the US constructed the Erie Canal between 1817 and 1825. This canal reduced transport costs between Buffalo and New York City by 85%, and cut the journey time from 21 days to 8 days. Similarly, in 1817 it took 52 days to ship freight from Cincinnati to New York City

by wagon and riverboat. By 1852, journey time had shrank massively to only 6 days. That's what you call a positive productivity shock! With this collapse in transport time and costs, came a collapse in regional price differentials, from perhaps 100% to a mere 10%. The steamship was central to these developments (and there are many other examples of its joint impact along with canals, such as with the Suez canal which opened in 1869).

However, no less central to this transport revolution was the railway. Table B gives some data on railroad usage.

Table B

Railway Mileage[a]

Country	**1850**	**1870**	**1890**	**1910**
UK	6,621	15,537	20,073	23,387
US	9,021	52,9224	116,703	249,902

(a) Takes from O&W, Table 3.2, page 34. Original source for data can be found in the footnotes to the table.

In 1830 the Liverpool to Manchester line opened and railway usage mushroomed. So if canals, steamships and railways lead to a reduction of internal price differentials, they also did so between countries. And some new inventions helped. Between 1834 and 1861 mechanical refrigeration was developed and perfected. In 1876 the first refrigerated ship took beef from Argentina to France. By the 1880s European

agriculture was feeling the effects of this invention as South American and Australian meat was imported in large quantities, as was New Zealand butter. Figure 3.2 in O&W gives more details on transport costs.

The trend in transport costs seems clear. Now consider European trade policy.

3.2 European trade policy

Following 1815, and the end of the Napoleonic and Revolutionary wars, trade barriers started to come down in Europe. This was particularly marked in the UK which embraced the free trade doctrine perhaps more than the other European countries. The UK started systematically to dismantle many of its trade barriers funding this via income tax, destined now to be a permanent feature on the fiscal landscape.[1] The wars in Europe, particularly between 1792 and 1815 had been bad for trade, and had resulted in de facto "protection" for import-substituting domestic industries. As O&W put it, economic activity tended to shift from the Atlantic seaboard to the interior. European trade policy immediately after Waterloo was still protectionist. For example, the UK, although far from being the worst, still had the Corn Laws (1815). This meant that grain could be imported but could not leave the warehouses until the domestic price of grain had risen above 80 shillings per quarter. This, in effect, closed the grain market to foreign competition, and afforded UK landowners

[1] Income tax was introduced in 1799 by Pitt as a temporary measure to avoid excessive debt issue in the funding of wars. It was repealed and reintroduced a number of times in the ensuing decade.

a major amount of protection. Gradually in the UK the demand for trade liberalization gained political influence. There was an unwinding of some major anti-trade regulations:

- 1825: skilled workers were allowed to emigrate (something that had been prohibited since 1719);
- 1828: Corn Laws amended (introducing a sliding scale tariff, as domestic price rose, the tariff level fell);
- 1833: various tariffs reduced or removed (see O&W for details);
- 1845: various tariffs reduced or removed (see O&W for details);
- 1846: Corn Laws repealed.

The rest of Europe moved more slowly in the direction of free trade, but a major advance was secured in 1860 with the Cobden-Chevalier Treaty between France and the UK. This led to a major reduction in the barriers to free trade but most important was the establishment of the Most Favoured Nation (MFN) principle. MFN meant that any concession yielded by either France or the UK to a third country, was automatically extended to the other Cobden-Chevalier signatory. This led to a major opening of markets.

But even now there were anti-globalization straws in the wind. After the US Civil War (1861-1865), US tariffs started to rise to pay for the debts incurred. This tended

to damage the export oriented free-trade supporting south. Similarly, in Europe from around 1870 some countries began to complain about the influx of cheap grain from the US and Russia. This led to some tariffs on agricultural (and some manufactured) produce being introduced or increased.

See Table 6.1, p98-99.

However, despite this rise in tariffs after 1870, it appears that commodity price convergence continued suggesting that the fall in transport costs was more important than trade policy for commodity market integration. For example, in 1870 Liverpool wheat prices were 57.6% higher than Chicago wheat prices; in 1895 they were 17.8% higher; and in 1913 they were 15.6% higher. Similar convergence can be seen for other foodstuffs and textiles (and across other countries).

3.3 Trade during the industrial revolution [2]

Cotton goods exports rose continuously from 1780 until 1850 (an exception being the 1820s), the average rising from £25,000 in 1784-86 to £12 million in 1854-86. In terms of cotton's share in total exports, it rose from 6% in 1784-86 to a peak of 48% in 1834-36. After this period the volume of cotton exports continued to grow but there was a strong rise in metallurgical and engineering exports. In the first half on

[2] Much of the following section is based on Chapter 6, of Ronald Findlay and Kevin H. O'Rourke, Power and Plenty: Trade, war and the world economy in the second millennium, Princeton University Press2007.

the nineteenth century, Europe took most of the UK's exports (between 40%-60%, although Asia and Africa became increasingly important taking 39% of her exports in 1854-56 (compared to Europe's share of 29%).

The importance of UK cotton exports generally came to rely on the growth of cotton yarn exports (rather than cotton fabrics), as the US and continental Europe developed import substituting firms.

Britain's woollen goods generally rose over the first half in the nineteenth century, although they declined as a proportion of overall exports.

Exports of metals and metalware rose modestly up until the 1840s and then they surged, as a result of the railway boom; first to Europe and then in the 1850s to the US.

Britain's trade with the advanced economies of Europe reflected comparative advantage; Britain specialized in the mechanized spinning processes and the earlier stages of production with trading partners focussing on the less mechanized later stages of production. So, Britain's exports came to be dominated by semifinished, intermediate inputs in return for finished manufactures along with some primary products such as wheat, wine and timber. As regards the less developed regions, Britain continued to export finished manufactures in exchange for mainly primary foodstuffs including tea, coffee and sugar. During this time, Britain was also developing organized markets for raw cotton, wool and hides and reexport was also of some

importance.

Reexport trade in colonial produce constituted about one third of total exports for the first three-quarters of the eighteenth century. The loss of the North American colonies punched a whole in that. Wars with France were useful from this point of view; the North Americans began to use Britain for reexport although once peace was restored they traded once more directly with Europe.

However, in time as European industrialization got under way, Britain became a natural hub for reexport. Between 1794-96 and 1854-56 the share of reexports in total exports fell from 24% to 17%, but reexports rose in value from under £7 million to over £21 million.

Britain's total imports rose from about £20.3 million in 1784-86 to £151.8 million in 1854-86. The composition of imports changed dramatically from a proportionately large amount of manufactures in 1700 towards raw materials; the share of raw materials rose from 47% in 1784-86 to a peak of 68% in 1834-36.

The origins of the raw materials also changed dramatically with timber from Canada (instead of the Baltics) and wool from Australia becoming important. The share of raw materials from Europe fell form 65.7% in 1784-86 to 30.8% by 1854-56. However, Europe became somewhat more important as a source of manufactured goods with its share, over the same period, rising from 36% to 84%.

Cotton, sugar and tea were among the more important imports throughout this

period. Sugar was at the top for one hundred and fifty years but was replaced by cotton from about 1820 onwards.

Nicholas Crafts has estimated that exports accounted for 8.4% of British GDP in 1700 rising steadily to 19.6% in 1851. Other evidence points to the importance of exports for manufacturing; exports accounted for 13% of industrial output in 1700 rising to 49% in 1831. Hence openness and specialization appear to be important parts of the story for Britain. Furthermore, the large rise in population (from around 5 million in 1750 to roughly 10 million in 1800 (and just under 40 million in 1900)) and the dependence on food imports made it clearly in Britain's interests for the international trade system to work well.

Interestingly Britain's terms of trade (the relative price of exports) worsened steadily through the first half of the nineteenth century. Findlay and O'Rourke argue that this puts to death the argument that a big surge in demand helped kick start the industrial revolution; Britain's supply curve shifted out by more than the demand for Britain's exports. However, that does not mean that trade was irrelevant for the economic growth that occurred. Cotton was a crucial import and it had to be imported at whatever was the market price.

Of course, this is where the slave trade becomes significant. Some have argued, that the profits form the slave trade were of first order significance as it "financed" the industrial revolution (The "Williams" hypothesis). And it does seem from the

available data that profits were not inconsiderable. However, ultimately the industrial revolution is not about capital accumulation but technological progress and to that extent the Williams hypothesis is not well-focussed.

Findlay and O'Rourke argue that international trade was an important factor in the industrial revolution not petering out. Following a technological breakthrough, international trade means that the market is bigger, one is not limited to the domestic market only. Specifically, the large land mass associated with cotton growing in the US, worked by slave labour, meant that expansion could go ahead with, in effect, elastically-supplied factors (land and labour). Second, they argue technological change depends to some extent on the openness of the economy; larger markets means higher profits per innovation. If demand elasticities are relatively high, it means that an innovation that reduces price increases demand by a lot and thus profits (assuming costs of production don't rise too quickly). Trade also boosts technological advance because it helps transit ideas, something Robert Lucas has emphasized in recent contributions.

3.3.1 Why was Britain the first to transition to modern economic growth?

Compared with France, England had a land mass one quarter the size; its population was half that of France and its trade was twice that of France. Work by the French economic historian Francois Crouzet analyzed what contemporary French diplomats and officials said about England at this time. Repeatedly, it was emphasized that

Britain traded a great deal more than France, and they recognized that that was not unrelated to her considerable naval strength. It was even recognized that higher real wages in Britain had not hindered her competitiveness and that this was likely due to higher productivity. Unlike France, Britain did not specialize in luxury goods but tended to focus on mass markets. Finally, it was often argued that Britain secured advantage from a parliament focussed on business interests and pursuing small government. From this flowed a stable political system highlighting private property rights, freedom, liberty and religious tolerance.

What about a modern perspective—does it agree with these arguments? First, the Scientific Revolution and the New Enlightenment were not peculiarly British phenomena with many innovators all over Western Europe working and collaborating on various problems. Second, the idea that good institutions developed following the Glorious Revolution and secured a sound institutional framework within which investments and growth could flourish has been questioned. Recent work has found no link between the Glorious Revolution and subsequent total factor productivity or private interest rates. Similarly, it does not seem to be true that "small government" and low taxation were uniquely British. If anything, the British paid a lot of taxes to maintain its military might (especially naval might)—although clearly it seems reasonable to conjecture that this military might secured markets.

4 The Heckscher-Ohlin (H-O) Model in Historical Perspective

As we shall see in the next section of the course, the H-O model implies that price-convergence was likely to have had important distributional implications. H&O argued that commodity price convergence implied factor price convergence. If they were right then we should find that:

- The big winners would be New World land and European labour, while
- The big losers would be European land and New World labour.

It is not straightforward to test this hypothesis since many other things were going on during the late Nineteenth century. As O&W rightly point out the technological revolution was likely to imply rising real wages EVERYWHERE not just in Europe. O&W argue that there are four key questions:

1. Did European wages converge on the US wage?
2. Did land rents converge?
3. Did European rents fall and New World rents rise?
4. Was there relative factor price convergence?

1. There was, using PPP-adjusted real wages,convergence within the OECD group during this period, with much of it occurring between Europe and the US.

2. Land rents also converged in this period. For example, between 1870 and 1910 real land prices rose in Australia (over 400%) and also in the US (over 250%). Meanwhile, in the UK, France and Sweden, land prices fell (by 50% or more).

3. European land prices and rents did not always decline in absolute terms as H-O predicted; for example in Denmark they rose, while in Germany they were roughly constant. See the charts on pages 62 and 63 of O&W.

4. Relative factor price convergence does characterize the data between 1870 and 1913. In the New World we see plunging wage-rental ratios, while in Europe we see strongly rising wage-rental ratios.

The punchline is basically that H-O were about right. While the real wage grew everywhere, it grew fastest in labour abundant Europe compared with the labour scarce frontier, and rents surged in the land abundant New World and fell in the land scarce, free trading UK.

However, as noted, there were other important factors having effects. There was, of course, the effects of technical progress likely to be driving up factor returns quite independently of the effects of price convergence. In addition, there was mass migration: between 1820 and 1920 some 60 million Europeans settled in the new World.[3]

[3]By 1820 around 8 million black slaves had been taken to the Americas and Carribean; it was not until 1840 that free migration exceeded forced migration.

The story, in a nutshell, can be characterized as follows:

Trade → changes in commodity prices → affects agents' decisions → changes factor prices

So understanding factor price convergence is key. For example, as we noted above, Anglo-American commodity price gaps fell rapidly between 1870 and 1913. So what we saw in that case was:

↓ Transport costs → commodity market integration → factor price convergence

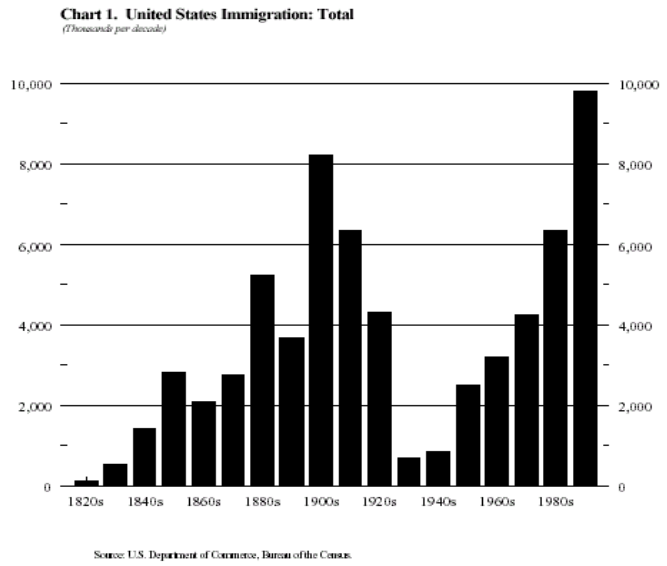
See the Data in Lucas (2001), Parente and Prescott and Lindert and Williamson.

Amongst the OECD economies we see dramatic unconditional convergence in the Post-WWII period. Nevertheless, the gap between rich and poor countries is wider than ever, even though some of these poor countries often exhibit conditional convergence.[4]

5 Migration

As noted, most of the migration was from labour abundant/poor Europe to the labour scarce New World, predominantly the US. As Mussa (2001) notes, in the United States the first restriction on inward migration was the Chinese Exclusion Act of 1882 (adopted because of domestic political opposition, especially in the Western

[4]Some of the key conditioning arguments are high population growth, low public savings rates, poor educational standards, openess, reputation, private property rights, democracy, etc,.

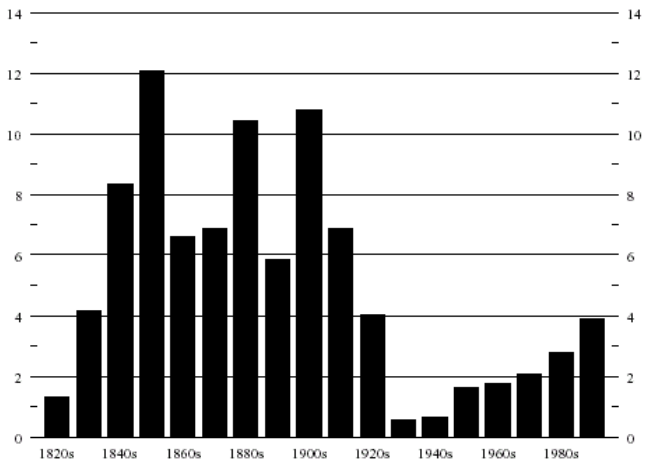


States (California) to further immigration of Chinese labourers primarily for railroad construction). More widespread restrictions did not come into force until the National Origins Act of 1924. As Heckscher and Ohlin would have predicted, labour in the New World would be a relative loser from open borders. The trends in US immigration can be seen in the chart from Mussa.

6 Globalization and Convergence: The Story So Far

Since World War II, real world GDP has risen at around a 4 percent annual rate, with real GDP in developing countries (*as a group*–there are important distributional issues we'll come to below) growing in per capita terms at about the same pace as the industrial countries. The result has been that real living standards have risen on average three-fold (see Table 1 of Mussa). There has been an equally dramatic

Chart 2. United States Immigration as a Percent of Resident Population



growth in world trade: goods and services trade has grown on the average at about 8% over the post-WWII period. So world trade in goods and services was one-tenth of world GDP in 1950 and is now around one-third of world GDP.

Poverty rates have declined markedly over the last twenty years (Xala-i-Martin, 2002, See also Parente and Prescott, 199X for a longer run perspective). Xala-i-Martin finds that the number of one-dollar a day poor declined by 235 million between 1976 and 1998. The number of $2/day poor declined by 450 million over the same period. However performance across regions has been far from uniform. Specifically he finds:

- Asia has undergone dramatic improvements, particularly after 1980.
- Latin America reduced poverty substantially in the 1970s but that effectively stopped in the 1980s and 1990s.

- Africa has been a disaster area with respect to poverty: Poverty rates have increased substantially over the last thirty years:
  - The number of \$1/day poor in Africa increased by 175 million between 1970 and 1998, and the number of \$2/day poor increased by 227 million.
  - 11% of the world's poor lived in Africa in 1960. By 1998 that proportion had risen to 66%.
- Overall, Xala-i-Martin argues, there has been a substantial reduction in global income inequality during the 1980s and 1990s.

Lindert and Williamson (2001) offer a nice analysis of these trends: They argue that the world economy has become more unequal over the last two centuries. That inequality is characterized by widening economic gaps *between* nations, but not necessarily *within* nations, as Sala-i-Martin shows. Lindert and Williamson find that increasing globalization has reduced the effects of inequality between nations that participate in global markets. The poorer nations that gained most from globalization were those that opened up their borders, and traded on the basis of their comparative advantage. Examining the data from 1820 on, Lindert and Williamson come, in particular, to five conclusions.

1. The dramatic widening of income gaps between nations probably has been reduced by globalization of commodity and factor markets, at least for countries

that integrated into the world economy.

2. Within labour-abundant countries before 1914, opening up to international trade and factor movements lowered inequality. This we can see from the earlier data which is cited in O'Rourke and Williamson.

3. Within labour-scarce countries prior to 1914 opening up to international trade and factor movements raised inequality, a powerful effect where immigration was massive. This effect led eventually to the US closing its borders to large immigration.

4. On the whole, more globalization has meant less world inequality.

5. World incomes would still be unequal even if the world was entirely integrated, but they would be less unequal in such an economy than they would be in one that is fully segmented.

7 Globalization, Relative Factor Price Convergence and Inequality

The Atlantic economy's history can be split into 3 periods:

1. The late Nineteenth century, 'belle epoque';

2. 1914-1950, 'the dark ages'; and

3. 1950→ 'renaissance'.

Periods 1 and 3 are periods of globalization, conditional convergence (poor countries catching up conditionally on rich ones), trade booms, large capital lows and substantial migration. Period 2 was a period of deglobalization and divergence, a slump in world trade and capital flows. A number of authors, O&W and Lindert and Williamson included, argue that globalization caused convergence. In short they argue that increased globalization increased inequality in the resource rich labour scarce New World while reducing inequality in the resource poor labour abundant Old World. In fact, these self same trends can also explain the backlash against globalization towards the end of the Nineteenth and Twentieth centuries. For example, in the US labour was disadvantaged by the huge amount of immigration. This lead directly to immigration quotas. Similarly the grain inflows from the US and Ukraine into Europe led to tariffs on these imports.

7.1 Further observations on income, output and growth in the world today

Although a subset of countries may have converged, or be converging, there remain very large differences in income and output per capita across workers in countries today. Countries at the top end of the world income distribution are more than 30 times richer than those at the bottom. Individuals in those economies consume on average 30 times more and enjoy better education and health. In 2000 PPP-adjusted

US dollars per capita GDP was $34,000 in the US compared with $8,000 in Mexico and $4,000 in China. For India the number is $2,500, whilst countries in Sub-Saharan Africa are much lower even than this.

From 1960 the modal world income per capita has increased from $1,250 (with most countries having income per capita of less than $1,500) to only $3,000. Again, everything is being measured in 2000, PPP-adjusted US dollar terms. However, although the mode hardly really changed, a new concentration of very wealthy countries emerged on the right tail of the distribution—these countries had incomes per capita in the region of $20,000 to $30,000. So, there is much greater inequality today than in 1960.

There is another way to try to gauge world inequality and that is by looking at the distribution of individual incomes across countries. One way—not the only way—is to weight national distributions by population size. As a result, countries like China, US, Russia and India receive a greater weight because of their larger populations. This changes somewhat our view of things; the distribution appears less spread out and, in particular, the left tail is thinner because India and China have grown relatively quickly since 1960 moving lots of individuals rightward in the distribution (although these individuals are by no means rich by our standards).

Xavier Sala-i-Martin (2003) measured the world distribution by adding up (integrating) individual countries' data on income distribution from 1970 until 2000. He

argues that the world income distribution has shifted to the right. That reflects, he argues, the fact that most countries have been growing—many at a reasonably constant rate. Income inequality has risen in some countries (such as China). However, overall aggregate growth has dominated the data so that the number of people living below the poverty line has decreased. Some have contested his interpretation of the data. However, the implication that growth has reduced poverty seems rather persuasive.

It is important to emphasize, however, that this is not inevitable; there is nothing to say that high growth cannot be accompanied by a rising proportion of the population falling below some poverty line. Just that pattern was observed in South Africa where the real wages of the black majority probably fell over the twentieth century. Economic historians argue that the living standards of workers fell during the early phases of the Industrial Revolution. So, all this data covering long periods of time is very useful for understanding where we are, but not necessarily how we got here.

7.2 Why do some countries succeed and others fail to achieve sustained growth?

So, overall there is great inequality in income per capita (and income per worker). In addition, there has been a slight but noticeable increase in inequality across nations (although not necessarily across individuals in the world economy).

Simple calculations suggest clearly that a small difference in growth rates between two countries that start out with similar income levels will result down the line in enormous income per capita differences. So, is growth the whole story? It turns out that the relative ranking of countries' per capita GDP has changed surprisingly little over the post-WWII era. Although there are very stark differences in post-war growth rates, the world income distribution has been relatively stable (with a slight tendency to become more unequal).

So, when did the divergence begin? Daron Acemoglu in his text on growth theory and his various research papers has drawn on ideas from historians and other social scientists to argue that the divergence begins to emerge during the nineteenth and early twentieth centuries.

The historical record, although far from complete or completely reliable, strongly suggests that West Europe and Western offshoots (Canada, US, Australia and New Zealand) experienced quite rapid growth during the nineteenth century. Asia and Africa, on the other hand, remained stagnant and Latin America showed little growth. The relatively narrow per capita income gap in 1820 had become large by 1960. The implication is that the origins of the vast differences we see today in income across countries lie in the pattern of economic take-off during the nineteenth century.

As far as economic historians like Maddison can tell, the per capita income gap before 1820 was even narrower than in 1820. In other words, the big divergence

between countries only happened in the last 200 years. Before then, income per capita was stable and periods of economic growth were the exception rather than the rule.

7.3 Convergence and the fundamental causes of growth

In 1961, Nicolas Kaldor stated six now famous "stylized" facts. He used them to summarize what economists had learned from their analysis of 20th-century growth and also to frame the research agenda going forward (Kaldor, 1961):

1. Labor productivity has grown at a sustained rate.
2. Capital per worker has also grown at a sustained rate.
3. The real interest rate or return on capital has been stable.
4. The ratio of capital to output has also been stable.
5. Capital and labor have captured stable shares of national income.
6. Among the fast growing countries of the world, there is an appreciable variation in the rate of growth "of the order of 2–5 percent."

Now, here is a summary of a new list of stylized facts, suggested by Charles Jones and Paul Romer in a recent thought-provoking paper (NBER Working Paper 15094, 2009):

1. Increases in the extent of the market. Increased flows of goods, ideas, finance, and people — via globalization as well as urbanization — have increased the extent

of the market for all workers and consumers.

2. Accelerating growth. For thousands of years, growth in both population and per capita GDP has accelerated, rising from virtually zero to the relatively rapid rates observed in the last century.

3. Variation in modern growth rates. The variation in the rate of growth of per-capita GDP increases with the distance from the technology frontier.

4. Large income and TFP differences. Differences in measured inputs explain less than half of the enormous cross country differences in per capita GDP.

5. Increases in human capital per worker. Human capital per worker is rising dramatically throughout the world.

6. Long-run stability of relative wages. The rising quantity of human capital relative to unskilled labor has not been matched by a sustained decline in its relative price.

Are countries converging in terms of per capita income? The answer seems basically to be: No. There is no evidence, when looking at the world as a whole, that there is an income level (or range) to which most countries in the world are converging. There is evidence that countries with similar characteristics (e.g., the OECD economies) are experiencing convergence; this is known as "conditional convergence" although such convergence tends to be quite slow; it may take up to 35 years to close half the initial difference in per capita income levels. So, what policies and institutions

make countries "similar" from an income per capita/growth perspective? Economists often emphasize factors like investment in physical and human capital (i.e., education). Countries with higher investment tend to grow more quickly. Another crucial factor is the ease with which countries develop and adopt new technologies. But, what causes countries to invest and adopt and develop new technologies? If human welfare is so vastly higher in the US than Nigeria, why does Nigeria not just simply invest more, build more schools and adopt newer technologies? Ultimately, we need to look institutions (e.g., democratic constitutions, respect for rule of law) and policies (e.g., free trade policies, tax) that may affect incentives to invest and improve technology.

8 Capital Flows and Globalization

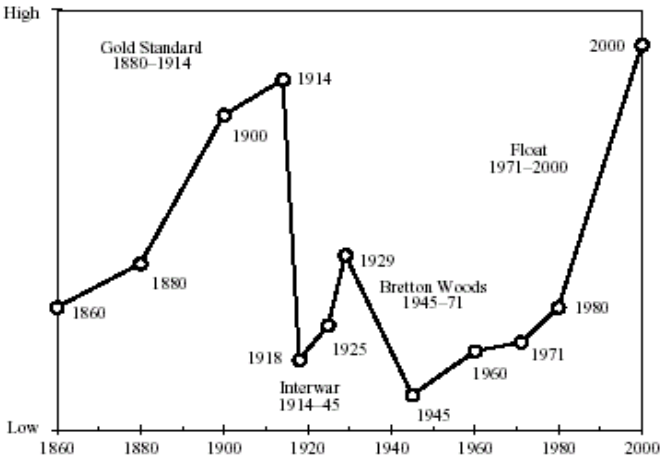
So far I have not mentioned capital markets. It is now time to do so. As Obstfeld and Taylor (2002) note, "The resurgence of concerns over international financial integration is understandable in light of the financial crises in Latin America in 1994–95, East Asia and Russia in 1997–98, and Argentina in 2001–02." It goes without saying that the events of 2008-09 have heightened those concerns still further. However, the concerns surrounding capital markets are not new, and can be traced back to the emergence of world capital markets through the mid- to late-Nineteenth century. Just as technological factors revolutionized commodity trade, they also revolution-

ized the capital markets. Sophisticated financial instruments became common place as financial centres emerged in London, New York, Amsterdam, Frankfurt and Paris. After 1870 these developments progressed further with technological developments in communications (notably the telegraph and trans-oceanic cables). There developed in these markets a wide variety of financial instruments (private debt and equity instruments), insurance instruments, an expanding role of government bond markets internationally, an explosion in the use of forward and futures contracts, and derivative instruments more generally. As Obstfeld and Taylor (2002) note, by 1900, bills of exchange, bond finance, equity issues, foreign direct investments, and many other types of transactions were a commonplace among the more developed countries, and among a growing number of nations at the periphery.

And as these financial markets became ever more sophisticated, and as banks became an everyday part of life, so too was the threat of banking collapses and speculative bubbles.

However as Figure 3 suggests the path to ever greater capital market liberalization was far from monotonic. However, it probably does not surprise you greatly given what we have just found out about the course of the world commodity trade. The period up to WWI was the period of booming trade and the Gold Standard, the latter a credible and stable fixed exchange rate system. Consequently, interest rates tended to converge–for just the same reasons that commodity market integration lead

Figure 1: Conjecture? A Stylized View of Capital Mobility in Modern History



Source: Introspection.

to commodity price convergence in real trade–and capital flows surged. In between the wars things fell apart as we noted above; capital markets became segmented and trade barriers went up. In the years following WWII, global trade boomed as trade barriers fell (the European customs union was formed), yet it took many years before capital controls were fully dismantled[5].

Obstfeld and Taylor (2002) examine the degree of capital market integration by looking at a number of factors, First, they consider gross stocks of foreign capital. Basically they add up all of a country's assets and liabilities, and then add up across countries. Table 2 in their paper presents the data. But the basic findings are as follows.

[5]For example, in the UK they were only fully dismantled in 1979.

Until the interwar period, the British share of total global foreign investment was around 80 percent. This is far above the recent U.S. share of global foreign assets, only 22 percent in 1995[6]. The only rivals to the British in the early nineteenth century were the Dutch, who held perhaps 30 percent of global assets in 1825. By the late nineteenth century both Paris and Berlin had also emerged as major financial centres.

An alternative indicator of the size of the international capital markets is the size of nineteenth century holdings of foreign assets. In 1870 Obstfeld and Taylor estimate that foreign assets were just 7 percent of World GDP. By around 1900–14 this number was just below 20 percent. In the interwar period, foreign assets fell and were 8 percent of world output in 1930. In 1938 they were 11 percent while in 1945 they were just 5 percent. In the post WWII period they have risen dramatically particularly towards the end of the twentieth century: 6 percent in 1960, 25 percent in 1980, 62 percent in 1995. In other words, the 1900–14 ratio of foreign investment to output in the world economy was not equaled again until 1980![7]

8.1 Real Interest Rate Convergence

If capital markets are integrated we would expect, other things constant, interest rates to be closely aligned across countries. O&T examine the statistical stationarity of long-term real interest differentials between Britain, France, and Germany. This

[6] It is also somewhat higher than the peak U.S. share of 50 percent in around 1960.

[7] The analagous data for the liabilities side of the balance sheet tell a similar story.

is an obvious measure of financial market integration. Visual inspection of the data (see Figure 3 in the paper) suggests no real interest rate divergence and is consistent with cointegration among these countries' interest rates: in short, the differentials between countries appear stationary. This finding supports the thesis of capital market integration. O&T also provide additional supporting evidence from other financial prices.

8.2 Equity and Bond Returns

O&T look at two issues:

1. have stock returns diverged or converged over time?, and
2. have the time series correlations of returns across countries changed over time?

There key finding is consistent with much of the above:

- Returns showed relatively little dispersion prior to 1914, but larger gaps opened up in the interwar period. This dispersion peaked around 1945/1950, and fell subsequently. Convergence was more notable still after 1980, roughly when G7 capital controls were loosened or abolished.

In other words: markets were free and efficient up until WWI, disrupted in the inter-war years and subsequent to the end of WWII, they became re-integrated.

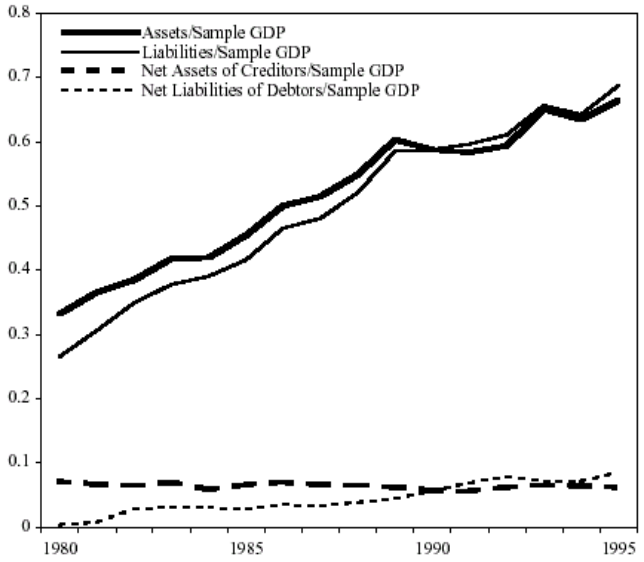
8.3 The Form of Capital Flows

One of the things to arise from the O&T paper is the fact that capital flows differ somewhat between the pre-WWI era and the post-WWII era, something that is particularly important for the developing countries. In the late nineteenth century the principal flows represented long-term investment from the core advanced economies to the developing economies. In addition these advanced economies were net lenders. The US is the exception here: there were both large inflows and outflows into the US. In short Britain, but also France and Germany, financed other countries' capital accumulation, and in doing so, developed a huge capital account surplus. The 1980s and 1990s are very different. O&T cite the US which in this latter period is both the world's largest net debtor and creditor nation. However, while it held the largest stock of gross foreign liabilities it also held the largest stock of gross foreign assets. In other words, in the pre-WWI era, by and large advanced countries invested long-term in developing countries. In the post-WWII period that is no longer the case. Since 1980, O&T find that the net foreign asset (or liability) positions in the world economy have remained very low: unlike the gross stocks, the net stocks have increased very little in this period.

To quote O&T then:

> "Thus, for all the suggestion that we have returned to the pre-1914 type of global capital market, there is one major qualitative difference

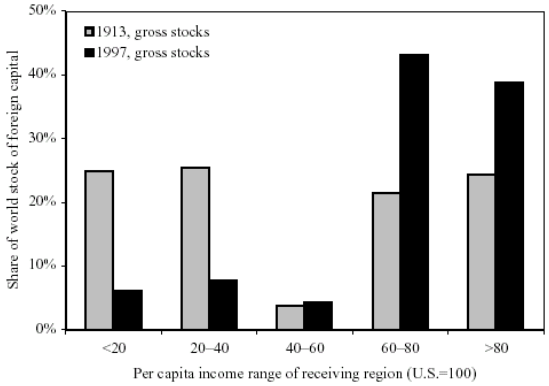
Figure 9: Foreign Capital Stocks: Net Versus Gross



Source: IMF.

between then and now. Today's foreign asset distribution is much more about asset "swapping" by rich countries—diversification—than it is about the accumulation of large one-way positions—a critical component of the development process in poorer countries in standard textbook treatments. It is therefore more about hedging and risk sharing than it is about long-term finance and the mediation of saving supply and investment demand between countries. In the latter sense, we have never come close to recapturing the heady times of the pre-1914 era, when a creditor like Britain could persist for years in satisfying half of its accumulation of assets with foreign capital, or a debtor like Argentina could similarly go on for years

Figure 10: Did Capital Flow to Poor Countries? 1913 Versus 1997



Sources: The 1913 stock data are from Woodruff (1967) and Royal Institute for International Affairs (1937), incomes from Maddison (1995). The 1997 data are from Lane and Milesi-Ferreti (2001), based on the stocks of inward direct investment and portfolio equity liabilities.

generating liabilities of which one half were taken up by foreigners. Instead, still to a very great extent today, a country's net wealth will depend, for accumulation, on the provision of financing from domestic rather than foreign sources (Feldstein and Horioka 1980)."

8.4 Capital Flows to LDCs

Figure 10 captures this crucial difference between the two eras of globalization. And O&T argue that it signifies that in a way the globalization of capital markets recently remains *behind* the level attained under the gold standard.

Globalized capital markets certainly seem to exist today but the difference is stark: "capital transactions seem to be mostly a rich-rich affair, a process of "diversification finance" rather than "development finance." The creditor-debtor country

pairs involved are more rich-rich than rich-poor, and today's foreign investment in the poorest developing countries lags far behind the levels attained at the start of the last century. In other words, we see again the paradox noted by Lucas (1993), of capital failing to flow to capital-poor countries, places where we would presume the marginal product of capital to be very high." (Obstfeld and Taylor, op. cit.).[8]

So why does capital not flow to the poorer countries. Let us turn to the arguments of Lucas (1993) in some detail.

9 Why does capital not flow to poor countries? – Lucas, AER 1993

9.0.1 Base case The following breaks up the steps in Lucas's 1993 article. You need to read the article to fill in the words.

$$y = Ax^{\beta} \tag{1}$$

$y = Y/N$, $x = K/N$.

$$\frac{\partial y}{\partial x} = \beta A x^{\beta-1} \tag{2}$$

$$x = A^{-\frac{1}{\beta}} y^{\frac{1}{\beta}} \tag{3}$$

[8]Mussa (2001) puts a slightly different spin on the data arguing that capital markets are starting to invest in poorer countries.

$$\frac{\partial y}{\partial x} = r = \beta A \left(A^{-\frac{1}{\beta}} y^{\frac{1}{\beta}} \right)^{\beta - 1} \tag{4}$$

$$r = \beta A^{\frac{1}{\beta}} y^{\frac{\beta-1}{\beta}} \tag{5}$$

Let $\beta = 0.4$, $(Y/N)_{US} = 15 \times (Y/N)_{INDIA}$

$$\frac{r^{INDIA}}{r^{US}} = \frac{\beta A^{\frac{1}{\beta}} (y^{INDIA})^{\frac{\beta-1}{\beta}}}{\beta A^{\frac{1}{\beta}} (y^{US})^{\frac{\beta-1}{\beta}}} = \frac{(y^{INDIA})^{\frac{\beta-1}{\beta}}}{(y^{US})^{\frac{\beta-1}{\beta}}} \tag{6}$$

Since $\frac{\beta-1}{\beta} = -1.5$, let $y^{INDIA} = 1$

$$\frac{r^{INDIA}}{r^{US}} = (15)^{1.5} = 58.094 \tag{7}$$

9.1 Differences in human capital

Now let $y = Y/N^e$, where N^e denotes effective labour. Kreuger estimates that one US worker is 'worth' 5 Indian workers. It is still the case that $(y)_{US} = 15 \times (y)_{INDIA}$, so that

$$\frac{r^{INDIA}}{r^{US}} = \left(\frac{(Y/N^e)}{15(Y/5N^e)} \right)^{\frac{\beta-1}{\beta}}$$

$$r^{INDIA} = 3^{1.5} r^{US}$$

$$r^{INDIA} = 5.2 r^{US} \tag{8}$$

9.2 External Benefits of Human Capital

Reinterpret the production function: assume the level of the economy's technology is an average of workers human capital:

$$y = Ax^{\beta}h^{\gamma} \tag{9}$$

$y = Y/N^e, x = K/N^e, h = H/N^e$, H is human capital.

$$\frac{\partial y}{\partial x} = r = \beta A x^{\beta-1} h^{\gamma} \tag{10}$$

$$x = y^{1/\beta} A^{-1/\beta} h^{-\gamma/\beta}$$

so

$$r = \beta A h^{\gamma} \left[y^{1/\beta} A^{-1/\beta} h^{-\gamma/\beta} \right]^{\beta-1}$$

$$r = \beta A^{1/\beta} y^{(\beta-1)/\beta} h^{\gamma/\beta} \tag{11}$$

So think of h^{γ} as an external effect: it scales up the productivity of any worker. If Kreuger's estimates are plausible, then

$$h_{INDIA}^{\gamma/\beta} = \frac{1}{5} h_{US}^{\gamma/\beta}$$

$$\frac{r^{INDIA}}{r^{US}} = \frac{5^{-1}}{3^{-1.5}} = 1.04 \tag{12}$$

9.3 Capital Market Imperfections

This part of Lucas's article is not covered in the course and is not examinable. I include this part of his algebra in case you are interested o work through it.

$$f(x) = y \tag{13}$$

$$f^{'}(x) = MPK \tag{14}$$

$$xf^{'}(x) = \text{total return on capital} \tag{15}$$

$$f(x) - xf^{'}(x) = \text{ wages} \tag{16}$$

$$F = f(x) - \Big[f(x) - xf^{'}(x)\Big] - rx \tag{17}$$

$$\frac{\partial F}{\partial x} = 0 = f^{'}(x) - \Big[f^{'}(x) - \Big(f^{'}(x) + xf^{''}(x)\Big)\Big] - r$$

$$f^{'}(x) = r - xf^{''}(x) \tag{18}$$

Let $A = 1$.

$$y = x^{\beta} \tag{19}$$

So we get:

$$\begin{aligned}
\frac{\partial y}{\partial x} &= \beta x^{\beta-1} \\
&= r^W - x\left[(\beta-1)\beta x^{\beta-2}\right] \\
&= r^W - x\left[\left(\beta^2-\beta\right)x^{\beta-2}\right] \\
&= r^W - \left(\beta^2-\beta\right)x^{\beta-1}
\end{aligned}$$

$$\begin{aligned}
r^W &= \beta x^{\beta-1}(1+\beta-1) \\
&= \beta^2 x^{\beta-1} \\
&= \beta r^C
\end{aligned} \tag{20}$$

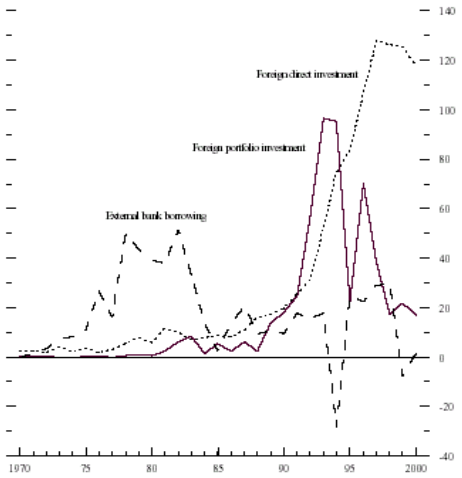
If $r^W \equiv 1$, and $\beta = 0.4$,

$$r^C = 2.5 \qquad \left(= \frac{1}{0.4}\right) \tag{21}$$

Chart 6. Net Flow of Investment to Developing Countries [1]

(Billions of U.S. dollars)

Net inflows of foreign investment to developing countries have grown rapidly since 1980, and flows of direct investment have been less volatile than flows of portfolio investment.



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