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A Review of O'Rourke and Williamson's *Globalization and History: The Evolution of a Nineteenth Century Atlantic Economy*[1]

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1. *Introduction*

GLOBALIZATION AND DIFFERING growth among countries have a long but somewhat interrupted history. In a world of globalized knowledge and markets, simple neoclassical growth models predict convergence of levels of income and of growth rates, but even within the "Atlantic Economy"—the culturally and institutionally similar economies of Europe and the regions of European settlement—convergence has been uneven (Moses Abramovitz 1986; Nicholas Crafts 2000). For a century before the First World War, technological change and economic policy led to globalization with uneven income convergence. The First World War disrupted globalization for more than a generation. Following the Second World War, globalization and income convergence again emerged as prominent trends. Much of the comparative economic history of the nineteenth century focuses on the spread of the Industrial Revolution from Britain. Incomes converged, in this view, as the transfer of superior technology raised incomes in the periphery. In *Globalization and History*, Kevin O'Rourke and Jeffrey Williamson provide a historically focused introduction to late nineteenth century globalization (which probably had greater impact on the various Atlantic economies than even the rapid globalization of the recent past) and challenge this technological approach. They argue that neoclassical effects of trade and factor supply changes provide more insight. Increased trade, stimulated by falling transportation costs, and factor movements caused prices of locally scarce factors to fall and promoted factor price convergence.

In the decades after the Napoleonic Wars, trade barriers fell dramatically, and capital and labor became exceptionally mobile. A dismantling of the byzantine tariffs, prohibitions, and regulations of the eighteenth century mercantilist empires began the process. From mid-century, the technology of iron and steam conquered distance, dramatically reducing the natural protection that transportation cost had hitherto provided. In the last quarter of the century, political reaction to imports

[1] *Globalization and History: The Evolution of a Nineteenth Century Atlantic Economy.* Kevin H. O'Rourke and Jeffrey G. Williamson. Cambridge, Mass.: MIT Press, 1999. Pp. xii, 343. $45.00. ISBN 0–262–15049–2.

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and immigration slowed international convergence somewhat, but did not eliminate it. To observers today, the globalization of factor markets seems even more striking than that of trade. Labor migrated largely free from government regulation, and technological improvement made international travel swift and safe. Foreign investment faced few regulatory impediments, while the new telegraph and improved stock markets made information more easily available and the international gold standard provided an international monetary standard whose stability investors today can only envy.

Globalization did not survive the First World War. Political forces were circumscribing the liberal regime before the war, and perhaps, as O'Rourke and Williamson argue, nationalistic backlash would have increased even without the war. In any event, the war fragmented the international economy, and post-war attempts at restoration ended disastrously in the Great Depression, autarchy, and renewed war. Globalization returned after the Second World War, but only slowly at first. Factor market globalization, in particular, lagged far behind what existed in the late nineteenth century. Only in the last few years has capital market integration rivaled that before the First World War, and labor markets are unlikely to return to the globalization that prevailed then.

2. *O'Rourke and Williamson: Convergence through Neoclassical Factor Price Effects*

O'Rourke and Williamson summarize and draw conclusions from a large research project (the bibliography contains over fifty relevant articles and working papers by the authors and their collaborators). They adopt a neoclassical view of international trade and international factor movements in which diminishing returns play a leading role. This framework is augmented by political analysis of governmental reaction to changes in income distribution caused by globalization. The emphasis on trade and factor flows naturally focuses attention on factor prices and factor price convergence. In contrast to much of the macroeconomics convergence literature, per capita income convergence becomes an implication of factor income changes rather than the primary focus.

Non-historians may find O'Rourke and Williamson's documentation of late nineteenth century convergence particularly revealing. Commodity prices converged dramatically, most strongly in bulky primary products traded over long distances where there were no tariff barriers. The ratio of British to Chicago wheat prices fell from about 1.6 in the early 1870s (and the gap had been even larger earlier) to only about 1.15 in 1913. Refrigeration and American packing houses brought even more dramatic meat price convergence—British meat prices fell from roughly twice American prices in the 1870s to under twenty percent higher in 1913. Tariffs protected domestic farmers in Continental countries, but even so, price convergence was impressive. Price gaps also narrowed dramatically between Asia and Europe, and within both North America and Europe, for manufactured goods as well as primary products (ch. 3).

The Atlantic economy's labor market integrated as some sixty million people emigrated from Europe, two-thirds of them to the United States. By O'Rourke and Williamson's estimate, immigration increased the New World labor force in 1910 some forty percent. At the extreme, Argentina's labor force was 86 percent higher; in the U.S., despite its position as the major receiver of immigrants, the

effect was a much smaller 17 percent. Emigration decreased Old World labor forces by eleven percent although with wide variation. In some economies the effect was small; in France 1 percent smaller and in Holland 3 percent, and more surprisingly, given their low real wages, in Spain 6 percent and Portugal 5 percent. Elsewhere the effect was large: in Ireland 45 percent smaller because of emigration; Italy 39 percent; Norway 24 percent; and Sweden 20 percent (Table 8.1, p. 155).

Capital market integration centered on London rivaled today's globalization. British savers at times invested more abroad than at home and foreign claims made up about a third of their wealth in 1913. Investors elsewhere in Western Europe, although less committed to international investment, sent 20 percent or more of their savings abroad. The resource-rich economies of recent settlement attracted most European capital, but large amounts also went to the European periphery. Capital flows dried up in the inter-war years and remained constrained by exchange controls after the Second World War. Capital flows relative to GNP today remain well below pre-First World War levels. Other indicators that O'Rourke and Williamson point out give a better indication of integration—interest rates and the Feldstein-Horioka coefficient of the relationship between saving rates and investment rates across countries (Figure 11.3, p. 216)—confirm that international capital markets were closely integrated by 1870. Recent reintegration of global capital markets has been impressive, but even by the late 1980s had only reached levels of a century earlier.

Convergence in the pre-First World War Atlantic economy differed from convergence today because the periphery contained two very different regions: the high-wage areas of recent European settlement and low-wage peripheral economies. Both figure in O'Rourke and Williamson's study. In the resource-abundant recent-settlement periphery, both labor migration and increased trade lowered wages and raised rents. In the labor-abundant European periphery the same forces, but primarily labor migration, raised wages and depressed rents. Unfortunately, analysis of the low-wage periphery, which is most relevant to modern debate, is restricted by data availability. Economies of Asia and Africa fall outside the analysis, and even within Europe data availability confines analysis of the periphery to Ireland, Scandinavia, Italy, and the Iberian Peninsula, while low-wage regions of central and eastern Europe are excluded. Even within the limited European sample convergence was uneven. Ireland, Scandinavia, and Italy converged toward both the European core and the resource-abundant economies, but Spain and Portugal did not. Low emigration from these societies kept real wages low.

O'Rourke and Williamson provide an impressive overview of the international integration of product and factor markets in a neoclassical framework and also trace the political reactions to changes to globalization in just under 300 pages. They of course summarize detailed research presented elsewhere, but the reader interested in assessing the research will be disappointed by a lack of detail. This is particularly disturbing since many conclusions come with an aura of precision and authority. For example, we are told that migration raised 1910 Irish wages by 31.9 percent while lowering American wages by 8.1 percent (Table 8.1, p. 155) and that the effects of migration were the overwhelming cause of real wage convergence. Many scholarly judgements lie behind this conclusion. How are

comparative real wages to be measured? What are the details of the model that provide the counterfactual wages? What statistical procedures were used and what is the precision of the estimated results? The reader is carefully directed to other publications and unpublished working papers but details are hard even for an experienced researcher to find and evaluate. The authors would command more confidence if they evaluated the sensitivity of the results to data and modelling choices. Providing definitive answers to important questions is a virtue, but there is danger in claiming more than careful research supports.

O'Rourke and Williamson find statistically significant income convergence (both β and σ), which does not emerge from wages and incomes in key economies but from the rapid income growth in a few small, initially poor economies of the European periphery (particularly Ireland and Scandinavia), and slow growth in Australia (see Fig. 14.1, p. 270). The analysis explains little of the differences in growth among the major countries either within the European core or between these economies and the resource-abundant periphery, particularly the United States. Instead, America's exceptional growth stands out despite the globalization forces. For example, O'Rourke and Williamson's analysis of the effect of product and factor market globalization predicts a considerable convergence of British and American wages. Convergence of product prices—principally foodstuffs—raises British real wages by 20 percent, but has little impact in America (pp. 67–68). Labor migration has nearly as great a relative impact. Britain was a major emigration nation (real wages up 5.6 percent) and the United States, the major receiver of immigrants (real wages down 8.1 percent; p. 155). Capital movement, however, significantly offset these impacts (British real wages down by 7.3 percent; American up by 0.1 percent; p. 237). Together globalization forces should cause the ratio of American to British real wages to fall from about 1.7 in 1870 to only about 1.3 at the outbreak of the war. In fact, American relative real wages increased slightly faster than the British.

3. *A More Dynamic History*

The history of the Atlantic economies and current concerns of growth theorists suggest a more dynamic framework than O'Rourke and Williamson adopt. Successful growth economics must be able to model growth occurring endogenously. Initial endogenous growth models that depend on externalities to some macro aggregate have not fared well in explaining growth (O'Rourke and Williamson conclude, for example, that educational differences lack explanatory power in the late nineteenth century); but externalities, induced technological change, and induced capital formation (both human and physical) do seem likely to provide keys to understanding growth. History indicates that these forces acted at a more disaggregated level than current models propose.

3.1 *Technology, Resources, and Accumulation in America*

America's exceptional growth arose from characteristics that defined its place in the global economy—resource abundance, the rapid increase of the size of the market, and America's particular pattern of technological change. Hints of the story in the form of resource abundance appear in O'Rourke and Williamson's narrative. They acknowledge that American high wages arose from abundant resources and not a high capital-to-labor ratio, as the

Heckscher-Ohlin framework that underlies their analysis suggests. Nonetheless they talk of capital chasing labor to America. Surely, immobile American resources simultaneously attracted both capital and labor. Furthermore, the highly spatial nature of nineteenth century America raises questions about their neoclassical model. Exploitation of American resource abundance involved movement of the frontier that required capital in the form of railroads and supporting towns and labor in new locations. Without capital in new locations, land and raw materials would have hardly influenced wages.

Nineteenth century technology simultaneously drove globalization and greatly enhanced resource abundance in America. When Thomas Jefferson purchased Louisiana in 1803, he paid $15 million dollars to obtain control of the lower Mississippi, and much of the continent was included, more or less free. The interior resources had little value with eighteenth century technology. It turned out, however, that the dynamic evolution of a new technological regime favored the United States. The Industrial Revolution introduced three macro innovations—cheap metal, steam power, and the use of "clockwork" (as Richard Arkwright and his contemporaries called it) to automated production which originated paths of technical learning that proved exceptionally fruitful for over half a century. All three had their greatest payoffs in America.

Iron and steam drove both nineteenth century globalization and American resource abundance. Iron and steam had wide applications, but eventually had their greatest impact in revolutionizing transportation, first on rivers and then with the railroad and the ocean steamship. Cheap transportation came both from improved technology arising from purposeful learning and from economies of scale. Immediately after Robert Fulton's *Clermont* first used steam power on the Hudson River in 1807, steamboats revolutionized transportation in the American West. Transportation improvement and geographic expansion continued for a century, culminating with the "closing of the American frontier" in 1890 and then settlement of the Canadian prairies (A. R. Hall 1968; Harley 1978, 1996).[3] Improvement of transportation increased incentives for capital formation, industrial concentration, international specialization, and for labor and capital migration. O'Rourke and Williamson's separation of trade and factor movements from accumulation and technical change ignores key relationships between globalization and growth. Technology and geographic expansion raised the return on capital, and probably introduced periods of increasing returns in labor and capital in regions like America that possessed extensive frontiers. The transportation network exhibited economies of scale: greater intensity of the use of the railroad system and the heavier track and larger trains it permitted lowered freight rates. The urban network required by the continental economy based on specialization of production and long distance exchange also contained indivisibilities and economies of scale.

In a simple growth accounting framework, rapid population growth and capital accumulation that raised the relative capital–labor ratio caused America's exceptional growth. Population growth, capital formation, and technical change were all intertwined with America's

[3] Some of the most famous articles in modern economic history have convincingly argued that the railroads made only modest difference to the late nineteenth century American economy (Robert Fogel 1964). This conclusion, however, rests on the availability of water transport that used the same basic technology.

position in the world economy. Population growth owed much to immigration. Increases in domestic saving rates financed rapid capital formation, although European investment contributed. One view sees Civil War finance exogenously causing higher American savings (Williamson 1974a,b). However, a more endogenous view of capital-using technology inducing higher accumulation by raising the return to capital, and sustaining capital income even though the capital-labor ratio rose, seems more satisfactory (Abramovitz and Paul David 1973; David 1977).

The technological change that sustained American investment and resource abundance had an asymmetric impact because its principal effects occurred on geographically expanding frontiers. The European core and some areas of the periphery without a fertile frontier gained much less. Canada is a striking case in point. Although it would surprise O'Rourke and Williamson's readers, Canada lacked a frontier once the fertile lands of southern Ontario were settled at mid-century and grew slowly from 1860 to 1900. Rather than being an immigrant destination, Canada had the world's highest rate of emigration (exceeding even Ireland in every decade except the 1870s). Finally at the turn of the century, with America settled, the frontier appeared in the Canadian prairies and Canada boomed, with higher domestic savings, capital imports, and immigration (Allen Green and M. C. Urquhart 1987; Marvin McInnis 2000).

3.2 *The American System of Mass Production*

America's nineteenth century success did not rest solely on investment to expand the frontier. American firms led the development of mass-production technology that improved and extended use of power-driven "clockwork" in production. American conditions led firms to use different production techniques than the British developed in the Industrial Revolution, and American technological change proceeded from this root. Ford's 1913 moving assembly line symbolized the technical achievement in raised labor productivities substantially above those in similar European industries. America's most successful firms became large corporations that integrated raw material procurement, mass production, and mass distribution under newly developed managerial structures (Alfred Chandler, Jr. 1990).

American manufacturing firms and their machinery suppliers developed mass production technology. As Gavin Wright recently emphasized (1997, p. 1564): "Technological change is fundamentally a form of learning, and learning is a network phenomenon. . . . The *network* may be subject to increasing returns to scale, if there are externalities in this process of collective learning. . . . " The economies of technological networks are analogous to the economies of a physical network like a railroad. Existing trunk lines, track characteristics, etc., increase the profitability of investment that is complementary to the existing network while raising the cost of investment that requires its substantial modification. Technological networks' infrastructure of knowledge, experience, procedures, and suppliers increases the expected payoff (and/or lower expected costs) of investment in certain technical areas while discouraging others. The importance of knowledge infrastructure shows most clearly in the continuing modification of new techniques that play a large role in productivity advances. As Wright observes, "at any moment of time a great many networks may coexist, depending on the specializations and technical

issues involved. But at an earlier historical phase (i.e., before the First World War), technological networks strongly overlapped with nationhood." (Nathan Rosenberg 1996)

Close connections existed between European and American manufacturers and scientists, but the network that developed and spread the "American System" arose from an environment with three important persistent features that Europeans did not equally share—a mass market, cheap power and raw materials, and a malleable labor force (Abramovitz and David 1996; Steven Broadberry 1997; David Hounshell 1984; Richard Nelson and Wright 1992; Rosenberg 1982, 1994; Wright 1990). The mass market—which allowed the long runs of standard production—rested on the size and wealth of America. In 1870, the United States' GNP was about 15 percent larger than that of the United Kingdom and growing twice as fast. By 1910 American GNP was two and a half times that of the United Kingdom. Faster American population growth, mostly the result of immigration, accounted for about 60 percent of faster growth. In addition, a high ratio of resources to labor further aided development of a mass market by generating both high real wages and a relatively equitable distribution of income. Early mass production increased labor productivity by using large amounts of energy and raw materials; these were cheap in part because of America's size but also because technical change reduced transportation costs. American resource abundance increased over the late nineteenth century both because transportation improved and because private and public investment discovered new resources (David and Wright 1997). Labor market equilibrium also supported American mass production. The successful introduction of assembly line production of standardized products in large corporations required a labor force willing to accept high work intensity and tight managerial control in exchange for high wages. American factory workers accepted this package; European (and nonimmigrant American) workers rejected it. Immigrants and their sons made up over 60 percent of America's machine operatives in 1910. These unskilled but ambitious individuals, already committed to change, found high-wage but demanding employment packages attractive (William Lazonick 1990; Wayne Lewchuck 1987, 1992; Wright 1987).

3.3 *British Specialization in a Multilateral Global Economy*

Of course, globalization did not only affect America. O'Rourke and Williamson use trade theory to focus on factor prices, but to understand late nineteenth century globalization we need to use trade theory also to look at multilateral specialization that affected various industries differently. Britain's experience highlights several important issues. In a simple view, Britain was a key core economy that increased its specialization in manufacturing, but a closer look reveals relative deindustrialization and the preservation of a manufacturing sector dominated by old industries. These features, often seen as British failures, arose as a consequence of globalization.

The spatial separation of production and consumption inevitably brought with it an increase in transaction services—transportation most obviously, but equally, specialized financial, marketing, and insurance needed in a much more complex economy (John Wallis and Douglass North 1986). Many of those services have agglomeration economies and tend to concentrate in a few centers. In the late nineteenth century

they concentrated in Britain. During the third quarter of the nineteenth century, Britain imported increasing proportions of its food and raw material. Exports of manufactured goods financed many of these imports but by the end of the century commodity exports accounted for only half of Britain's foreign earnings. The earnings from invisible transaction services and overseas capital provided the other half. Transaction services—ocean shipping and the City of London's financial and commercial services—became important by mid-century and continued to grow, but by the century's end, earnings of British owners of capital overseas equaled them. Invisible earnings financed imports, and fewer exports of manufactured goods were required, and the proportion of British income arising from manufacturing increased only slowly.

British manufactured exports grew slowly and remained concentrated in "old" industries of the Industrial Revolution—textiles, iron, and coal. At the same time Britain became the largest importer of "new" industrial goods—machinery, particularly electrical machinery, modern chemicals, modern steel, etc.—from other core economies. Many contemporaries and subsequent historians saw this as an early sign of British failure, to be blamed on poor entrepreneurship. But specialization seems better understood as a part of multilateral trading patterns. Globalization led to a rapid rise in Continental European and American use of imported raw material (Continental food imports were limited by protective tariffs). By and large these imports came from Latin America and Asia. The primary product exporters' demands for industrial goods remained concentrated in the "old" producers' (railroad materials, coal, etc.) and consumer goods (textiles). Despite the old and relatively stable technology in these industries (British engineering firms sold turnkey installations to foreign customers), the benefits of learning externalities accumulated. The Industrial Revolution made British firms technical leaders, and they remained low-cost producers even though British wages were high. Britain's advantages in these industries did not extend to newer technologies. Continental economies exploited comparative advantage by financing their raw material purchases, not by exporting directly to the raw material exporters but by selling "high tech" exports in the open British market (S. B. Saul 1960; Harley 1994). The Industrial Revolution and global comparative advantage led to a British technological network that differed from that in either America or Continental Europe. Certainly, Britain fell somewhat behind in "new" manufacturing but gained experience as a leader in international services. Unfortunately, deglobalization following the First World War devalued the dynamic potential Britain had developed in service.

4. *Concluding Remarks*

Globalization is a complex process. O'Rourke and Williamson's neoclassical comparative static analysis provides important insights. Modern economic growth, however, occurs through learning processes influenced by the vagaries of multilateral specialization and the highly uncertain path of technical change. Globalization not only leads to specialization and concentration of commodity production, it also requires large sophisticated service industries. In Britain, international services displaced potential manufacturing growth. Services are often seen as providing inferior jobs and offering fewer dynamic

possibilities for growth than manufacturing; it is more fruitful to see growth requiring increasing amounts of services. The knowledge economy resides in service industries.

Modern economic growth rests on endogenous technical change created by firms and individuals responding to economic incentives shaped by technological knowledge networks. Before the First World War, many technologies and the networks generating them were specific to particular production processes, market conditions, and factor supplies, rather than being general to the economy or even to an industry. Technical advance occurs as a cumulative process: decisions create networks with externalities and, possibly, increasing returns. Past success in a particular area increased the likely return to future technical success in related areas, but learning—technological change—is highly uncertain. Multilateral trade in the global economy sustained "old" British industries that rested on learning networks from the Industrial Revolution, but that specialization may have hurt growth in the twentieth century. The "old" industries produced efficiency with small competitive firms that interacted in efficient markets. The firms had high-powered incentives for efficient production, but given the public good nature of knowledge, expenditure on research and development seemed relatively unattractive to them. America's distinct resource and market setting led to large integrated firms in many industries for reasons unrelated to R&D, but some of these firms became leaders in industrial R&D (Bernard Elbaum and Lazonick 1986).

The history of the half-century before the First World War contributes to our understanding of globalization and economic growth. However, the era had particular historical features. Technical improvement in transportation stimulated specialization and trade and also brought value to frontier resources and stimulated geographic expansion, most notably in America. Dynamic implications of America's particular situation contributed to exceptional growth. Globalization stimulated the very high rates of international factor mobility and the high rates of capital formation in America that appear as the period's most striking features. O'Rourke and Williamson's analysis within a neoclassical framework provides compelling insights in the case of some of the small economies of the European periphery, but appears inadequate for comparing the growth experiences of the European core and the economies of the periphery of recent settlement. The analysis does not explain the main differences between the regions, and more significantly, the neoclassical framework fails to illuminate dynamic issues. Economic historians have found dynamic features that should interest policy makers and new growth economists, and O'Rourke and Williamson's failure to discuss them is a disappointment.

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