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Authors

Flynn, Dennis O
Giraldez, Arturo

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“Born Again: Globalization’s Sixteenth-Century Origins
(Asian/Global versus European Dynamics)”

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by

Dennis O. Flynn and Arturo Giráldez
Department of Economics/Department of Modern Languages
University of the Pacific
Stockton, CA. 94211 U.S.A.
doflynn@pacific.edu
agiraldez@pacific.edu
Phone: (209) 943-6408

Abstract:

Globalization began when all heavily-populated land masses began interacting – both directly with each other and indirectly via other land masses – in a sustained manner with deep consequences for all interacting regions; global interactions emerged during the 16th century when modern globalization was born. Dynamism emanating from within China played a pivotal role, while Europeans were (crucial) global intermediaries. Valid hypotheses concerning the emergence and sustenance of such a profound phenomenon as 'globalization' must accommodate evidence from numerous disciplinary debates. Any attempt to limit discussion of globalization's birth to strictly economic issues alone – such as the 1820's price-convergence hypothesis of O'Rourke and Williamson – are doomed. Instead, the central role of global economic history – and Chinese economic history in particular – becomes salient when located in a global/historical context that draws upon all disciplines.

“Born Again: Globalization’s Sixteenth-Century Origins
(Asian/Global versus European Dynamics)”*

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Dennis O. Flynn and Arturo Giráldez

University of the Pacific

doflynn@pacific.edu

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Tradition has limited historians in their search for the true significance of the renewed contact between the Old and New Worlds. Even the economic historian may occasionally miss what any ecologist or geographer would find glaringly obvious after a cursory reading of the basic original sources of the sixteenth century: the most important changes brought on by the Columbian voyages were biological in nature. (Crosby 1972, p.xiv)

1. Introduction

In private communication, a prominent historian suggested that our debate with O'Rourke and Williamson in the April 2004 issue of the *European Review of Economic History* – on the birth of globalization – seems like a sporting event in which players invent rules while the game is underway. The metaphor is apt in that contrasting definitions of the term ‘globalization’ have indeed led inevitably to divergent conclusions regarding whether globalization was born in the 16th century ((Flynn and Giráldez 2004) or in the early-nineteenth century when certain prices converged (O'Rourke and Williamson 2004).¹ A summary of these two respective viewpoints expressed thus far may be useful for readers of this *Review*:

* We wish to thank referees arranged by this Review, and Professor Ken Chan and other organizers and participants at a conference on "Lessons from History" held at Lingnan University, Hong Kong, 9-10 June 2006. Early versions of this paper were presented at the London School of Economics (October 2004), University of Amsterdam (November 2004), Oxford University (Wolfson College, November 2004), University of London (SOAS, December 2004), Osaka University (Graduate School of Letters, February 2005), Osaka University (Graduate School of Economics, February 2005), University of Tokyo (Graduate School of Humanities and Sociology, 2005), Whittier College (March 2005), Huntington Library (April 2005), and the All-UC World History Group at UCSD (May 2005). Although we have benefits from many suggestions and criticisms, personal acknowledgements are foregone here because this essay is essentially a rejoinder. In any case, we accept sole responsibility for remaining shortcomings.

¹ Among others, French historians Gruzinski (1999) and Wachtel (2001) also locate the birth of globalization in the sixteenth century. See Balachandran and Subrahmanyam (forthcoming) for discussion of these authors.

1. O'Rourke/Williamson position:

- definition: "we defined globalisation the way all economists are trained, as the integration of markets across space; and... we concentrated on one dimension of globalisation, namely commodity market integration. The best way to gauge that historical process of market integration is to measure the extent to which prices of the same commodities converge over time worldwide." (2004, p.109)
- Evidence: "the *only* irrefutable evidence that world commodity market integration took place is a decline in the international dispersion of commodity prices, or what we call commodity price convergence." (2004, p.113) Since price convergence occurred only from the 1820s onward, globalisation therefore began in the early 19th century.
- The O'Rourke and Williamson model (2004, p.111, Figure 1) used to explain these trends posits Europe's import demand vis-à-vis export supply in the rest of the world (i.e. Asia and America).
- In general, global trade is portrayed as a progression from autarky to free trade. China is particularly singled out as autarkic, and therefore residing outside of dynamic global market forces that unfolded within Europe during the early 19th century.
- O'Rourke and Williamson describe the birth of globalization in purely economic terms, without reference to ongoing globalization debates underway in numerous disciplines beyond economics.

2. Flynn/Giráldez position:

- geographical definition: "Globalization began when all heavily-populated land masses initiated sustained interaction – both directly with each other and indirectly through other land masses – in a manner that deeply and permanently linked them."
- Evidence: Statistical evidence alone is insufficient to establish the beginning of globalization, a broad and profound phenomenon with multifarious linkages around the globe. Flynn and Giráldez invoke economic, environmental/ecological, epidemiological, demographic, and cultural evidence to demonstrate geographical connection of all three 'one-thirds' of the surface area of the globe (Pacific Ocean = 1/3, Americas + Atlantic Ocean = 1/3, and AfroEurAsia + Indian Ocean = 1/3) beginning in the sixteenth century.
- Term 'Born Again' intentionally invoked in this essay, in order to remind readers that humans had already migrated to all of today's populated land masses prior to the end of the last Ice Age. Global warming subsequently caused world oceans to rise, thereby isolating the Americas from the AfroEurAsian 'Old World' for more than 10,000 years. Reconnection of the Americas with the Old World – via both the Atlantic and Pacific Oceans – began in the sixteenth century, thereby giving birth to today's phase of globalization.

- Huge demand emanating from China was a dynamic economic force that shaped the birth of globalization in the sixteenth century, as well as subsequent centuries. Europeans played key roles as intermediaries, but it is inaccurate to portray Europeans as the sole (or even primary) source of dynamism. European traders were middlemen.
- It is a grave error to restrict conceptualization of globalization to the sphere of economics alone, since global economic forces have evolved in a deep and intimate intermix with non-economic global forces over the past five centuries. Globalization is inherently interdisciplinary and narratives of economic globalization must be shown to dovetail with non-economic aspects of globalization that are widely discussed throughout numerous disciplines today.

Terminology in the social sciences is contentious because few definitions are unequivocally accepted by all. The term ‘globalization’ is no exception, since it aims to encompass social processes with manifold characteristics. Our intention is to show that globalization is a historical process with sixteenth-century origins. Definition of terms is revisited below in Section 2.

We argue that 19th-century price convergence was not a seminal event in globalization history, as suggest by O’Rourke and Williamson, but rather represents a later (albeit important) phase that evolved along with the Industrial Revolution some 250 years after globalization’s 16th-century birth. Evidently unpersuaded by our argument, O’Rourke and Williamson have responded by recommending that we adopt their research strategy: “We would be delighted if Dennis Flynn, Arturo Giráldez, and other pre-industrial world economy specialists were to take this empirical challenge seriously, and produce more long-run price data that can speak to the issues of when globalization started, and what drove the post-Columbus expansion of world trade.” (O’Rourke and Williamson 2004, p.117) We do indeed take this empirical challenge seriously, while maintaining that globalization’s scope extends far beyond conventional boundaries of economic history – let alone the relatively-narrow issue of price convergence – and that no amount of statistical analysis could suffice to establish globalization’s birth date. Statistical analysis is simply not suited for the task of identifying structural changes at a global level over several centuries, in the same sense that econometric techniques are ill-suited for identification of the big-bang origins of the universe, the verity of plate tectonics, or the origins of the human species. Overarching narratives are required to unravel issues of such broad scope. Statistical analysis is of course indispensable throughout the sciences, but statistical techniques are applicable to a limited range of questions. The broader the subject matter, the less likely are econometric tools appropriate. Our definition of globalization is far broader than the price-convergence alternative proposed by O’Rourke and Williamson, as pointed out already; it would thus be meaningless to apply their statistical techniques to sweeping issues that we deem central. Empirical evidence of a non-statistical nature will have to suffice.

O’Rourke and Williamson seem to portray long-term global economic history as involving evolution away from autarchic regions – caused in part by anti-trade

institutions – toward free-trade policies that eventually led to market-integrating price convergence in the early-nineteenth century.² Their model and statistical work are designed to ferret out the timing and source of the transition from autarky to market connection: “The price behaviour at home [read: Europe] of importable and exportable goods, relative to non-tradable goods, will help tell us which of five sources are doing most of the historical work – world market integration, demand boom at home, supply boom at home, demand boom abroad or supply boom abroad.” (O’Rourke and Williamson, 2004, p.110) They go on to state: “It follows that Euro-Asian and Euro-American trade must have boomed after 1492 in spite of barriers to trade and anti-global mercantilist sentiment. There would have been a bigger trade boom without them. *We stress that Flynn and Giráldez have not challenged this evidence or this inference from it.*” (O’Rourke and Williamson, 2004, p.111, italics in original) It seems to us that O’Rourke and Williamson already cede the economic portion of our argument when acknowledging that global trade "boomed after 1492"; they simply assert that this boom would have been more pronounced in the absence of ‘mercantilist sentiment’. We return to the role of ‘mercantilism’ in the next paragraph, but it is important to first point out that the birth of an organism is a prerequisite for its maturation. Just as a child’s birth is a precondition of evolution into adulthood, so too globalization must have experienced birth as a precondition for evolution into today’s stage of globalization. It will be demonstrated in this essay that unique characteristics of globalization’s birth continue to influence the trajectory of global developments in numerous profound ways. Moreover, we argue that China played a pivotal role in the unique evolution of global connections over the past half-millennium.

Discussion of global history cannot be limited to "Euro-Asian and Euro-American trade," as contended by O’Rourke and Williamson, because direct linkages between Asia and the Americas (via the Pacific Ocean)³ as well as multifarious global connections with Africa

² O’Rourke and Williamson (2002a, pp.418, 439-42; 2002b, p.37), for example, assert that China regressed to become an autarchic entity by the middle of the 15th century. Commenting on the dynamic economic and cultural expansion of China before the Industrial Revolution, by way of contrast, Ringrose (2001, pp.161, 172) states that one “of the paradoxes of world history is that China...does not have an image as an expansive society....despite official withdrawal from maritime expansion, China continued its process of cultural expansion into Southeast Asia...Mongol and early Ming expansion promoted, but did not begin, the spread of Chinese communities in Vietnam, Malaysia, Thailand, Indonesia, and the Philippines. Thus, while the Emperor ended Zhenghe’s expeditions after 1435 and prohibited construction of large ships, such actions did not stop Chinese trade with the rest of the world.” Indeed, characterization of Ming/Qing China as ‘autarkic’ flies in the face of a generation of scholarship on Chinese history. Recent English-language examples include Hamashita (1994), Sugihara (2001), Wong (1997), Marks (2007), Pomeranz (2000), Perdue (2006) and too many others to list.

³ See the seventeen-volume series *The Pacific World: Lands, Peoples and History of the Pacific 1500-1900*. Aldershot and London: Ashgate Variorum 2001-present, for which we serve as General Editors.

played crucial roles as well.⁴ Moreover, globalization did not arise concurrently with the emergence of so-called free markets. Advance in maritime technology was certainly a necessary condition for European intrusion into American and Asian waters beginning in the late-15th century, but global connections dating from the sixteenth century also involved attempts to dominate and to monopolize key markets. It is difficult to imagine anyone characterizing subsequent outcomes in terms of free-market economics. Great European commercial enterprises – Portugal’s *Estado da India*, the global reach of Imperial Spain, the Dutch East India Company (VOC), and English East India Company, and others – introduced a degree of armed trading into maritime Asia that was unprecedented; these Europeans battled each other, as well as Asian interests for centuries in pursuit of profit (although it must be acknowledged that a multitude of Asian merchant interests may have benefited as much – perhaps more – than European counterparts who competed and cooperated via merchant supply chains linked throughout the globe).⁵ Restricted access characterized all important markets, including spices, ceramics, silks, cotton textiles, tea and silver. Indeed, guarantee of market access on several global landmasses simultaneously necessitated invocation of maritime military might by competing European powers; thus, coercion and military violence went hand-in-hand with European trading enterprises. With reference to O’Rourke and Williamson terminology, so-called ‘anti-global mercantile states’ played key roles in *creating* global marketplace linkages, rather than thwarting connections.⁶ In short, we claim that global market linkages required sponsorship by various state institutions,⁷ while O’Rourke and

⁴ For an overview of how deeply Africa was linked to global *monetary* developments alone – via gold, silver, copper and cowry shells – since the 16th century, see Flynn and Giráldez (1997).

⁵ Analyses of a dozen "commodity chains" provide global perspective for reevaluating five centuries of Latin American history; see Topic, Marichal, and Franks (2006). Also see Souza (2005), a synthesis that applies "merchant supply chain analysis" to elucidate proto-industrial supply of natural (sappanwood) red dyes (Souza 2004a) and mordant (Chinese alum) in global textile production (Souza 2004b).

⁶ In terms of linkages between the African slave trade and global markets, Klein (2004, p.214) states that both the Portuguese “and all Europeans who followed used heavy state control in the form of taxation, subsidization, or monopoly contracts to get the trade going and control its flow of forced workers to America. In almost every case, the state was needed to subsidize the trade in order to get it organized. The Spaniards even declared it a royal monopoly and eventually developed a complex exclusive arrangement called the *asiento* for selling the right to deliver slaves, a system that lasted until the end of the 18th century.”

⁷ O’Rourke and Williamson (2002b, p.47) acknowledge the use of force and early-modern market connections, but they deny that these linkages constitute ‘globalization’: “...the sixteenth and seventeenth centuries saw violent conflict over who would control the South East Asian spice trade. But a world in which monopoly rents, mercantilist intervention, and better warships played such an important part in intercontinental trade was not a world whose economy would be considered globalised by today’s standards.” Again, this conclusion follows only if the reader accepts the O’Rourke and Williamson definition of globalization, which we do not.

Williamson portray globalization's birth in terms of a movement *away from* anti-market government intervention and toward free-market processes. We insist that all heavily-populated landmasses became connected during the sixteenth century, aided by military force and motivated by restricted market access. Market incentives played key roles, of course, but 19th-century price convergence eventually evolved from centuries of government-sponsored attempts to manipulate market access around the globe.

Recent literatures challenge assertions to the effect that European economies were free-market incubators on the eve of the Industrial Revolution. In *The Great Divergence*, for example, Ken Pomeranz states that free-market economies were, if anything, more prevalent within East Asia than within pre-Industrial Europe:⁸

...in the most crowded societies of all – China – the share of the harvest that was marketed over long distances seems to have been considerably higher than in Europe. Wu Chengming has conservatively estimated that 30,000,000 *shi* of grain entered long-distance trade in the eighteenth century, or enough to feed about 14,000,000 people. This would be more than five times a generous estimate of Europe's long-distance grain trade at its pre-1800 peak and over twenty times the size of the Baltic grain trade in a normal year during its heyday.... Eighteenth-century China (and perhaps Japan as well) actually came closer to resembling the neoclassical ideal of a market economy than did western Europe. (Pomeranz, 2000, pp.34, 70)

Balachandran and Subrahmanyam (forthcoming), prominent historians of India during early globalization, also criticize O'Rourke and Williamson's "canonical narrative of globalization...[that] assumes that the centuries between 1500 and 1800 were marked by 'trading monopoly markups, tariffs, non-tariff restrictions, wars and pirates.'" The Balachandran and Subrahmanyam rebuttal of the O'Rourke and Williamson "autarky-to-free-market hypothesis" warrants citation at length:

The evidence in fact quite clearly suggests that until 1750, tariffs were remarkably low [in the Indian Ocean], and that the only significant trading monopoly markups other than those imposed by the European companies, were to be found on those rare occasions when Mughal officials decided to corner the market in a particular good (the so-called *sauda-yi khass* regime). Nor indeed can it be argued that 'wars and pirates' were a factor that was of greater significance in the centuries preceding 1750 than those that followed. Rather, we can broadly

⁸ Sugihara (2001, 61) likewise rejects outmoded views of Asian autarky:: "recent literature generally confirms that monetization, commercialization of agriculture and the development of proto-industry were all present in India and China. Feudal restrictions are likely to have been more severe in Continental Europe and Japan than in China and India. It was much easier for the Chinese peasant to become a merchant than the German or Japanese peasant, while Indian capital appears to have traveled long distance just as freely as its most mobile European counterpart."

characterize this period as one that corresponds to a notion of 'free trade', save when conflicts broke out between the European Companies and one or the other Asian power. Certainly, tariff barriers were never imposed to limit the import into South Asia of Chinese, Japanese or Southeast Asian products. The situation on the overland trading routes leading from northern India to Central and West Asia was one where raiding and banditry were undoubtedly periodic features, but once again we cannot see this as a regime of 'mercantilist trading regime' in the sense of Eli Heckscher. It is thus incorrect to generalise from a limited view of a certain number of European states to a general characterization of early modern trade.

We can thus quite properly characterise the trading regime of the centuries from 1450 to 1750 in the Indian Ocean as one where 'free trade' was the rule, with the accompanying buoyancy and overall expansive tendency that characterises such a regime.

Far from depicting European free-market proclivities toward the rest of the world, in other words, Balachandran and Subrahmanyam describe militaristic European intrusion into maritime commercial relations that had previously been relatively free throughout the Indian Ocean.⁹ Asian autarky is a fiction, in short, as are European predilections toward free trade vis-à-vis Asia throughout the early-globalization period.

Epidemiological, ecological, demographic, and economic interconnections occurred on a global scale centuries prior to the early-19th-century phase of market integration, yet O'Rourke and Williamson have not responded to central aspects of our argument that focus on interdisciplinary interconnections. Publishers tell us that 'globalization' is the most ubiquitous term in the print world (both academic and non-academic) today. Publications from numerous disciplines speak of globalization today without reference to price convergence. We continue to argue that global trade proceeded hand-in-hand with diffusion of flora and fauna throughout the globe – both into and out of the Americas – since the sixteenth century, in a manner that physically transformed regions and land masses. Ecological transformations on a global scale, in turn, contributed mightily to demographic revolutions worldwide. Subsequent rounds of global trade activity reverberated across the centuries in response to demographic forces. And cultural transformations also accompanied economic, ecological, and demographic forces. For example, Strenski (2004, p.633) has studied interconnections between religion and economic history at a global level:¹⁰

⁹ On the other hand, international trade in early Tokugawa Japan was tightly controlled by the Bakufu. Raw silk imports from China were tightly controlled by the Japanese. The Portuguese could no longer compete with Chinese junks in importing raw silks to Japan. Instead, the Portuguese shifted to importing less-regulated Chinese silk piecegoods in the 1630s (before their expulsion from Japan). Japan's huge role in Asian international trade cannot be characterized as 'free trade' by any definition. See Souza (2004 [1986], pp.58-63)

¹⁰ For close connections between the spread of specific religions and trade patterns throughout the Pacific Ocean, see Storch (2006).

What *religious* legitimations made the first European global economic enterprises possible, and are they still active, perhaps below the surface, in justifying the economic globalization in our own time? I am arguing that today's language of globalization betrays an implicit religious depth....These original and explicitly theological justifications of early globalization are to be found in the writings and teachings of particular sixteenth- and seventeenth-century Christian theologians and doctors of jurisprudence, such as Spanish Dominican Francisco de Vitoria and the Dutch Calvinist Hugo Grotius.

Our vision of the origins of globalization permits dialogue across academic disciplines with extensive literatures on globalization and globalization history. As stated by Martin Lewis several years ago, globalization studies require interdisciplinary collaboration:

...the study of globalization has spread like a firestorm throughout the Academy. Almost every discipline in the humanities and social sciences has, through its own techniques and by way of its own concerns, shed light on crucial aspects of global connectivity. No single discipline, however, is able to grasp the phenomenon as a whole. Yet globalization is such a compelling topic that some form of coordinated inquiry is desirable. Hence a new 'paradiscipline' – that of globalization studies – is emerging. At schools across the country, institutes, study centers, working groups, and ongoing symposia are forming around an interdisciplinary effort to understand the global. Scholars have responded with a flood of interpretive works... (Lewis, 2000, pp.604-605)

O'Rourke and Williamson fail to address interdisciplinary connections that are central to our argument, as well as the concerns of scholars from numerous disciplines. To rephrase: How can scholars from the humanities, physical sciences, and other social sciences link their ongoing discussions of globalization and globalization history to the narrow price-convergence focus of O'Rourke and Williamson? We see little encouragement for the emergence of cross-disciplinary dialogue via their methodology. Just as the globe does not belong to any particular discipline, so too globalization history must be framed in a manner that excludes no academic discipline.¹¹

¹¹ For a recent globalization history that is multidisciplinary in scope, see Osterhammel and Peterson (2005, pp.46-47, 49), who reach conclusions compatible with our argument: "If we keep in mind how this historical era started, the famous question of 'how modern is the modern age?' can be answered very easily from the perspective of globalization. The discovery and colonization of America, the advance of European traders and soldiers in the Indian and Pacific oceans, the 'ecological imperialism' and the 'revolutions' in military and communication technology created the prerequisites for the expansion of existing spheres of interaction and the formation of new ones.... The first truly global trading networks resulted from the silver mined in the Spanish colonies in America."

Most 'globalization debates' today focus on recent events, many times limited to the post-World War II era. A useful book edited by David Held, *a globalizing world? culture, economy, politics?*, provides a (mostly) policy-oriented guide that breaks academic schools of globalization thought into three camps: 'globalists' (optimistic ones, and pessimistic ones), 'inter-nationalists', and 'transformationalists'.¹² Individual survey chapters focus respectively on society, culture, economics, and governance. None focuses on history *per se*, yet Held's introductory statement demonstrates a keen awareness of the historical backdrop of modern globalization studies:

For thousands of years, human beings have, of course, travelled – settling new lands, exploring the seas, building empires or searching for means of subsistence. However, it is important to recall that it is only in the last five hundred years that they have travelled the world, conquering and linking together the Americas and Oceania, Africa and Asia.... a new era of regional and global movement of people goods, information and microbes was established.

... In short, from the 'age of discovery' to the new millennium, processes of change have been underway that have altered the relations and connections between peoples and communities – processes which have been captured by the term 'globalization. (Held, 2004, pp.1-2)

In terms of economics *per se*, O'Rourke and Williamson (2004, p. 116-117) contend that our criticism of their approach is partly based upon misinterpretation of their usage of 'import demand' and 'export supply' concepts. But such is not the case. A distinct supply-and-demand model underlies our work, one that focuses explicit attention on inventory supply and inventory demand. Contrast of their supply-demand apparatus vis-à-vis ours is explored in Section 3, including discussion of the central role of Chinese demand and supply in initiating the birth of globalization in the 1500s. Our emphasis on demand-and-supply-side forces emanating from Asia contrasts sharply with O'Rourke and Williamson's emphasis on the primacy of demand-side factors centered in Europe. Again, divergent emphases stem from application of distinct models of supply and demand.

¹² David Held (ed.), *a globalizing world? culture, economics, politics*. London and New York: Routledge, 2nd ed., 2004. Another useful summary of multidisciplinary globalization debates is contained in Held and McGrew (2003, p.4), who touch upon the crucial issue of defining globalization in geographical terms: "With no identifiable geographical referents, how is it possible to distinguish the international and transnational from the global, or, for that matter, processes of regionalization from processes of globalization? It is precisely because much of the literature on globalization fails to specify the spatial referents for the global that, so the sceptics argue, the concept becomes so broad as to become impossible to operationalize empirically and, therefore, misleading as a vehicle for understanding the contemporary world."

Section 4 connects our argument with the controversial thesis of Ken Pomeranz that Europe's Industrial Revolution depended upon access – by select regions within Europe – to the vast resource base of the Americas. Our global narrative complements the overall views of Pomeranz – whose approach is comparative, but also framed within the context of explicit global connections – yet we emphasize the point that *resources of American origin became fundamental building blocks for non-European as well as European societies*.¹³ The Industrial Revolution does indeed mark a fundamental turning point in human history, but nineteenth-century developments were path-dependent and best conceptualized in the context of global forces emerging since the sixteenth century.

2. *Defining Terms*

O'Rourke and Williamson apply the scientific method in support of their contention that globalization's birth date occurred as late as the 1820s. They define globalization "the way all economists are trained, as the integration of markets across space; and in the articles under discussion we concentrated on one dimension of globalization, namely commodity market integration. The best way to gauge that historical process of market integration is to measure the extent to which prices of the same commodities converge over time worldwide." (2004, p.109) Econometric study of the price history of certain commodities leads to a key conclusion: "The central finding of our work is that there is very little evidence of world commodity price convergence in the three centuries after Columbus. And, to repeat, *nowhere do Flynn and Giráldez challenge our evidence or our inference.*" (O'Rourke and Williamson, 2004, p. 113, italics in original) In sum, O'Rourke & Williamson offer an explicit definition – perhaps one that does reflect "the way all economists are trained" these days – and their conclusion in favor of globalization's relatively-late birth date rests upon statistical evidence suggesting that price convergence did not occur until the 1820s. For those comfortable with an exclusive

¹³ Our view that Asian societies also gained access to an American resources – perhaps to an even greater extent than did European societies -- is contrasted with Ken Pomeranz's interpretation in Section IV below, but we both reject free-trade arguments that privilege internal developments within Europe: "Thus the distinction that some authors make between bullion extracted through coercion and a far more important flow of real resources obtained through consensual trade seem artificial. Not only were the land and labor that produced New World resource exports very much the fruits of extra-market coercion, but it took the unique arrangements of Caribbean plantations and of mercantilist policies throughout the New World to escape all the forces that caused core-periphery exchange within the Old World to plateau. Without these features, and without silver that helped pay for colonial administration and provided Asian goods to be transshipped to Africa and the Americas, it is hard to see how the 'ecological windfall' could have found its way to Europe in such quantities; nor is it clear how Europe could have obtained as much ecological relief from the rest of the Old World as it did." (Pomernaz 2000, pp.273-274)

concentration “on one dimension of globalization” (their words) – namely, price convergence – their results may seem convincing.

We remain unconvinced by the O’Rourke and Williamson argument, however, while stubbornly insisting that globalization was born in the sixteenth century. Our counter-argument does not deny that certain prices converged during the early Industrial Revolution – as portrayed by O’Rourke and Williamson – nor that price convergence may be connected to important historical developments. But 19th-century price convergence represents a trend in just one economic series. In other economic series – such as those for standards of living or productivity, we find a marked *divergence* from the 1820s onward (Goldstone 1998, 2000; Pomeranz 2000). What seems to us to be the most important factor to consider regarding the onset of globalization is not whether certain indices converged or diverged at a specific time, but whether people, products, and events that originated in one part of the world generated permanent and systemic effects on societies around the globe. In this sense, the 19th century price convergence and the Industrial Revolution in general, are both best depicted as having emerged two-and-a-half centuries after the birth of globalization.

We agree entirely with the position that it “seems to us that no scholar should engage in this important debate about the historical origins of globalization without first defining terms.” (O’Rourke and Williamson, 2004, p.109) Their next sentence, however, is mysterious to us: “Oddly enough, nobody else seems to do so” [i.e. define globalization]. This statement is inaccurate. We have offer an explicit definition of the birth of globalization in several articles, including the article (Flynn and Giráldez, 2004, p.83) cited by O’Rourke and Williamson in this journal. Let us restate our general definition here:¹⁴

Globalization began when all heavily-populated land masses initiated sustained interaction – both directly with each other and indirectly through other land masses – in a manner that deeply and permanently linked them.

Our argument applies a straightforward geographic definition susceptible to potential empirical refutation via multiple academic disciplines. This rejoinder’s title intentionally contains the phrase ‘born again’ because one could logically argue that the *original* birth of globalization occurred when humans initially migrated out of East Africa and populated all of today’s heavily-populated land masses. Thus, the modern sixteenth-century birth of globalization to which we refer can be considered a ‘rebirth’, rather than

¹⁴ Note that our definition of globalization here is deliberately broadened from the definition we provided previously: “Global trade emerged when all heavily-populated continents began to exchange products continuously – both with each other directly and indirectly *via* other continents – and on a scale that generated deep and lasting impacts on all trading partners” (Flynn and Giraldez, 2004, p.83). The ‘birth of global trade’ coincided with the ‘birth of globalization’ more generally. For reasons explored at length in Lewis and Wigen (1997), it is more accurate to refer to “land masses” rather than the imprecise term “continents.”

the *original* birth of global-human history. Humans already resided on all of today's heavily-populated land masses more than 12,000 years ago (Christian, 2004, p. 193), prior to the end of the most recent ice age. Melting ice caps raised sea and ocean levels toward the end of the last Ice Age, however, thereby isolating the Americas from Africa, Europe, and Asia more than ten thousand years ago. In other words, prior to the era of modern, post-16th century globalization upon which we focus, 'de-globalization' occurred more than ten thousand years ago as global warming melted icecaps, thereby raising sea levels and de-linking the Americas from rest of the world. Isolation of the Americas for thousands of years altered world history fundamentally. American flora and fauna developed along drastically different lines than anywhere else in the world during many thousands of years of isolation. Basic building blocks of American societies today – the horse, cattle, wheat, and sugar, to name just a few societal cornerstones – were totally absent when Columbus stumbled upon the New World in 1492. American landscapes today – from Alaska to Patagonia – were profoundly reshaped by the introduction of Old World flora and fauna. And the ecological exchange was no one-way street. At least one-third of the basic foodstuffs in the world today – including staples such as the potato, sweet potato, corn, the peanut, manioc, many beans, and tobacco – came exclusively from the Americas; these building blocks of society had been totally absent from the AfroEurAsian Old World prior to Columbus. In short, our argument is that the birth of globalization occurred more than four centuries ago when the Americas were finally reconnected – via trans-Atlantic and trans-Pacific linkages – with the AfroEurAsian Old World during the sixteenth century. The geographic logic is straightforward. The Pacific Ocean comprises 1/3 of the surface area of the globe. The Americas – South America, Central America, North America, plus the Atlantic Ocean – comprise approximately another 1/3 of the surface area of the globe. AfroEurAsia – including the Indian Ocean – therefore comprises the remaining 1/3 of the globe's surface area. For us, modern globalization was born in the sixteenth century when all three one-thirds of the surface of earth became permanently connected (or reconnected, if you wish). And we believe that our definition is best in terms of a multidisciplinary fit.¹⁵

Planet earth was decidedly disconnected prior to the 1500s since the Americas plus its surrounding oceans – that is, about two-thirds of the surface area of the earth – had become isolated from the AfroEurAsian 'Old World' (which comprised the remaining one-third of earth's surface area). From the 1500s, the entire globe became deeply intertwined. According to the logic of our definition, the 19th-century price convergence described by O'Rourke & Williamson occurred during globalization's third century; and we are living today during globalization's fifth century. The reader can escape these conclusions by simply rejecting our definition of the term globalization, of course, but we maintain that ours is most consistent with that of the *Oxford English Dictionary*, vol. VI (1989, p.582):

- global a.
1. Spherical, globular

¹⁵ For a well-balanced consideration of seas and oceans as frameworks for historical analysis, see Bentley's (1999) view of globalization's 16th-century origins.

2. ...pertaining to or involving the whole world...

globe sb....[...L. *globus* a round body or mass; a ball, sphere etc...]

This dictionary (pp. 582-583) then goes on to list scores of historical references that use the term globe and its derivatives, historical references that begin in the sixteenth century – not earlier, and not later.¹⁶ It is a fair criticism when some insist that the words 'globe' and 'global' are not quite the same as 'globalization'; true enough, but the latest edition of the *Palgrave's Dictionary of Economics* (Eatwell, Milgate, and Newman 1998) contains no entry whatever for 'globalization' and we have been unable to locate a suitable definition elsewhere in economics source books.

Are the intercontinental linkages to which we refer truly “deep” and “permanent,” as our definition requires? The answer is affirmative. Motivated by economic considerations – initially, access to the Asian marketplace – early European explorers unwittingly introduced deadly Old World diseases that decimated between 50% and 70% of the indigenous population of the Americas (Christian 2004, p.382), a demographic disaster repeated on Pacific islands later on. Epidemiological forces were transmitted aboard the same ships that carried trade goods as well as flora and fauna. It seems to us that decimation of the majority of the labor force of the Americas qualifies as a significant economic and social factor by any standard. And there were other global interactions of stunning impact. Although contact between Western and Eastern hemispheres led to annihilation of New World populations, reconnection of the Old World with the New World also eventually led to immense population expansions outside of the Americas. This occurred because New World crops spread worldwide – via the same ships that transported commodities and diseases – leading to population explosions throughout the Old World and elsewhere.¹⁷ Nowhere was the impact of introduction of American foodstuffs more dramatic than in Africa:

¹⁶ Similarly, the *Concise Oxford Dictionary* (2001) offers:

“Global... adj. 1. of or relating to the whole world; worldwide. 2. relating to or embracing the whole of something, or of a group of things.... DERIVATIVES
globalist n. globalization (also globalisation) n. globalize (also globalise) v. globally adv.”

¹⁷ Seemingly-isolated places like New Guinea were, in fact, ecologically integrated via global processes. Diamond (1997, p.149), for example, states that “in former times New Guinea’s available root crops were limiting for calories as well as for protein, because they do not grow well at high elevations where many New Guineans live today. Many centuries ago, however, a new root crop of ultimately South American origin, the sweet potato, reached New Guinea, probably by way of the Philippines, where it had been introduced by the Spaniards. Compared with taro and other presumably older New Guinea root crops, the sweet potato can be grown up to higher elevations, grew more quickly, and gives higher yields per acre cultivated and per hour of labor. The result of the sweet potato’s arrival was a highland population explosion...” (Diamond 1997, p.149)

The importance of American foods in Africa is more obvious than in any other continent of the Old World, for in no other continent, except the Americas themselves, is so great a proportion of the population so dependent on American foods. Very few of man's cultivated plants originated in Africa – only 50 out of 640, according to Vavilov – and so Africa had to import its chief food plants from Asia and America. This has been especially true in the rain forest areas, for practically none of the jungle food crops is native to Africa. (Crosby 1972, p.185)

Similarly, Klein (2004, pp.223-226) recently concluded that “new American foods imported by Europeans for their own needs were soon cultivated by African producers. These imports included such fundamental crops as maize and sweet potatoes, along with manioc (cassava), coffee, and cacao...The Europeans also introduced pigs and such unfamiliar Asian products as citrus fruits. Many of these crops slowly replaced or supplemented traditional African foodstuffs, often permitting denser and healthier populations.”

The fundamental impact of American plants on African agriculture is an ironic development because many millions of Africans – nourished by New World crops both within Africa and in America – were subsequently shipped in chains across the Atlantic as laborers who ‘substituted’ for the tens of millions of missing indigenous American laborers eradicated by Old World diseases against which indigenous Americans lacked immunity. Vast non-human resources awaited exploitation in the Americas, in other words, but epidemiological decimation of the indigenous American labor supply necessitated importation of laborers from the Old World: “With an excellent supply of precious metals,...the Spaniards of America could afford to experiment with the importation of African slaves to fill in the regions abandoned by Amerindian laborers” (Klein 2004, p.204) We assert that these sorts of global epidemiological, ecological and demographic forces – all interrelated because of new transoceanic linkages – were crucial to the tens of millions of indigenous Americans and African slaves directly impacted because of reconnection of the Old World and the New World. Blacks soon came to outnumber whites in the New World. Indeed, Africans played a key role in the consolidation of Spanish power in the Americas:

Blacks were with Balboa when he claimed the Pacific, with Pedrarias Dávila when he colonized Panama, with Cortés when he marched to Tenochtitlan, with Alvarado when he entered Guatemala. Almagro apparently had twice as many blacks as Spaniards serving with him, and Gonzalo Pizarro at the time of his rebellion had up to 400 blacks in his forces...Blacks became the main component of the militias that fought the Indians, patrolled the frontiers, put down rebellions and fought foreign pirates...The principal role of Black Africans in the Spanish Empire was as mainstay of the economy...In no small measure, the black man created the empire that Spain directed in the New World. (Kamen 2003, pp.139, 141)

Thus, we agree completely with the insistence that – in order to be considered truly global – linkages must have “really mattered to the economic lives of the vast majority.” (O’Rourke & Williamson, 2002, p.28) They maintain that what “really mattered” was convergence of certain prices during the nineteenth century; on the other hand, we emphasize geo-economic connections that led to fundamental (and unintended) global transformations – beginning in the 16th century and studied via numerous historical disciplines – that continue to influence multiple facets of human experience today.

3. Underlying Concepts of Supply and Demand

Some two decades ago, Flynn (1986) concluded that the early-modern global history of silver could not be properly understood through application of conventional monetary theory. For one thing, silver flowed from European to Asian markets throughout the period 1540s-1640, while gold simultaneously counter-flowed from Asian to European markets during the same period; this silver-against-gold exchange pattern recurred across EurAsia during the period 1700-1750. That is, the monetary substance gold was persistently exchanged for the monetary substance silver for generations. Since conventional monetary theory requires aggregation of various monetary substances into a category called ‘money’, conventional monetary aggregation impedes understanding of why *specific* monetary substances flowed to *individualized locations* (often exchanged against other monetary substances). Indeed, none of the world’s four major monies – silver, gold, copper, and cowries – *ever* traveled in tandem together as ‘money’ throughout the 16th, 17th, and 18th centuries. Each substance was produced in specific areas, enjoyed distinct end markets, and followed individual trade paths between production sites and end markets. Supply and demand conditions for each monetary substance must be studied independently.¹⁸

Another weakness of modern monetary theory is that it offers no guidance for determining optimal rates of silver or gold production: Monetary theory generally views increases/decreases in money supplies as exogenous policy decisions, rather than as endogenous resultants of supply and demand forces that determine quantities and prices of specific monetary substances. Modern monetary theory posits the interest rate as the ‘rental price’ of money. Yet, we contend that (excess) economic profits fell to zero for silver mines in long-run equilibrium. It makes no sense to say that ‘the interest rate’ (the rental price of money) eventually falls to silver’s cost of production, of course, so we are forced to conceptualize silver via supply-demand modeling that expresses the price of silver in the same manner as the price of any non-monetary commodity. Individual commodity monies were produced for profit, as were non-monetary commodities. Prices and quantities of each monetary substance must be explained separately, and not lumped together. In response to these difficulties, Doherty and Flynn (1989) developed a utility-maximization model that simultaneously yields three interrelated demand functions:

¹⁸ For a sketch of the global history of the world’s four main monies, see Flynn and Giráldez (1997).

purchase demand, consumption demand, and inventory demand.¹⁹ These three demand functions are derived together as a package in this model, but it is the inventory demand concept that has especially guided our subsequent study of the history of world silver markets.

It turns out that Spanish American and Japanese silver did not flow to ‘Asia’ at all, but instead flowed specifically to China as the principle end-market. The price of silver in China had risen to double that of the rest of the world because China’s paper-money system had collapsed previously; in addition, China’s fiscal system was gravitating toward a silver foundation along with its monetary system. This ‘silverization’ of China has been documented by Richard von Glahn (1996a; 1996b). Europeans entered into the Asian marketplace in force since the 16th century because they finally had access to a product – namely, Spanish-American silver – with which to purchase manufactured items such as Chinese silks, Chinese ceramics, and Indian cottons. Europeans were also intermediaries in exchanging Japanese silver for silk imports from China.²⁰ And the Acapulco-Manila galleons provided Spain’s only direct access to the Chinese marketplace via the Pacific Ocean. Merchants from throughout the world – Asian as much as European – profited mightily in the global trade that brought silver to China (and to India, to a lesser extent). But the crucial point to keep in mind is that the very same galleons that carried silver out of the Americas simultaneously carried American plants of epic historical significance. Even though the market value of American plants transported via maritime routes may appear insignificant – that is, ‘insignificant’ to those who study trade history in isolation from other disciplinary histories – dissemination of American plants to foreign soil, in fact, led to demographic revolutions worldwide. A fundamental difference between our work and that of O’Rourke and Williamson is that we perceive trade history as inextricably interlinked with ecological history, epidemiological history, demographic history, and cultural history. They ignore these interdisciplinary linkages. It is recognition of fundamental planetary linkages that led Alfred Crosby (1986, p.271) to describe the post-15th-century global exchange of flora, fauna and diseases as “a revolution more extreme than any seen on this planet since the extinction at the end of the Pleistocene.” We maintain that Crosby is correct and we attempt to tie trade history to the line of work that he pioneered.

Our research concentrates on impacts within China, the world’s largest economy throughout the early-modern period, because American plants contributed to at least a

¹⁹ The difficulty is that monies are inherently inventory-stock entities, and conventional microeconomic supply and demand functions refer to time-dimensioned flows only. For basic derivation of simultaneous stock and flow demand functions, see Doherty and Flynn (1989) [it is unfortunate that ‘a microeconomic quantity theory of money’ appears in the title of this article, since we later realized that the model generates a “price theory of money” rather than “a quantity theory of money”].

²⁰ See Souza (2004 [paper] [1986 hardback], Chapter 4, pp.46-86) for discussion of Portuguese intermediation between China and Japan, as well as between China (Canton market) and the Philippines (and thus the New World) in the late 16th and first half of the 17th centuries.

doubling of the Chinese landmass – and an even greater increase in Chinese population – during the 18th century.²¹ Dramatic demand-side pressures within China – already ‘silverized’ by the 16th century – raised the price of silver within China 50% above that of the rest of the world by 1700. The immense “Mexican Silver Cycle” boom of 1700-1750, which stimulated trade routes worldwide in a sort of ‘echo effect’, is attributable in large part to demand-side pressures emanating from China.²² All told, Spanish America produced over 150,000 tons of silver throughout the 16th-18th centuries, much of which was destined for the Chinese marketplace. But our argument for a 16th-century birth of globalization does *not* rest on the *size* of the silver trade (albeit the world’s dominant trade item). Since the 16th century, trade developments have been tied to ecological developments – as well as epidemiological, and demographic, and cultural developments – in a manner that influenced virtually everyone throughout the globe.²³ We contend that an interdisciplinary approach is required in order to identify globalization’s origin. Scholars must inevitably specialize in their historical studies, of course, but our point is that specialized scholarship gains significance when placed within a broad multi-disciplinary vision of globalization history. And our multi-century narrative is modest indeed compared with the ‘Big History’ approaches of David Christian and Fred Spier, scholars who consider human history itself as a stage in a multi-billion-year continuum that stretches back to the big bang origins of our universe. Yet in terms of globalization history, Christian (2004, pp.364-365) argues that:

The creation of a truly global exchange network in the sixteenth century decisively increased the scale, significance, and variety of informational and commercial exchanges. The coming together of the different world

²¹ We do not possess expertise for critical evaluation of Deng’s (2004) drastically-reduced recent estimates of Chinese population. The low numbers of Kent Deng, however, imply even higher-than-normal Chinese *population growth rates* during the 18th century. Also, note our specific reference to American crops as one source of population growth within 18th-century China. Some scholars emphasize internal developments within China – increased agricultural production due to double-cropping, for example (Goldstone 2004; who cites Li 1998). We do not know whether internal or external factors were the most important factors in generating population growth within China. Moreover, we do not want to leave the impression that China was disproportionately impacted by diffusion of American crops. The impact was global.

²² For documentation of overall European shipment of American silver via the Cape Route between 1497 and 1795, see deVries (2003). Acknowledging that the Cape Route trade represented a relatively small fraction of European shipping overall, deVries (2003, p.72, 82) nonetheless concludes that "Two million men set sail, but it is doubtful that as many as half of them ever returned to Europe," and that "To secure that pound of Asian commodities per European consumer then required six or seven thousand European lives and about 150 tons of silver each year."

²³ For an account of dramatic regional specialization of production within China (an economy as large or larger than all of Europe) as a result of global interconnections, see Marks (1997;1999; 2007).

zones of the Holocene era marks a revolutionary moment in the history of humanity....And the new level of creative synergy generated by linking the two largest world zones – Afro-Eurasia and the Americas – was and remains perhaps the most powerful single level of change in the modern world.

Spier (2003, p.118) also refers to revolutionary changes during the sixteenth century as:

...an increasing integration of humans all around the globe into one single, ever more complex network of interdependencies. People, produce, plants, some animals, natural resources and infectious diseases were increasingly spread all around the world. This included the colonization of the Americas, while American silver was transported to China traveling both East and West.

Spier (2003, p.119) calls attention to world maps and icons produced in late-16th century Amsterdam, visual aids that demonstrated and promoted geographical awareness of the globe as a conceptual totality:²⁴

This first wave of true globalization also led to what I would call the first *Earth icons*: images of our planet used by people to show that they were global players. On many contemporary maps and in a number of books dealing with global aspects one can find such allegorical pictures, depicting, for instance, the maiden of Amsterdam holding up high a globe, while people from around the world are displaying their wealth at her feet. During one of my icon hunting expeditions in Amsterdam, I even found a gable stone dating back to 1639 C.E. displaying the Earth. All of this points to a vivid global awareness in this city at that time.

Nor was this 16th-17th century global awareness confined to Europe, as is made clear by Yonemoto (1999, pp.176-177):²⁵

When Portuguese traders and missionaries first brought world maps and globes to Japan in the late sixteenth century, Oda Nobunaga (1534-1582), Toyotomi Hideyoshi (1536-1598), and other Japanese rulers were much taken with the impressive vision they afforded of global space.... In this global vision, the Japanese archipelago was a relatively minor presence, hovering on the ocean's western edge.

²⁴ Spier is aware that globes and global atlases did not originate in Holland. A good overview of this topic can be found in Chapter 5 of Gunn (2003, p.120), which describes a shift in the center of globe making and world mapmaking from the Iberian Peninsula to the Low Countries around 1570.

²⁵ For a fascinating treatment of Japanese-Korean-Chinese economic and political connections via ginseng and silver, see the recent Ph.D. dissertation by Kim (2006), as well as an article derived therefrom (Kim, forthcoming).

Yet in spite of this clearly marginal status in the Pacific world, the Japanese in the early modern period refined cartographic strategies for comprehending ocean space not by conquering it but by dividing it. Borrowing from a hybrid Chinese-European cartographic model, world maps produced in Japan from the sixteenth century onward tend to depict the Pacific as two oceans, a ‘Small Eastern Sea’, which comprised the portion of the Pacific closest to Asia and the Japanese archipelago, and a ‘Large Eastern Sea’, which bordered the North American continent... The division of the Pacific into the Small and Large Eastern Seas derived from a four-ocean, six-continent scheme of world geography devised by Matteo Ricci (1552-1619)... copies and adaptations of which were brought to Japan soon after their production in China... Ricci’s maps exerted a strong influence on Chinese and subsequently Japanese cartographic visions of the world. By 1645, Japanese printmakers in Nagasaki were making maps based on Ricci’s; these ‘maps of myriad countries’, were often accompanied by depictions of ‘the world’s people’, usually as male-female pairs dressed in some culturally distinctive clothing.

We have criticized the O’Rourke and Williamson model for insisting that Europe-in-general was a net demander of Asian and American goods, while Asia and the Americas were simultaneously overall net suppliers of internationally-traded goods. Our objection is based upon the observation that each general region swapped its exports against similarly-valued imports from other regions. There was no ‘trade imbalance’ because each region was simultaneously both a supplier (e.g. Chinese silk and ceramic exports) and a demander (e.g. Chinese and Indian imports of silver) of internationally-traded goods; in today’s parlance, there was no imbalance in the current account because there was no capital account imbalance. Goods were merely swapped for goods. Thus, we argue that one should portray regions as neither net demanders nor net suppliers during the early-modern era. In response to our contention that there were no trade surpluses/deficits at the continental level during the early-modern period, O’Rourke and Williamson (2004, p. 112) claim that “Flynn and Giráldez have misinterpreted us here” since “we are talking about *net* export supply and *net* import demand, not simply supply and demand.” But it is O’Rourke and Williamson who have apparently misinterpreted our objection. Their *net* export supply and *net* import demand concepts were in fact clear to us from the start. Regions are frequently *net* export suppliers or *net* import demanders of all sorts of *specific* items, including those specified by O’Rourke and Williamson. This is not a point of contention. Our objection is that neither Asia nor the Americas should be portrayed as *net* export suppliers *overall*; similarly, Europe should not be portrayed as a *net* import demander *overall*. Our logic is straightforward. China exported massive quantities of manufactured goods in exchange for imports of silver. China was equally import demander and export supplier; there was no identifiable capital account imbalance, so there could have been no current account imbalance either. Goods were swapped for goods, irrespective of whether some of those goods were monetary substances. In sum, we do not object to *net* export supply and *net* import demand concepts as applied to individual commodities. Our separable contention is that authors should not give the impression that entire regions or land masses (continents, if you must) can be portrayed

in *net* import or *net* export terms overall. Europe-as-a-whole was not a 'net demander' in the sense that the United States runs huge current account deficits today, and 'Asia' and the 'Americas' were not 'net suppliers' in the sense of trade surplus countries today. We know that huge regions were neither 'net demanders' nor 'net suppliers' because there is no evidence of massive inter-regional loans upon which the trade was based. Things were swapped for things.

As for dynamics that generated the birth of 16th-century globalization, Spanish America and Japan dominated silver's supply side and the Chinese marketplace dominated on the demand side. Europeans were crucial intermediaries, but not prime movers. Henry Kamen's characterization of the late-16th-century Spanish Empire can be applied to the role of numerous Europeans:

For the first time in history, an international empire integrated the markets of the world, as vessels from the St. Lawrence, the Rio de la Plata, from Nagasaki, Macao, Manila, Acapulco, Callao, Veracruz, Havana, Antwerp, Genoa and Seville criss-crossed in an interminable commercial chain that exchanged commodities and profits, enriched merchants, and globalized civilization. African slaves went to Mexico, Mexican silver to China, Chinese silks to Madrid....throughout the great age of trade the [Iberian] peninsula functioned neither as exporter nor as importer but merely as an entrepôt. (Kamen 2003, p.296)

In sum, O'Rourke and Williamson focus on European demand dynamics, while we call attention to supply and demand dynamics emanating from Asia, the Americas, and Europe as well. In this sense too, there is sharp divergence of general visions.

How does the discussion immediately above relate to our three demand concepts – purchase demand, consumption demand, and inventory demand – mentioned earlier in this section? In terms of China as the world's dominant end-market for silver, the concept 'consumption demand' does not apply.²⁶ This leaves purchase demand and inventory demand. After collapse of its paper money system during the mid-15th century, China experienced a protracted process of what Richard von Glahn (1996a; 1996b) terms the 'silverization' of China. The role of China as *bomba-aspirante* (suction pump) for world silver, and particularly for attracting the Mexican *pesos de a ocho reales*, had been recognized for centuries prior to Boxer's (1970) classic article.

²⁶ Since inventory-stock demand and supply concepts play a central role in our utility-maximization model, it is necessary to define 'consumption' more narrowly than in conventional microeconomic analysis. In order to qualify as 'consumption' in the Doherty-Flynn (1989) model, the activity must both generate utility *and reduce inventory holdings*. Since holding silver stocks does not reduce silver inventories, there is no 'consumption demand' for silver. There is a decay rate for silver holdings (i.e. even durable goods erode), but this is a separate issue that does not involve generation of utility.

Imagine a giant swimming pool as hydraulic metaphor representing China's stock demand for silver. The water level is much lower in China (i.e. the value of silver is higher) than in the rest of the world because the capacity of the Chinese pool (its stock demand for silver) is much greater than the amount of water actually inside the pool initially (the initial stock supply of silver in China). Once pools are connected to each other (transoceanic barriers are transformed into transoceanic freeways), water (silver) naturally flows (net export/sales supply from Spanish America and Japan; net import/purchase demand from the Chinese point of view) from high-water-level pools to low-water-level pools (i.e. arbitrage-trade occurs). Depending upon the extent to which each pool is filled relative to its capacity (stock supply relative to stock demand for silver, by region), the water levels initially differ (price of silver in China is higher than elsewhere). The volume of water flowing from high-water pools (low-silver-price regions) to low-water pools (high-silver price regions, especially China) depends upon relative pool pressures and the size/strength of connecting pipes (ocean and land trade routes). Depending upon the strength of all these factors, it could take quite some time for all connected pools to settle at a common water level (global equilibrium in the silver market). During the first Potosí-Japan cycle of silver, it took a full century (from the 1540s to 1640) of silver production and shipments in order to bring China's 'pool level' up to that of the rest of the world; that is, the price of silver in China declined to the world price by 1640. Silver continued to flow into China after silver-price convergence in 1640 (i.e. after arbitrage had been eliminated) for two reasons: one, a small percentage of the silver wore out or was lost (water evaporation requires replacement); and two, there was an immense rise in Chinese demand for silver after American plants precipitated a population explosion during the 18th century (China's pool enlarged considerably). The second 'Mexican Silver Cycle' lasted from 1700 to 1750, and a similar swimming-pool metaphor could be provided again (with global silver-price equilibrium reached in a half century this time, by 1750). The upshot is that interactive ecological, demographic, and economic forces playing out over several centuries. Inventory-demand concepts provide a mechanism through which to conceptualize complex, multidisciplinary processes operating at a global level. In the absence of powerful demand-side forces emanating from within Asia, the 16th-century birth of globalization could not have proceeded along its path outlined above. In terms of our disagreement with O'Rourke and Williamson, we simply cannot accept their depiction of Asia or America in export-supply terms alone, any more than we can accept depiction of Europe in import-demand terms alone. Our inventory demand and inventory supply concepts suggest a dramatically different perspective, one which emphasizes powerful – but not exclusive – demand-side forces emanating from Asia. But Asian demand-side forces could only be realized through massive manufacturing activity on the Asian supply side simultaneously. Pomeranz (2000, p. 191) places this global-regional trade in proper perspective:

My point here is not to assign a unique motivating force to European fashion and luxury demand, which, though *perhaps* quantitatively greater per capita than in China or Japan, was not unique in kind. Rather, I would emphasize that this demand mattered only in conjunction with the New World silver itself, the productive capacity of Asian proto-industries, and

the unprecedented demand in those economies for huge imports of an item of daily use (silver). But surely the growth of European demand – both in its familiar and unusual features – needs to be part of the story, even for silver-dependent, and thus China-dependent, New Spain.

Again, the issue is not (non-European) supply versus (European) demand, but rather interactive-regional supply *and* demand factors throughout the world. In the absence of inventory demand and supply concepts, interactive global trade history lacks theoretical coherence.

Imagine a commonplace activity such as a Londoner drinking a cup of tea during the 18th century. Her/his tea, cup, and saucer were produced in China. Unlike the unsweetened tea drink of China, British tea was sweetened with sugar imported from the West Indies or Brazil. New World sugar – produced by slave labor from Africa – was a significant source of calories for citizens of England. But one-third of the market value of the 20,000 slaves exported from Africa in the early 18th century were purchased with cowry money alone imported into West Africa.²⁷ And cotton goods imported into West Africa during the 17th century were worth perhaps one-half of the market value of African slave exports (Klein 2004, p.218) Europeans obtained the cowry shells from the Maldiv Islands in the Indian Ocean and the cotton goods from India; both products were obtained in exchange for American silver. Europeans then swapped Asian cowries and cottons for African slaves (in a system of transactions far more complex than suggested in this sketch). And the London imbiber of tea likely wore cotton clothing from India and was surrounded by Chinese articles symptomatic of the *chinoiserie* craze sweeping Europe at that time. By itself, the pedestrian act of drinking a cup of tea in Europe during the 18th century – a century prior to the 1820s price convergence emphasized by O'Rourke and Williamson – illustrates deep-seated connections that had long engulfed all of the world's heavily-populated land masses.²⁸

4. Early globalization and the Industrial Revolution

Research in global history today follows two routes: comparisons or connections. Two or more regions of the world can be compared, either at a point in time or over time. Alternatively, global connections can be studied – usually through a specific item or topic – again, either at a point in time or over time. Ken Pomeranz's *Great Divergence* (2000), a comparative history of various regions across the Eurasian landmass at the time of the

²⁷ By 1720, Europeans were importing and re-exporting around a million pounds weight in cowries per year, equal to approximately one-third of the value of the 20,000 African slaves exported annually at that time. (Johnson, 1970, p.21). See Flynn and Giráldez (1997) for discussion of cowries and other world monies in a global setting.

²⁸ At Osaka University and University of Tokyo lectures in February 2005, some in the audience criticized our London tea drinking example because it focuses excessively on a European point of view. This objection is valid, but our intent here is to argue against Eurocentric reasoning by way of Eurocentric examples.

Industrial Revolution, is a landmark contribution to global history.²⁹ His comparative work – explicitly placed in a global-connections setting – is generally consistent with ours in that pre-Industrial Revolution China is portrayed as a dominant economic power and the role of ecological history is central. He argues that resource exhaustion by 1800 implied ecological bottlenecks for all advanced regions throughout the world’s largest landmass, i.e. across Eurasia. Certain regions of Northwest Europe (initially England in particular) managed to escape ecological “cul-de-sacs”, in the words of Pomeranz, because they gained access to vast resources of the New World. Specifically, Pomeranz argues that it would have been impossible for England to generate sufficient ‘ghost acres’ of domestic grain production in order to replace the calories obtained via sugar and other resource-intensive items imported from the Americas. The overall Pomeranz hypothesis is consistent with our general narrative outlined above, but our work suggest modification of one conclusion.

All advanced regions of the Eurasian landmass faced ecological cul-de-sacs, according to Pomeranz, because of resource exhaustion. Select regions within Europe were able to escape specific ecological cul-de-sacs because of access to vast resources from the New World. Since advanced regions throughout Asia lacked access to New World resources, Pomeranz reasons that no ecological escape valve – that is, none parallel to the European case – was available to any Asian society. But our research calls this contention into question. Asian powers in general, and China in particular, did gain access to immense quantities of American resources, resources that generated staggering quantities of hitherto unavailable calories. These calories were home-grown on Asian soil, rather than obtained through intercontinental shipment – as was the case for Britain – but the calories were of American origin nonetheless. The new American crops “created land” in the sense that previously unproductive lands became arable and suitable for cultivation; the doubling of China’s landmass during the 18th century, for example, is attributable to American crops.³⁰ We know of no attempt to estimate the quantity of calories yielded by American crops (or the number of hectares of new land brought into cultivation) while sustaining many tens of millions of Chinese who migrated and reproduced in previously inhospitable regions of north and west China. The entire population of England is estimated at a mere 8.7 million around 1800, however, so *additional* calories from American crops grown inside of China must have been many times greater than England’s *total* caloric consumption (whether imported from the Americas or

²⁹ The work of Souza (2005) complements Pomeranz in showing how global maritime commodity history helps explain the great convergence (catching up) of European production with that of Asia, preceding the Industrial Revolution divergence that is the focus of Pomeranz.

³⁰ The importance of American crops for Chinese agriculture is widely acknowledged in, for example, Ping-Ti Ho (1959, p.268), and Nanquin and Rawski (1987, p.23). See Mazumdar (1999) for an insightful contrast between introduction of New World crops into China versus India. Spence (1990, p.95) says that “because the crops grew well in poor, hilly or sandy soil, they enabled the population to rise rapidly in areas of otherwise marginal productivity, where alternate sources of food or gainful employment were rare.”

domestically generated).³¹ Of course, it might be argued that access to American resources led to the release of agricultural workers for industrial purposes in England, whereas American calories merely led to expansion of peasant agricultural in China. That is, access to American calories – whether via imports or home-grown – may have yielded divergent outcomes in distinct settings. Our point is simply that Africans, Asians and Europeans all gained access to resources from the Americas. Discovery of how and why access to American resources was associated with such distinct outcomes in recipient regions seems to us an important research agenda.³² Many key linkages to American resources remain unclear to us at this time, but we contend that improved understanding is most likely to emerge with the help of globally-oriented theoretical constructs that acknowledge interdisciplinary interconnections.

5. *Summary and Conclusion*

While the [historiographical] strategy of going local effectively undermines some of the assumptions of Eurocentric history, the strategy of going global by historicizing globalization offers opportunities to decenter Europe by situating European experience in the larger context of world history.... At its worst, world history has served ideological functions by constructing visions of the global past in which Europe and its outposts figure as sites of dynamism and progress, while other regions become little more than sinks of stagnation and regression. (Bentley, 2006, p. 27)

According to O'Rourke and Williamson (2004, p.109): “We argue that *globalization has evolved since Columbus* [emphasis added], but that the most dramatic change by far took place in the nineteenth century...Globalization became economically meaningful only with the dawn of the nineteenth century, and it came on in a rush.” Our response is twofold: (a) nineteenth-century price convergence was indeed important, yet (b) 19th-century price convergence depended upon reconnection of the Americas to the Old World from the 16th century onwards. Connection of the Americas to the rest of the world – after more than ten thousand years of isolation because of rising oceans since the end of the last Ice Age – yielded ecological and social transformations so profound that Alfred Crosby (1986, p.271) depicts the post-fifteenth-century exchange of flora, fauna and diseases as “a revolution more extreme than any seen on this planet since the extinction at

³¹ For England's population in 1800, see de Vries (1994, p. 13). Lee and Schofield (1981, p.21) estimate a population of 9.16 million for England and Wales for 1801. In a comparative analysis of the Industrial Revolution, Peer Vries (2003, p.1) states that China was some 30 times larger than Britain in 1700 and in 1850.

³² For periodization of European vis-à-vis East Asian economic performance and interactions since the 16th century, including discussion of differential resource bases, see Sugihara (2003; 2004).

the end of the Pleistocene.” Worldwide reconnection of the Americas with the rest of the world marked the birth of globalization – an epochal sea-change in economic, epidemiological, ecological, demographic, and cultural history. Nineteenth-century price convergences occurred during later phases of the globalization process. Allow an analogy: one might argue that a college education is of primary importance in an individual’s life, but no one would therefore conclude that college graduation marks that person’s birth date. Similarly, our insistence that globalization was born during the sixteenth century does not diminish the significance of events surrounding the Industrial Revolution (including price convergence).

O’Rourke and Williamson portray globalization to have resulted from unfettered free trade, as indicated in the following passage:

Since we have not been able to find any significant evidence of commodity price convergence but plenty of evidence confirming its absence, it follows that Euro-Asian and Euro-American trade must have boomed after 1492 *in spite of* barriers to trade and anti-global mercantilist sentiment. There would have been a bigger trade boom without them. We stress that *Flynn and Giráldez have not challenged this evidence or this inference from it.* (O’Rourke and Williamson 2004, p.111)

But our argument contradicts this statement. It is not clear what is meant by the phrase ‘mercantilist sentiment’, but it is historical fact that various European entities – the Spanish imperial enterprise, the Portuguese *Estado da India*, the Dutch VOC, the English East India Company, and others – monopolized as much of global trade as they could (that is, they established barriers) in order to generate profits for select groups. One may term this behavior mercantilism or ‘mercantilist sentiment’ if you wish, but the linkages created by these very mercantile enterprises constituted the birth of globalization (and shaped its later evolution). Control of –or at least access to – key ports throughout world was a prerequisite of global trade. Global maritime activity required the direct involvement of governments and government-sponsored enterprises, so we flatly reject the conclusion by O’Rourke and Williamson that there “would have been a bigger trade boom without them.” Globalization’s birth went hand in hand with mercantile controls. The issue is not mercantilism versus global trade, but mercantile power as a prerequisite for global interaction. Moreover, O’Rourke and Williamson provide no explanation for why trade boomed after 1492; they speculate instead about mercantile factors that allegedly restricted this initial boom, but the boom itself lacks an explanation. In contrast, we explain the source of the initial global boom. Silver – by far the dominant trade item in the early-modern world – was exchanged for Chinese and Indian exports. O’Rourke and Williamson openly admit that the silver trade is ignored in their analysis, yet we are adamant that the birth of globalization makes no sense in absence of the silver trade:

There is general agreement that American silver made possible European trade with Asia well into the 1700s. It was not that the European economy itself was more productive or sophisticated than that of Mughal India or Ming and Manchu

(Qing) China; it was simply that Europeans could now provide something that sold very profitably in Asian markets. (Ringrose 2001, p.195)

And it bears repeating that silver prices did indeed converge globally around 1640 and a second time around 1750. It is inaccurate to state that price convergence did not appear until the 1820s.³³ O'Rourke and Williamson have yet to respond to our contention that global prices for silver – the globe's dominant trade item – converged not once, but twice prior to the 1820s.

While our work has focused mainly on economic history, decades of research on the production and flows of monetary substances – especially silver, but also gold, copper, and cowry shells – has forced us to adopt global views deeply influenced by geographic considerations. A passage from Martin Lewis (2000, p.605) is worthy of lengthy citation:

There is much to commend in the interdisciplinary emergence of globalization studies. Literary scholars explore global themes and genres in novels, plays, poetry, and films (Jameson and Miyoshi 1998); cultural anthropologists demonstrate how even the most seemingly isolated peoples are often fully implicated in global cultural and economic systems (Piot 1999); historians (and historical economists) trace and exhume the roots of globalization in surprisingly deep strata (Frank and Gills 1993; O'Rourke and Williamson 1999); sociologists and economists map, in detail, the commodity chains that link producers with consumers and service providers across vast reaches, ultimately showing how a new global 'network society' is emerging (Gereffi and Korzeniewicz 1994; Castells 1996; Sassen 1998); scholars in business schools outline what global corporate strategies actually entail and, in the process, show the importance of places – notably India (Garten 2000b) – that have been unduly marginalized in the social literature. In globalization symposia across the country, exciting interdisciplinary efforts are being forged that can, at best, speak across the sometimes seemingly unbridgeable divides separating disciplines and interpretive communities.

The voice of academic geography, however, has remained muted in globalization discussions.

What could be more central to geography than the globe and global interconnectedness? Globalization history must exclude no discipline, least of all geography. Firmly rooted in geography, our definition of globalization permits identification of its birth in a manner that excludes neither academic disciplines nor geographical regions (in contrast, O'Rourke and Williamson ignore crucial connections across the Pacific Ocean and fail to

³³ Indeed, the jury is still out on whether non-silver prices did or did not converge prior to the 1820s. Souza (2006b), for example, has begun to compile 110 years of VOC price data during the 18th century, and plans to publish a book on this topic within a few years.

integrate Africa into their global narrative).³⁴ The O'Rourke and Williamson definition of globalization excludes non-economic topics that we find crucial. Such exclusions encourage further isolation of economic historians from historically-minded scholars in other disciplines. On the rare occasion where O'Rourke and Williamson did address our claims relative to the global spread of flora, fauna, and diseases, they missed the central geographical aspect of our definition of globalization:

But until it can be shown that the magnitude of these transfers [of flora, fauna, and diseases] rises simultaneously with the magnitude of the trade...such transfers and their impact can hardly be assigned to commodity market integration. To offer just one counter-example, the impact of the plague on fourteenth-century Europe was bigger than the impact of HIV-AIDS on twenty-first century Africa, yet the former was hardly integrated into the world economy. (O'Rourke and Williamson 2004, p.114)

This statement misses our point because the Black Death of pre-Columbian times, no matter how significant, spread across an AfroEurAsian landmass that comprised no more than one-third of the surface area of the earth (including the Indian Ocean). Globalization could not begin until the AfroEurAsian Old World – disconnected from the other two-thirds of the surface area of the earth for over ten thousand years – became reconnected via maritime connections from the 16th century onward. The Black Death occurred prior to modern globalization, in other words, while the HIV-AIDS epidemic continues to be transmitted through global interconnections. Whether the 14th-century plague killed a larger or smaller percentage of world population than 20th-century AIDS is not germane to debate concerning globalization's start date. As stated in the body of this essay, the entire planet was transformed when all three one-thirds of the globe became reconnected – the Old World, the New World (including the Atlantic Ocean), and the Pacific World -- since the 16th century. And again, the fact that many of the complex global interconnections discussed in this essay are not amenable to statistical analysis is irrelevant. Impacts that continue to reverberate throughout the planet were immense, complex, and can no longer be ignored. Moreover, the O'Rourke and Williamson quote cited immediately above illustrates failure to recognize significant time-lags involved in connecting ecological transfers with economic trade: "until it can be shown that the magnitude of these transfers [of flora, fauna, and diseases] rises *simultaneously* with the magnitude of the trade" [italics added] then globalization has not yet appeared. But the globalization process involved many non-simultaneous processes. For example, three crucial American plants – maize, the sweet potato, and peanut – were introduced into China during the 16th century, yet their most significant ecological/demographic impact occurred in the 18th century. Ecological time lags were quite distinct in Chinese, Indian, and African settings (among others), yet path-dependent processes were set in motion in each case.

³⁴ For early-modern ecological transfers across the Pacific Ocean, see Gerber and Lei Guang (2006).

Research in economic history requires specialization, like any other discipline, but specialized researchers benefit when specific subject matter can be placed within a disciplinary context, as well as within the broad scope of historical scholarship generally. Overarching narratives, including the birth of globalization, are by nature interdisciplinary. We believe that economic history would enhance its role within the history profession and academia generally, if economic history research were explicitly positioned within the context of broad narratives that are interdisciplinary by nature. Globalization history beckons economic history as a team player, but not as the entire game.

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