
The Capitalist World-economy in the *Longue Durée*

Changing Modes of the Global Distribution of Wealth, 1500–2008

ABSTRACT This article examines the global distribution of wealth within the capitalist world-economy over the *longue durée*. In stark contrast to the convergence of wealth predicted by modernization theory, the relatively stable bimodal (core-periphery) structure predicted by dependency theory, and the relatively stable trimodal (core-semiperiphery-periphery) structure, this article finds that the structure of the distribution of wealth in the world economy has transformed with each successive world hegemonic cycle. By adopting a *longue durée* perspective and a new statistical approach, I develop Arrighi and Drangel's (1986) method of conceptualizing, operationalizing, and measuring the global distribution of wealth within the capitalist world-economy. Through an examination of the period from 1500 to 2008, this article shows that the global distribution of wealth within the capitalist world-economy has transformed from a unimodal distribution during the period of Dutch hegemony to a bimodal distribution during the period of British hegemony, then to a trimodal distribution during the period of US hegemony, and now to a quadrimodal distribution in the early twenty-first century. While the global wealth hierarchy remained stable during periods of world hegemonies, it was transformed during periods of systemic crisis and hegemonic transition, thereby creating new forms of hierarchies. **KEYWORDS** capitalist world-economy, global inequality, modernization theory, dependency theory, world-systems theory, core-periphery structure

INTRODUCTION

There has been an intense scholarly debate over the extent to which globalization of the capitalist world-economy has affected wealth equality, and also whether this effect has resulted in greater equality or inequality (Arrighi, Silver, and Brewer 2003; Firebaugh 2000; Hung and Kucinskas 2011; Korzeniewicz and Moran 1997; Piketty 2014; Sala-i-Martin 2006; Wade 2004). Many of the early debates positioned modernization theory against dependency and world-systems theories, each of which predicted the emergence of a distinct global distribution of wealth. In the 1950s and early 1960s, modernization theories predicted that noncapitalist “traditional societies” would soon catch up with the standards of wealth established by advanced capitalist countries because of the diffusion of industrialization, capitalism, and modernization processes (Rostow 1960). Modernization theorists expected that the global distribution of wealth would gradually converge and form a unimodal structure. In contrast, dependency theorists predicted that the polarizing tendencies of capitalism would lead each state in the capitalist world-economy to become either a privileged, developed

center (i.e., core) or an exploited, underdeveloped periphery (Amin 1974; Cardoso and Faletto 1979; Frank 1967). Thus, according to dependency theorists, the capitalist world-economy has been characterized by a bimodal distribution of wealth with a stable core-periphery differentiation.

In the 1970s, the world-systems perspective emerged as a double critique of modernization and dependency theories. Against modernization theories, world-systems scholars maintained that in the entire history of the capitalist world-economy the gap between the top and the bottom of the world division of labor (that is, between core and the peripheral regions) has not decreased; rather, it has always increased (Wallerstein 2005). Against dependency theories, they insisted that there has always been a third cluster (the semiperiphery) permanently stationed in an intermediate position (Arrighi and Drangel 1986; Wallerstein 1979:60–82). According to many world-systems scholars, these semiperipheral locations—which combine with the core and periphery to create a trimodal structure—have remained an integral part of the capitalist world-economy since its emergence in the sixteenth century (Hopkins and Wallerstein 1977; Wallerstein 1974, 1979, 2004). The semiperiphery has played a critical function in the continuation, stabilization, and legitimization of the capitalist world-system (Chase-Dunn and Rubinson 1977; Wallerstein 1974:349–50; 1979:68–69).

Since the turn of the twenty-first century, these debates have resurfaced in the literature. There is growing awareness that the rise of a cluster of countries from the global South—including countries that account for a significant percentage of total world population such as China and India—seems to be altering the existing global stratification of wealth (Palat 2012). Yet the existing literature on international development contains contradictory interpretations of these ongoing changes in light of dominant paradigms. Jeffrey Alexander (1995), for instance, argues that the demise of socialism and the rise of East Asia challenged the credibility of the dependency and world-systems approaches and created the conditions for the popularization of the modernization paradigm once again. Many scholars today see the rise of East Asia and the global South as evidence of global convergence as predicted by modernization theory (Sala-i-Martin 2006). In line with emerging neomodernization theories, Milanovic (2013) also argues that for the first time since the Industrial Revolution global inequality trends have started to reverse in the twenty-first century (also see Hung and Kucinkas 2011). Parallel to this sudden “revival of modernization theory,” a variant of dependency theory is also coming back, mostly because of the blurring demarcation lines between the peripheral and the semiperipheral zones as a consequence of the recent rise of China, India, and other peripheral countries as well as the demise of the “Second World” (also see Heller, Rueschemeyer, and Snyder 2009). Lee (2009), for instance, argues that “the polarized shape of global inequality once premised by *dependistas* . . . seems to more fit to the reality from the viewpoint of the first decade of the twenty-first century” (p. 289). The sudden revival of dichotomous categorizations such as “global North” versus “global South” (or the North-South divide) in studies of international development is also clear evidence of this implicit revival of dependency theory. While some scholars interpret these transformations as an emerging differentiation/bifurcation within the periphery or the Third World (Shafer 1994), others see them as evidence of the demise of the capitalist world-system as we know it (Li 2008:14–15).

This article begins with the premise that we cannot understand the contemporary transformations in global hierarchies of wealth in light of competing theories without putting the current moment into a broader historical context. Only a *longue durée* analysis of transformations of global hierarchies of wealth within the capitalist world-economy can help distinguish novel features of contemporary transformations from recurrent dynamics of historical capitalism. Building upon this premise, this article develops Arrighi and Drangel's (1986) method of conceptualizing, operationalizing, and measuring the global distribution of wealth within the capitalist world-economy through the adoption of a new statistical analysis and a *longue durée* perspective.

I put forward a dual hypothesis. First, I argue that the trimodal (core-semiperiphery-periphery) structure of the capitalist world-economy—which remained relatively stable from the 1930s to the 1990s—has been dissolving. This dissolution, together with the deepening of the crisis of US world hegemony, has led to the emergence of a new four-tiered (i.e., quadrimodal) structure starting at the turn of the twenty-first century. Second, I claim that this transformation is neither evidence for modernization theory nor a symptom of the demise of the capitalist world-economy. This is because from the sixteenth century to the present the hierarchical structure of the capitalist world-economy has been fundamentally transformed during each period of world hegemonic crisis and systemic chaos. These successive reconfigurations of the global hierarchy of wealth have occurred during intensified periods of crisis because (a) historical capitalism expanded and incorporated new territories for capital accumulation and (b) global relocation of capital produced new geographical centers of production and trade as well as new zones for exploitation, surplus production, and resource appropriation. As a result of these transformations, the distribution of the global hierarchy of wealth in the capitalist world-economy has, from one systemic crisis to the next, been superseded by more complex forms.

CHANGING MODES OF THE CAPITALIST WORLD-ECONOMY

The perspective utilized in this article sees transformation and reconstruction as essential features of the capitalist world-economy, as emphasized by Marx ([1867] 1992) and Schumpeter (2003). This is because historical capitalism survives crises by transforming and reconstructing the way in which it operates. As Fred Block (2000) once put it, “Capitalism cannot rely on simple continuity over time because it is continually generating new conflicts and contradictions that have to be resolved or contained through conscious activity” (p. 89). During the evolution of historical capitalism in the *longue durée*, different stages of capitalist development have produced different forms of *structural constraints* for capital accumulation, which then become the driving force of *structural changes* within dominant capitalist economies and different forms of imperialism (Wright 1978:163–80).

The theoretical and methodological assumptions of the world-systems perspective have greater potential to explain the relationship between crisis and transformation in the hierarchical structure of wealth within the capitalist world-economy than do alternative paradigms of international development. The world-systems perspective is preferable to modernization theory because it can capture the polarizing tendencies of historical

capitalism more accurately. It is also preferable to dependency theory because (a) it emphasizes the necessity to examine historical capitalism as a *totality* (with its spatial and temporal interconnections) and (b) it has the potential to identify emergent contradictory locations in relational exploitation and exclusion processes of the capitalist world-economy (e.g., semi-peripheral zones), which can simultaneously exploit certain regions of the world-economy (the periphery) while being exploited by other regions (the core). Finally, the cyclical crisis dynamics of capitalism play a more central role in the world-systems perspective than in alternative theoretical models.

The notion that the capitalist world-economy transforms during periods of systemic crisis is not foreign to the world-systems perspective. Many world-systems scholars have identified significant transformations in social, political, and economic structures of the modern world-system over the *longue durée* that occurred during periods of systemic crisis and chaos (Arrighi 1994; Arrighi and Silver 1999; Chase-Dunn 2005; Chase-Dunn and Inoue 2012). In their analysis of the long-term historical evolution of the capitalist world-economy, Arrighi and Silver (1999) present a theoretical model explaining how social, political and economic structures of the capitalist world-economy fundamentally transform during periods of world hegemonic crisis and transition. They argue that during periods of global-hegemonic crisis the capitalist world-economy does not simply reproduce itself; “a process of radical reorganization of the modern world-system” takes place, which in turn “changes the way in which the system operates and reproduces itself” (p. 21; also see Silver and Arrighi 2003). Similar changes also occur in the interstate system, which has evolved and transformed over the *longue durée*, especially during periods of hegemonic decline characterized by a crisis in global leadership (Arrighi 1994; Arrighi and Silver 1999; Chase-Dunn and Inoue 2012).

Following in the footsteps of this literature, I will turn to the relationship between systemic crises and transformations of the hierarchical wealth structure of the capitalist world-economy. My central argument is that the trimodal (core-semiperiphery-periphery) structure of the capitalist world-economy has not been immune to radical changes that occur during world hegemonic crises and transition periods. These transformations can be seen as analogous to transformations in class structure under capitalism. We know that historical capitalism has constantly been restructuring class-based hierarchies, making and unmaking new layers of classes on a global scale (Silver 2003; Silver and Slater 1999). Especially during periods of intensified crisis, class-based distinctions have been transformed in three ways: (a) the expansion and contraction of the middle classes; (b) the making and unmaking of distinct groups of working classes—such as labor aristocracies, new working classes, or new (latent or stagnant) reserve armies—that are distributed unevenly across geographical space; or (c) the creation of different segments of working classes by the privileging or exclusion of particular sections of the working classes on the basis of race, gender, ethnicity, or citizenship (Silver and Karataşlı 2015). Following this same logic, I argue that during intensified periods of crisis and chaos the core-periphery structure of the capitalist world-economy has also been transformed through the making and unmaking of different relational strata of wealth on a global scale. To be able to observe these changes from a world-systems perspective, however,

[We] must be prepared to unthink what many of them have come to regard as the quintessence of world-systems theory. This is the idea that, in spite of their extraordinary geographical expansion, the structures of the world capitalist system have remained more or less the same ever since they first came into existence in the “long” sixteenth century. This was a useful working hypothesis in the formative stages of PEWS macrosociology. The more I have worked with it, however, the more I have become convinced that the hypothesis does not stand up to historico-empirical scrutiny, and even worse, it prevents us from getting at the heart of the capitalist dynamics, both past and present. (Arrighi 1999:125)

The claim that the capitalist world-economy has had a relatively stable trimodal “core, semiperiphery, and periphery” structure since its emergence in the sixteenth century (see Hopkins et al. 1987; Hopkins and Wallerstein 1982:47; Wallerstein 1975:368; 1979:69, 96–97) is one part of this hypothesis. Arrighi’s (1999) warning must be taken together with a large number of studies that provide constructive criticism of the relatively stable trimodal distribution hypothesis by extending Wallerstein’s research agenda in new directions. While some scholars have turned their attention to the emerging problems of operationalizing these three zones, or a lack of conceptual clarity regarding the notion of the “semiperiphery” (Arrighi and Drangel 1986; Aymard 1985:40; Evans 1979:291; Hechter 1975; Milkman 1979; Sanderson 2005:186–87), others have found it more useful to empirically examine the world-systems hierarchy not just as three clusters but as multiple clusters (Mahutga 2006; Nemeth and Smith 1985; Snyder and Kick 1979). In the same vein, many world-systems scholars suggest that the core-periphery hierarchy must be seen as a continuum rather than as discrete clusters; the hierarchy must also produce continuous measures of position in the world-system (Chase-Dunn 1998; Jorgenson 2006; Kentor 2000; Mahutga 2006; Van Rossem 1996).

While the world-systems hierarchy is actually a *complex continuum*—as Chase-Dunn (1998:214) puts it—the way countries and regions have historically clustered along this continuum (e.g., how the number and size of existing clusters have changed over time) provides us with crucial information about the structure of the capitalist world-economy and how it transforms over time. The orthodox world-systems assumption is that the trimodal structure has remained largely unaltered by the cyclical crisis tendencies of historical capitalism because the capitalist world-economy manages to reproduce its three-tiered (core-semiperiphery-periphery) structure by expanding its geographical boundaries and relocating old productive activities to new locations from one systemic crisis to the next (Hopkins et al. 1987:767–73; Hopkins and Wallerstein 1982). According to this particular conceptualization, however, periods of growth and crisis, expansions and contractions, push the system to expand without *actually* transforming its essential features (Block 2000:89). This is not to say that there is no mobility in the system. On the contrary, though individual countries or regions change their positions in the world-system hierarchy, the hierarchical core-semiperiphery-periphery structure remains essentially the same.¹ Hence, in Pieterse’s (1988) words, “There is an in-built assumption of equilibrium” (p. 260) in this conceptualization.

An alternative way of thinking about the capitalist world-economy is to assume that it actually evolves and changes its hierarchical structures *over time* to survive crises. Building

upon Marx ([1867] 1992) and Schumpeter (2003), we can argue that during periods of world hegemonic crises and systemic chaos, solutions implemented to enable the survival of the system (e.g., incorporation of new regions and geographical relocation of capital) result in radical transformations in geographical hierarchies of wealth on a global scale and produce alternating modes of distribution. In periods of systemic crisis, not only do possibilities for upward and downward mobility increase, but it also becomes more likely for a number of countries to move to new intermediate positions, creating new clusters and zones that did not exist before. Hence, new modes in the global distribution of wealth can emerge during periods of intensified crisis.

Borrowing terminology from complex systems analysis, we can conceptualize the capitalist world-system as a metastable complex system capable of undergoing rapid transitions to a new equilibrium state during periods of systemic crisis (Limburg et al. 2002; Mitchell 2009). Modes of the global wealth hierarchy are dynamic, shifting from unimodal to bimodal, from bimodal to trimodal, and even to new emergent patterns. This conceptualization can be derived from Marx's ([1867] 1992) claim that "the constant tendency in equilibrium [in different spheres of production under capitalism] is exercised only against the constant upsetting of this equilibrium" during periods of crisis (pp. 355–56), which Schumpeter later called "creative destruction." As such, the global hierarchy of wealth can be best characterized by the notion of *punctuated equilibria*—the system experiences long periods of relative stability punctuated by periods of major change and transformation (Mitchell 2009:84–85). In the *longue durée* of the capitalist world-economy, periods of world hegemonies are characterized by the relative stability of geographical hierarchies of wealth; on the contrary, periods of world hegemonic crisis and transition are characterized by the reconstruction and transformation of existing hierarchies.

As with all complex systems characterized by *punctuated equilibria*, historical *contingencies* play a key role in this evolution (Mitchell 2009:85–86). Precisely because of these historical contingencies, it is not possible to know a priori how the system will evolve during periods of systemic crisis. After all, this transformation is contingent upon the interaction between (a) the diverse components of the system (including the behavior of great powers, i.e., the hegemon and its rivals—struggles between and within states in the interstate system, class struggle on a systemic level, the exact combination of links and networks between states and regions); (b) world-system-level structural processes (cyclical and secular patterns); and (c) the system's relationship with other systems and its "external" area. Like the historical contingencies, these complex interactions make it impossible to know a priori how the system might evolve during periods of crisis. For this reason Janet Abu-Lughod (1989) once noted that "theories of chaos" may be more useful for world-systems analysis than the "same cause yields same effects" logic. "In world-systems, as in weather systems, small localized conditions may interact with adjacent ones to create outcomes that might not otherwise have occurred, and large disturbances sometimes flutter to an end while minor ones may occasionally amplify wildly, depending upon what is happening in the rest of the system" (pp. 21–22; also see Arrighi and Silver 1999:21–22). This understanding is also useful because it leaves room for agency to change and transform the functioning of the system.

The punctuated equilibrium model leads to a very different prediction for the long-term historical evolution of global hierarchies of wealth within the capitalist world-economy than do alternative paradigms of development. Modernization theories predict that the world-economy will gradually converge into a unimodal/normal distribution. Dependency theories claim that the world-economy has hitherto been characterized by a stable bimodal hierarchy (i.e., the core-periphery structure). The relatively stable trimodal distribution hypothesis of the traditional world-systems perspective suggests that the world income hierarchy has been characterized by a relatively stable core-semiperiphery-periphery structure. In contrast to these explanations, the punctuated equilibrium model argues that the capitalist world-economy has had a global wealth hierarchy with a distinct modal shape that has transformed during periods of hegemonic crisis and transition, paving the way for new forms of hierarchies.

METHOD AND DATA

In the literature, many studies operationalize world-systems position, status, and hierarchy for social scientific analysis (Bollen 1983; Bollen and Appold 1993; Clark and Beckfield 2009; Kentor 2000; Mahutga 2006; Muller 1988, 1995; Nemeth and Smith 1985; Rau and Roncek 1987; Snyder and Kick 1979; Terlouw 1993). Most of these studies, however, do not directly test the relatively stable trimodal distribution hypothesis of world-systems theory, or for that matter the stable bimodal distribution hypothesis of dependency theory. Rather, they define various political and economic patterns and networks among states in different structural positions in the capitalist world-system.

The Arrighi and Drangel (1986) study is one of the few exceptions in this regard because it aims to directly test the empirical validity of the relatively stable trimodal distribution hypothesis of the world-systems perspective. Reconstructing and operationalizing Wallerstein's arguments and testing this theory against the modernization and dependency theories, the Arrighi-Drangel study showed that world income inequality was characterized by a relatively stable trimodal distribution from 1938 to 1983; this finding was also used by Wallerstein (2005) as a major piece of evidence for his theory (p. 1267). Follow-up studies building upon the Arrighi-Drangel method provided similar and robust results, showing a constant trimodal distribution through the course of the twentieth century, as expected by the world-systems perspective (Arrighi et al. 1996; Babones 2005; Korzeniewicz and Martin 1994).

However, the main limitation of the Arrighi and Drangel (1986) study is the short time span of the data and analysis, which was not sufficient to come to a conclusion "concerning the cyclical rhythms and the *longue durée* of the world economy and its three-tiered structure" (p. 58). While some studies have extended and advanced this method by using additional data points and years (Korzeniewicz and Martin 1994), alternative categorizations of geopolitical space (Taylor 1988), and new tools for analyzing distributions (Babones 2005) or new strategies for analysis (Arrighi et al. 1996), so far no study—neither by supporters nor by critics of the theory—has attempted to apply this method to analyze the global distribution of wealth in the *longue durée* of historical capitalism. Existing empirical studies mostly focus on what Hobsbawm (1994) called the "short twentieth century." The analysis presented in this paper aims to overcome this limitation by extending the

Arrighi-Drangel method through the adoption of a new statistical analysis and a *longue durée* perspective.

Measuring Zones of the Capitalist World-economy: The Arrighi-Drangel Method

The Arrighi and Drangel (1986) study aimed to provide a method through which we can (a) overcome some of the operationalization problems associated with the notions of the core, semiperiphery, and periphery; and (b) empirically observe how many zones there are in the capitalist world-economy. According to Wallerstein, these three zones of the capitalist world-economy are products of different mixes of core-type and peripheral-type economic activities in the world-economy due to the capitalist division of labor. Core regions of the capitalist world-economy tend to specialize in core-type (high-profit, high-wage) economic activities, which derive most of the overall benefits from the world division of labor. Peripheral regions tend to specialize in peripheral-type activities (low profit, low wage), which derive few of the overall benefits of the world division of labor. Semiperipheral regions incorporate a *balanced/even* mix of core- and peripheral-type economic activities—hence they derive more benefits from their participation in the world division of labor than peripheral regions but less than core regions. As a consequence of this three-tiered world division of labor, the global hierarchy of wealth is characterized by a relatively stable trimodal distribution known as the core, semiperiphery, and periphery.

The main problem for the operationalization of this theory is that no particular economic activity can be defined transhistorically as core type or peripheral type. As an evolving system, historical capitalism has constantly been altering products and production techniques. Hence, core-/peripheral-type activities and the benefits they produce have hitherto been contingent on the ever-changing dynamics (e.g., forces of production) of historical capitalism (Arrighi 1990; Arrighi and Drangel 1986). In the sixteenth century, for instance, textile production (e.g., in Holland) was a core-type activity characterized by high wages and high profits. In the mid-twentieth century, however, it became a peripheral-type activity characterized by low wages and low profits. The reverse can also be true. In the sixteenth century, Poland (a peripheral country) traded its wheat for Holland's textiles; in the mid-twentieth century, many peripheral countries started to import wheat from core countries (Wallerstein 1979:71). In reality, "Any activity can become at any particular point in time core-like or periphery-like, but each has that characteristic for a limited period" (Arrighi and Drangel 1986:18). Thus it is not possible to know and classify a priori which activities are core type and which are peripheral type. This limitation becomes an important obstacle before the operationalization of core- and peripheral-type activities in different regions of the world at different points in time.

The Arrighi-Drangel method attempted to overcome this limitation by assuming that, although we cannot directly operationalize core-type and periphery-type activities in the world division of labor, we can still indirectly measure its economic consequences. If Wallerstein's theoretical insights are correct, then the consequences of this particular type of division of labor must necessarily be reflected in a *trimodal* distribution of the world population by gross national product (GNP) per capita levels, with the latter serving as a proxy for differences in the command over total benefits of the world division of labor

(Arrighi and Drangel 1986:31). Building upon this premise, Arrighi and Drangel (1986) examined the distribution of the world population with a logarithm of gross national product (GNP) per capita—expressed in a common monetary unit converted to US dollars using market exchange rate conversions—for selected years (also see Babones 2005; Korzeniewicz and Martin 1994).

Three properties of this method must be highlighted. First of all, the Arrighi-Drangel method does not rank states along a continuum (or network) or use certain (theoretically chosen or statistically conventional) cutoff points to operationalize distinct zones of the world-economy, as many contemporary scholars do (Clark and Beckfield 2009; Jorgenson 2006; Kentor 2000; Mahutga 2006; Muller 1988; Nemeth and Smith 1985; Snyder and Kick 1979; Van Rossem 1996). On the contrary, it assumes that empirical clustering of the world population in distinct log-GNP per capita levels would inherently reflect the hierarchical structure of the world division of labor. In doing so, this method departs from most existing methods measuring world-systems position, where the number of zones presumed to exist (whether one, two, three, or ten zones are identified) remains the same across time but individual countries can move between these fixed zones. In the Arrighi-Drangel method, the number of zones in the capitalist world-economy can change (e.g., from three to one, or from two to four). This allows us to observe not only the transformation *within* the hierarchy of the capitalist world-economy (i.e., mobility across different zones) but also the transformation *of* this hierarchy (i.e., changes in the number of zones).

Second, this method does not use multiple indicators of power (e.g., military power, commercial power, financial power, and global dependence/independence) to differentiate zones of the capitalist world-economy, as does recent research on the world-systems position (see Kentor 2000). It instead provides us with a *unidimensional* measure: GNP per capita. This choice was made for two reasons. On the one hand, it closely follows in the footsteps of the original Wallersteinian formulation and sees GNP per capita as a proxy for measuring the mix of core-peripheral activities in a region. On the other hand, this strategy implicitly assumes that in the capitalist world-economy command over world economic resources (manifested as GNP per capita) is convertible into other forms of political, military, and commercial power (also see Arrighi and Drangel 1986:22–26).

Third, similar to other studies that analyze the clustering of countries along a highly positively skewed GNP per capita distribution, this study also uses the *logarithm* of GNP per capita rather than absolute values (also see Bianchi 1997; Bourguignon and Morrisson 2002). In their study, Arrighi and Drangel (1986) explain that they use the log of GNP per capita not only because of the highly skewed distribution of GNP per capita in the world but more importantly because they are “interested in the relative rather than the absolute differences among states” (p. 13). The use of logarithms is important because economic growth over long periods of time has a nonlinear (i.e., exponential) effect on the variance among countries along the world income distribution. Even if we assume that all countries have similar and stable growth rates, the compound effect of growth over long periods of time produces lower levels of variation in GNP per capita levels among low-income countries and much higher levels of variation among rich countries. Considering that peripheral countries tend to have lower growth rates on average than core countries because of the

polarizing tendencies of capitalism, we can expect this effect to be much more prominent. Hence, the clustering of rich countries (as outliers) cannot possibly be observed with the same GNP per capita intervals used for low-income countries. Log transformation, however, enables us to see these clusters and the relative differences between countries by pulling and pushing on the tails of the world income distribution. The Appendix presents examples of this transformation for selected years.

Data

One of the main reasons for the lack of empirical studies concerned with the *longue durée* evolution of the capitalist world-system is the absence of long-term historical data on the matter (Snyder and Kick 1979:1100). To address this problem, I will use the latest version of Maddison's (2010) GDP and population estimates. Long-term economic estimations by Maddison—also known as the Maddison Tables—have been widely used in historical analyses of global inequality (Bourguignon and Morrisson 2002) and hegemonies (Chase-Dunn et al. 2005; Kwon 2011), studies of historical waves of globalization and core-periphery dependency relationships in the world-system (Chase-Dunn, Kawano, and Brewer 2000; Kentor 1998), and studies that focus on long-term geopolitical transformations on a global scale such as social conflicts and war (Wimmer and Min 2006). In the literature, these figures are often referred to as the best available GDP estimates with the fewest nonmissing values for historical studies (Wimmer and Min 2006:884–85). Our comparison of the Maddison data set with its alternatives—such as the Cross National Time Series (CNTS) data set—revealed that Maddison's estimations are also more consistent in terms of methodology than other alternative data sets. Despite the advantages of Maddison's estimates, however, they must be used with great caution because of some peculiar features and limitations (Jerven 2012).

First of all, these measures must *not* be seen as absolute measures of GDP for historical periods. Maddison's estimates must be interpreted as proxies of *relative* economic development levels of different regions of the world at different points in history. These features of the Maddison Tables, however, fit nicely into the Arrighi-Drangel method, which is also "interested in the relative rather than absolute differences among states" (Arrighi and Drangel 1986:31) in terms of their development levels. In other words, these estimates are designed to compare different regions of the world at a particular period of time (or to compare changes in the economic development level of a particular region at different time periods) rather than to describe the exact GDP level of a region at a particular point in time.

Second, one must be careful when interpreting the unit of analysis in the Maddison data. Instead of using the territorial boundaries of existing political units (e.g., states, empires, etc.), the Maddison Tables use fixed regions (boundaries of states in the year 2001) as the unit of analysis; these boundaries may or may not correspond to the boundaries of actual states in the historical eras under examination. Do not be surprised to find "Italy" or "Greece" in the year 1500. This choice, however, does not contradict the methodological premises of world-systems analysis. On the contrary, by refusing to use existing states as units of analysis, this approach overcomes the methodological nationalism inherent in existing scholarship (Wimmer and Schiller 2002). We must also remember that it is possible for

different regions of an empire to be in different zones of the capitalist world-economy. Hence, Maddison's unit of analysis helps us analyze these distinct positions as well.

Third, one must note that instead of using foreign exchange rate conversions like Arrighi and Drangel, Maddison estimates rely on Geary Khamis Purchasing Power Parity (PPP) as a common currency unit. There is an ongoing debate regarding which conversion rate (market exchange conversions vs. PPP conversions) is more useful for analysis of global inequalities (Arrighi et al. 2003; Firebaugh 2000; Korzeniewicz and Moran 1997; Sala-i-Martin 2006). In the case of long-historical studies, however, this debate loses significance. This is mostly because both PPP and market exchange rate conversion estimations use similar approaches (historical estimates of growth rates and population changes) for their historical estimates. One must remember that no over-time PPP data were ever collected. As Korzeniewicz and Moran (2009) put it, "Historical GNP-GDP data adjusted by PPPs are simply an index derived from existing GNP-GDP data series [using available market exchange rate conversions], which use the latest round of PPP estimates to adjust national incomes to a new baseline, constant through time" (p. 62). This change in the baseline, however, does not change distributional properties of the data. The convergence in strategies to estimate cross-national development becomes more evident in longer historical studies, for which economic historians often rely on the same historical growth rates and population figures to extrapolate the existing data.²

Fourth, the Maddison Tables provide us with GDP estimates instead of GNI estimates. Ideally, we would prefer to conduct the analysis using GNI estimates, which are a better conceptual fit for our purposes. However, in the absence of such data, we rely on GDP estimates. This limitation, however, is not very damaging because actual differences in GDP per capita versus GNI per capita estimates lose significance when we look at the overall distribution on a "global" scale. Our pretests comparing the Arrighi-Drangel method using the World Bank's GNI per capita and GDP per capita values (both with a constant exchange rate, the Atlas method, and PPP conversions) showed no statistical difference in the emerging patterns of the global distribution of wealth. So we can rely on Maddison GDP data assuming that the emerging global distribution of wealth using the GDP data will not be different from the global distribution of wealth derived from the GNI data.

Finally, an examination of the global distribution of wealth in the capitalist world-economy from 1500 to the present must contend with the data missing from the Maddison Tables. I used linear interpolation when estimations before and after a missing year existed, as is standard in the literature. When there was no estimation before a missing year, I extrapolated values on the basis of the growth rates of comparable neighboring countries in the region of the existing region/country, a strategy used by Bourguignon and Morrisson (2002).

Here, I must note that the data imputation problem is handled in relation to the changing spatial boundaries of the capitalist world-system. It is important to remember that the trimodal distribution is conceptualized to describe the hierarchy of wealth, not in the world as a whole, but just in the *capitalist world-economy*. Wallerstein's notion of the *world-economy* (with a hyphen) derives from Braudel's notion of *économie-monde* (similar to the term *Weltwirtschaft* in German). These terms do not necessarily mean an economy encompassing the "whole world" but rather an economy whose internal division of labor

constitutes a “world” in and of itself. This means that the number of countries/regions that are included in an analysis must change according to changes in the boundaries of the capitalist world-economy. This has consequences for the imputation of missing values: we do not need to impute all missing values in the data set. We simply need to impute the missing values of regions/countries that were already incorporated into the capitalist world-system at the given point in time.

Unfortunately, there is no consensus in the literature with respect to the exact boundaries of the capitalist world-system at certain points in time or how to operationalize these boundaries. To overcome this problem, I relied on Wallerstein’s own narrative and the Fernand Braudel Center’s Incorporation Research Working Group findings (Hopkins et al. 1987; Wallerstein 1989). According to these studies, the capitalist world-system in the sixteenth century included only European countries (western Europe, central Europe, and some parts of eastern Europe) and settler colonies in Iberian America. The incorporation of the Caribbean region and colonial North America occurred in the seventeenth century. The incorporation of the Indian subcontinent, the Ottoman Empire, the Russian Empire, and West Africa began between 1733 and 1813 and was completed by the first half of the nineteenth century. The incorporation of China—and most of East Asia for that matter—started with the Opium War of 1840 and continued in the last quarter of the nineteenth century. By the late nineteenth and early twentieth centuries, after the Scramble for Africa, the capitalist world-system had incorporated all regions/territories of the world.

Gaussian Kernel Density Analysis

Our analysis will also extend the Arrighi-Drangel method with more advanced statistical tools. In our application of this method to a longer historical frame, I will use Gaussian kernel density analysis instead of histograms, as suggested by Babones (2005). Kernel density estimates are widely used in the literature to calculate smoothened probability density functions of world income/wealth distributions (Babones 2005; Bianchi 1997; Bourguignon and Morrisson 2002). A kernel density estimate is performed by summing the weighted values calculated with a kernel density function K ,

$$\hat{f}_K = \frac{1}{nh} \sum_{i=1}^n K\left(\frac{x - X_i}{h}\right)$$

where n is the number of cases, h is the smoothing parameter (the bandwidth), and K is the following Gaussian function:

$$K[Z] = \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}}$$

This approach is analogous to Arrighi-Drangel’s histograms, but it improves upon the Arrighi-Drangel method in two ways. First, it allows us to observe emerging modes more easily by providing smoother distributions than the original Arrighi-Drangel method, which relied on (a) histograms with bin-widths of 0.05 units and (b) a three-interval moving average to smooth them (Arrighi and Drangel 1986:32). Second, it helps estimate boundaries between different zones of the capitalist world-economy more precisely than the

Arrighi-Drangel method, which used low-frequency intervals as the boundaries of each zone and faced difficulties when there were multiple low-frequency intervals to choose from (Arrighi and Drangel 1986:32).

To examine the global hierarchy of wealth in a given year, we relied on the following strategy. First, we calculated Gaussian kernel estimates of the density function of the log-GDP per capita of all countries/regions in that year, weighted by their population. To determine the zones of global income distribution, we converted the kernel density estimates into polynomial functions and calculated the number of local maxima and minima of each polynomial. Local maxima show the “modes” of each of the zones of the world-economy, and local minima show the boundaries that divide them from each other. More specifically, a polynomial function with one local maximum and no minima becomes a unimodal distribution with no clear core-periphery differentiation. A distribution with two local maxima and one local minimum becomes a bimodal distribution with a core-periphery differentiation. A distribution with three local maxima and two local minima is called a trimodal distribution with core, semiperiphery, and periphery modes.

An important part of kernel density analysis is the choice of optimal smoothing parameters (h in the kernel density formula above), also known as the bandwidth. To make our kernel density analysis comparable to the original Arrighi-Drangel study, I used a fixed bandwidth of 0.10. In this bandwidth, the Gaussian kernel density distributions of world population in the period 1938–85 become almost identical to the smoothed histograms in Arrighi and Drangel (1986).

Figure 1 illustrates this for the year 1960. The top row of the figure shows the Arrighi-Drangel histogram for the year 1960, with and without the three-interval moving average (each interval corresponds to a 0.05 log-GDP per capita). The bottom row illustrates the Gaussian kernel densities with varying bandwidths. When the bandwidth is too small (e.g., $h = 0.02$), it shows properties of undersmoothing and becomes closer to the original data with no moving average. When the bandwidth is too high (e.g., $h = 0.50$), the distribution shows properties of oversmoothing by not showing any variation at all. After testing different bandwidths for different years, I decided to use a bandwidth of 0.10, which is optimal for replicating the Arrighi-Drangel analysis.³

FINDINGS

Changing Modes of the Capitalist World-economy

The findings show that the global hierarchy of wealth within the capitalist world-economy has not been characterized by a stable structure—it gradually moved from a unimodal to a bimodal distribution and then to a trimodal distribution over the *longue durée*. To illustrate this process, figure 2 compares kernel density estimates of world populations by log-GDPPC in three selected years that correspond to (a) the height of the Dutch world hegemony (1700), (b) the height of the British world hegemony (1850), and (c) the height of the US world hegemony (1950). As figure 2 shows, the global distribution of wealth had a singular mode in 1700. It had two modes in 1850 (a center and a periphery, as expected by dependency theory) and three modes in 1950 (core, semiperiphery, and periphery, as expected by world-systems theory).

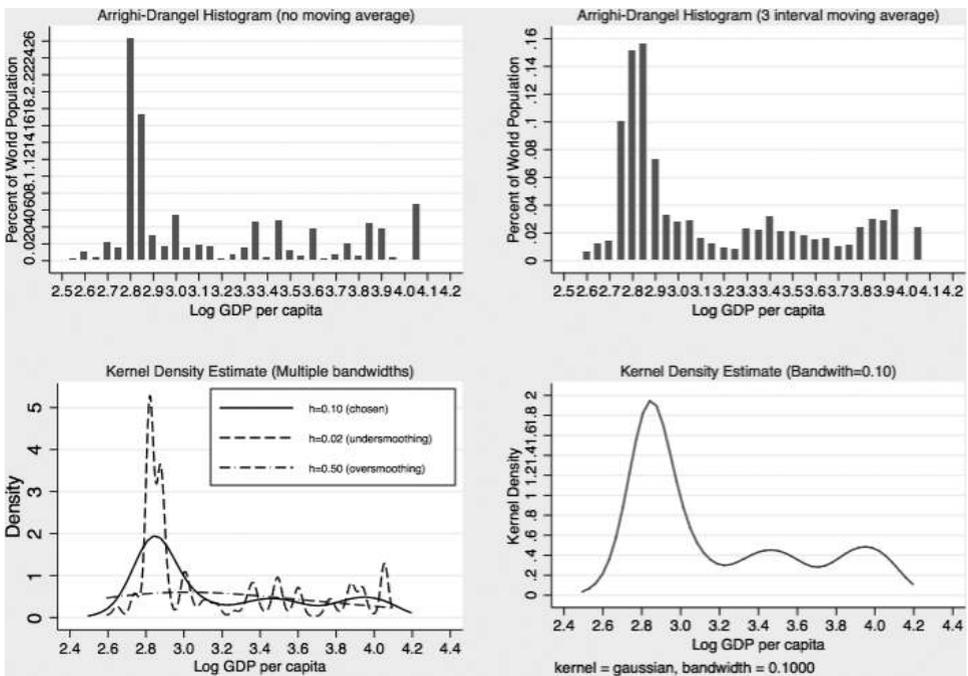


FIGURE 1. Histograms versus Kernel Density Analysis, Year 1960

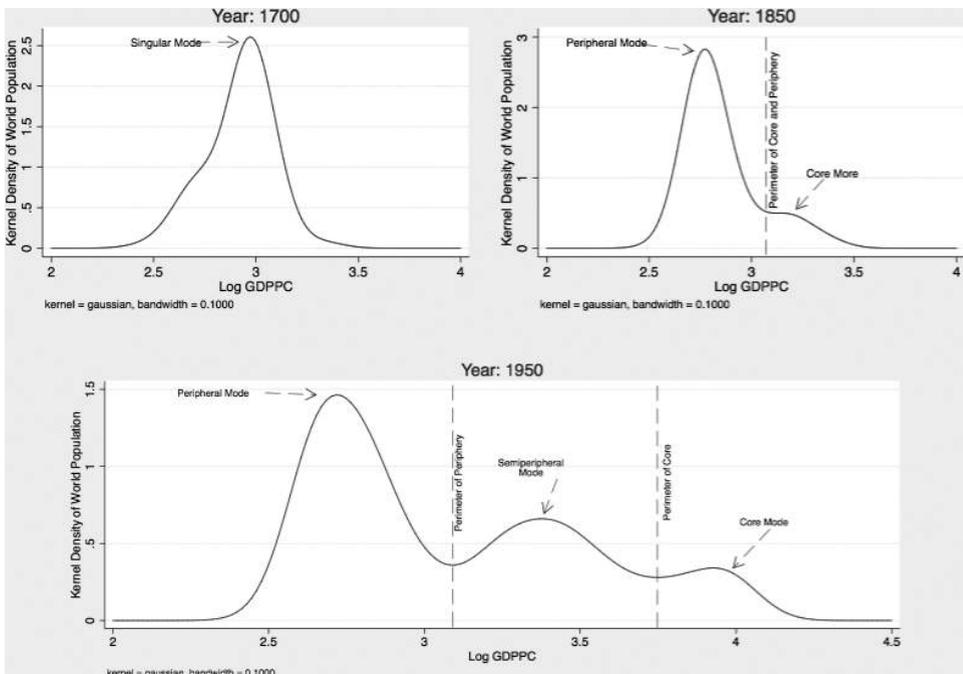


FIGURE 2. Global Distribution of Wealth in 1700, 1850, and 1950

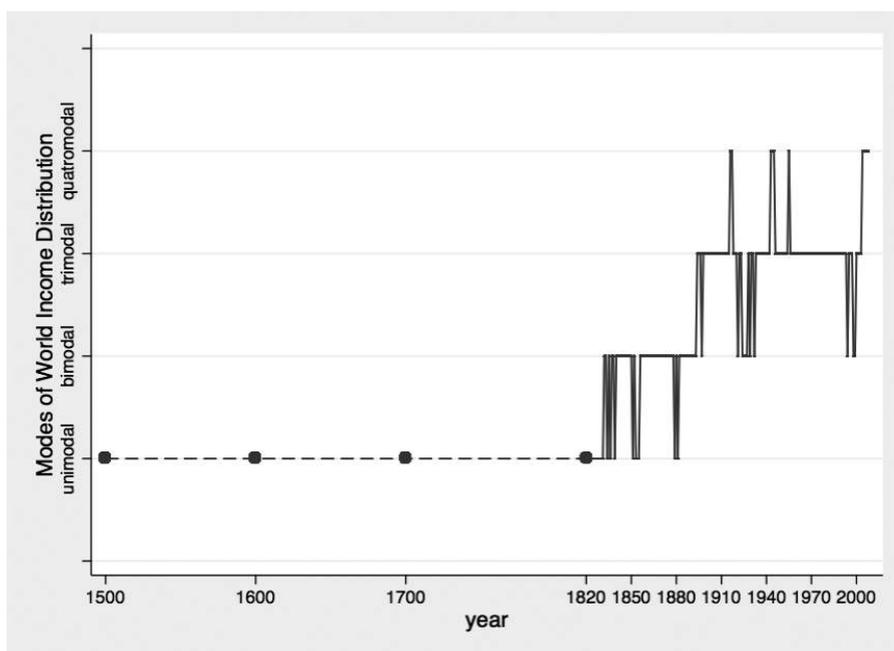


FIGURE 3. Modes of the Global Distribution of Wealth, 1500–2008

Figure 3 illustrates changes in the global distribution of wealth over time from 1500 to 2008 and supports our hypothesis that the capitalist world-economy has been characterized by dynamic and *punctuated equilibria*. The y axis of figure 3 shows the number of distinct modes (calculated as the local maxima of the population-weighted log-GDP per capita distribution) in each year. According to figure 3, the capitalist world-economy was characterized by a unimodal distribution from the sixteenth to the nineteenth centuries.⁴ This means there was no core-periphery or core-semiperiphery-periphery differentiation according to the Arrighi-Drangel method. From the early nineteenth century to the late nineteenth century (during the British world hegemony) the capitalist world-economy had two modes. Hence it was characterized by a bimodal distribution, as expected by dependency theorists. Despite some short-run fluctuations, the core-periphery differentiation remained largely stable over the course of the nineteenth century.

As figure 3 shows, a trimodal distribution emerged in the late nineteenth century. This three-tiered structure remained largely stable—apart from major fluctuations during World War I, the Great Depression, and World War II—until the late twentieth century. We must note that the short-run fluctuations in the trimodal distribution were also observed in the original Arrighi-Drangel study covering 1938–83 (Arrighi and Drangel 1986:36). These fluctuations, however, do not alter the fact that the capitalist world-economy had a relatively stable trimodal distribution during the twentieth century. Most interesting about this figure is that, ever since 1990, the relatively stable trimodal distribution has been dissolving. Moreover, we find powerful evidence that a new quadrimodal distribution is emerging in the early twenty-first century.

Figure 4 shows the changes in the log-GDPPC level of each mode (local maxima of the distribution) of the capitalist world-economy from 1500 to 2008. For each year, the figure shows how many modes there are in the capitalist world-economy and the log-GDP per capita level of these modes. The relative distance between the log-GDP per capita level of each zone tells us whether or not there is convergence or divergence in the global political economy. Figure 4 more clearly illustrates that the singular mode of the capitalist world-economy, which gradually rose from approximately 2.8 to 3.0 from 1500 to 1700, started to bifurcate into two distinct modes sometime between 1700 and 1820. This transition period overlaps with the Dutch world hegemonic crisis period. Because of the lack of data, we cannot say for sure when this transformation started. But we do know that in the early nineteenth century, the capitalist world-economy already had two distinct modes with two distinct trajectories of development. While the core mode increased its log-GDPPC level from 3 to 3.5 over the course of the nineteenth century, the peripheral mode remained stable at a log-GDPPC level of 2.75, illustrating the polarizing tendencies associated with the “development of underdevelopment” thesis put forward by dependency theorists.

Figure 4 also shows that the semiperipheral mode emerged in the late nineteenth century—at around a log-GDPPC level of 3.0—and remained a clearly identifiable mode until the late twentieth century. Especially after the 1950s, during the era of US-sponsored developmentalist ideology, all three modes increased their log-GDPPC level. But the relative gap between these three modes never disappeared, thus illustrating the notion of the “developmentalist illusion” (Arrighi 1990). In the late 1960s and early 1970s, the semiperipheral mode was closer than ever to the core mode. But in the post-1970 period, probably because

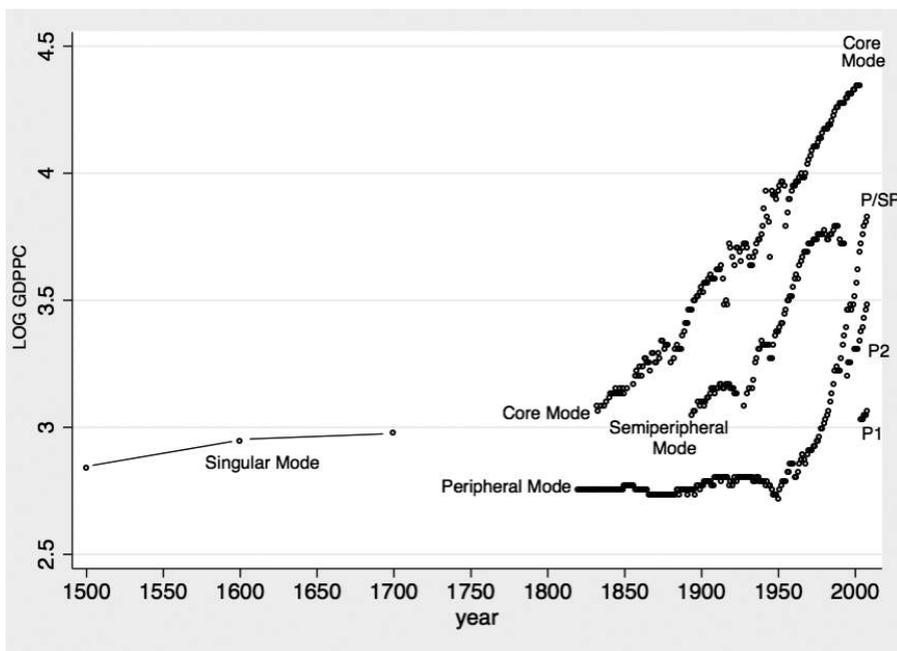


FIGURE 4. Changes in the Log-GDPPC Level of Each Mode of the Capitalist World-economy, 1500–2008

of the radical transformations in the global political economy (such as the shift from developmentalism to neoliberalism and US-led financialization), the distance between the core and semiperiphery further increased. In the last quarter of the twentieth century, the peripheral mode started to catch up with the semiperipheral mode. At the turn of the twenty-first century, the peripheral and semiperipheral modes started to merge, creating a new mode (designated as P/SP, at a level of 3.8 in 2008). The rest of the periphery was divided into two sections: the lower periphery (P1, at a level of 3 in 2008) and the upper periphery (P2, at a level of 3.5 in 2008).

Relative World Population Residing in Different Zones

Do these transformations support predictions of modernization theory? No, they do not. To explain why, figure 5 describes this trajectory from the perspective of the world population living in distinct zones of the capitalist world-economy. This analysis is important for assessing the validity of modernization theory, which suggests that the percentage of the world's population enjoying the living standards of the advanced/industrial countries will gradually increase because of the diffusion of modernization and industrialization.

The dots in figure 5 show the boundaries (local minima of the global distribution of wealth for each year) distinguishing the percentage of the world's population living within each zone. Until the early nineteenth century, it was not possible to find a division. In the early nineteenth century, however, 15 to 25 percent of the population of the capitalist world-economy lived in “core” regions, whereas 75 to 85 percent resided in the “periphery.” In the mid-nineteenth century, the size of the periphery expanded from approximately 75 percent

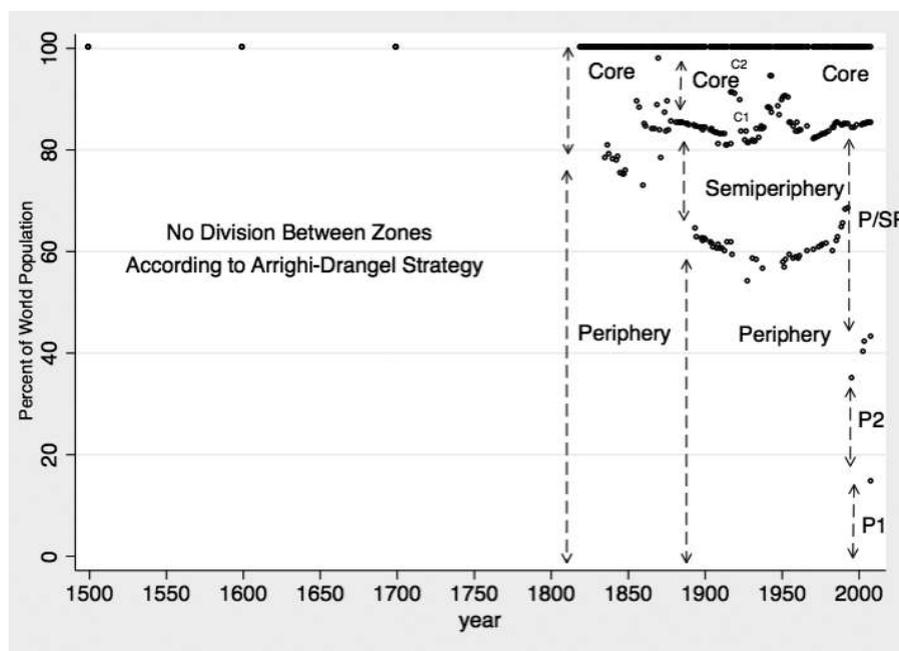


FIGURE 5. Changes in the World Population Residing within Distinct Modes of the Capitalist World-economy, 1500–2008

to 85 percent when the capitalist world-economy incorporated Asian territories from the periphery. In the late nineteenth century, the semiperipheral mode—hence the trimodal distribution—emerged, and around 20 percent of the world population found themselves in this intermediate zone. In the course of the US world hegemony, approximately 15 percent of the world population resided in the core, 25 percent in the semiperiphery, and approximately 60 percent in the periphery. In the late twentieth and early twenty-first centuries, however, this three-tiered structure has started to break down. In the twenty-first century, 15 percent of the world's population is still living in the core, around 40 percent is living in the new semiperipheral zone (P/SP), around 20 percent is living in the upper periphery (P₂), and 15 percent is living in the lower periphery (P₁).

These findings provide us with compelling evidence why these transformations do not support the modernization theory hypothesis. After all, the percentage of the world's population living in “core” regions has not been increasing over time. In the late nineteenth century, only 15 percent of the world population resided in core regions; in the early twenty-first century, the figure is still 15 percent. The major transformations do not seem to greatly affect people living in the core regions; they mainly affect people residing in “noncore” locations.

Stability, Crisis, and World Hegemonic Transitions

The findings also challenge assumptions regarding the complete novelty of contemporary transformations—as well as their association with modernization—by pointing out some recurrent patterns that have been absent in existing discussions. Putting the current moment into a longer historical frame, the findings show that analogous transformations have taken place during each period of world hegemonic crisis and transition. As expected by the punctuated equilibria model, major transformations of global hierarchies of wealth have taken place during periods of world hegemonic crisis and transition—which have been characterized by systemic crises in the capitalist world-economy (Arrighi 1994; Arrighi and Silver 1999)—while the hierarchies have remained relatively stable during periods of world hegemony.

To illustrate these dynamics, this section examines (a) kernel density graphs, (b) population-weighted scatterplots showing the individual positions of each country/region, and (c) average growth rates of the world's regions during periods of hegemony. The combined figures presented in this section—from figure 6 to figure 11—show us both *transformation of* and *transformation within* the “global” wealth hierarchy from one year (in the x axis) to another year (the y axis). The size of the circles reflects the population of each country/region in the latter year. The figures also show the consequences of this mobility in terms of the global distribution of wealth. The horizontal kernel density graph on the top x axis shows the global distribution of wealth in the former year, and the vertical kernel density graph on the y axis on the left shows the distribution in the latter year. To account for the incorporation of new regions from one year to another, kernel density graphs of the *latter years*—vertically integrated into the y axis of the scatterplots—show two kernel density distributions. The solid line shows the kernel density estimates *including* the newly incorporated regions; the dashed line shows the kernel density estimates *excluding* the newly incorporated regions.

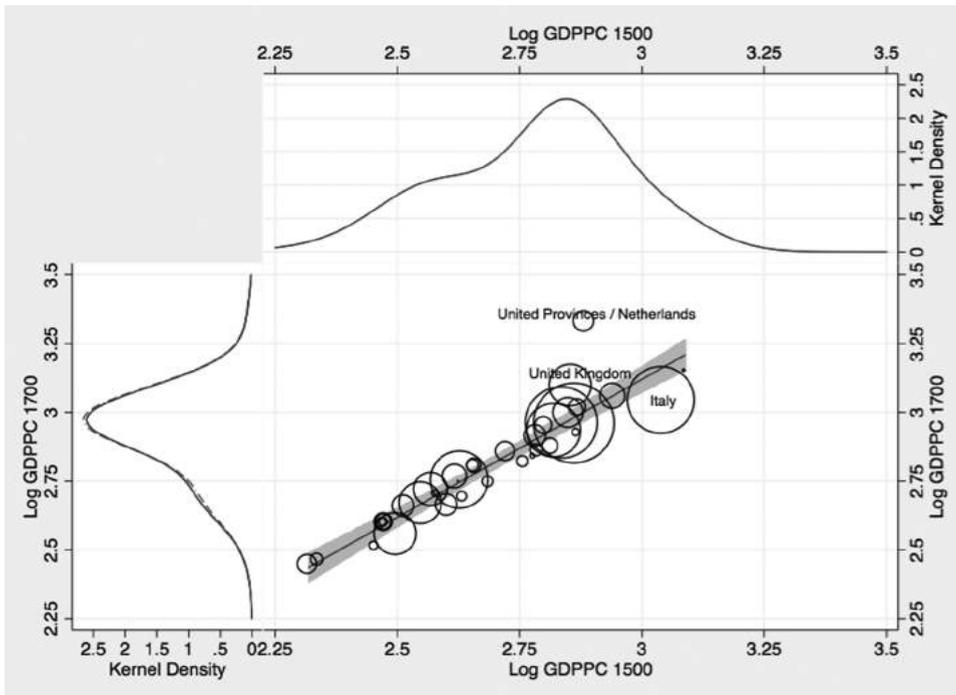


FIGURE 6. Rise of the Dutch World Hegemony, 1500–1700

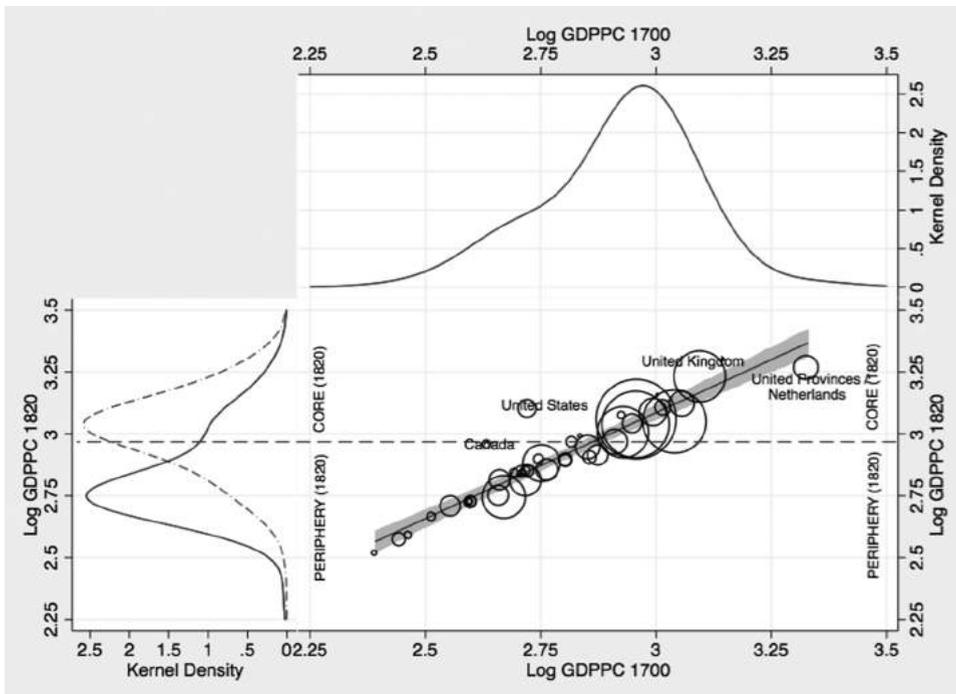


FIGURE 7. Crisis of the Dutch World Hegemony, 1700–1820

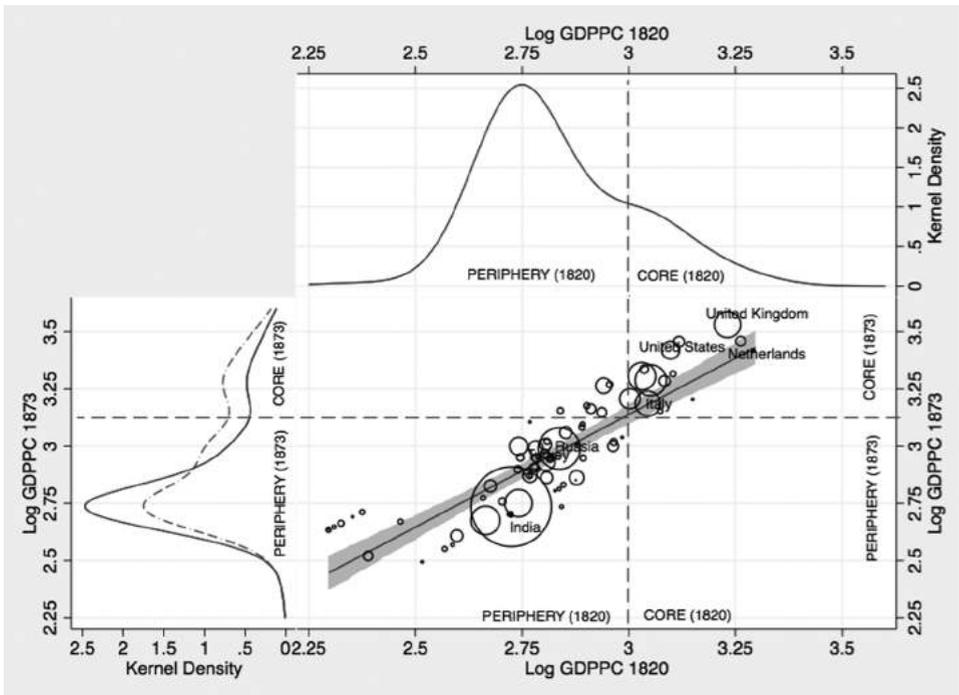


FIGURE 8. Rise of British World Hegemony, 1820–1873

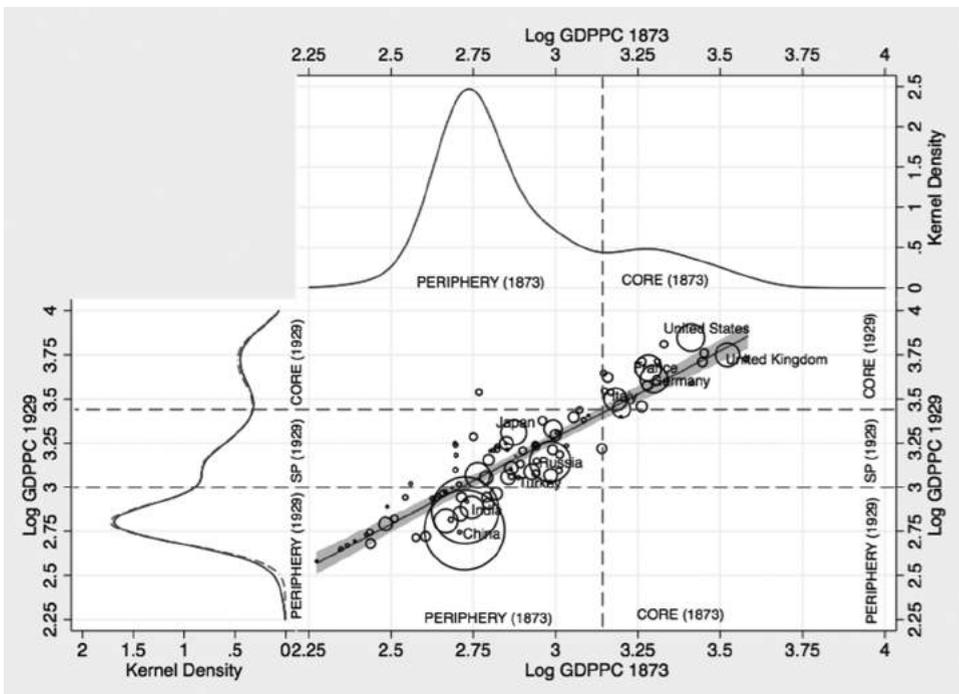


FIGURE 9. Crisis of the British World Hegemony, 1873–1929

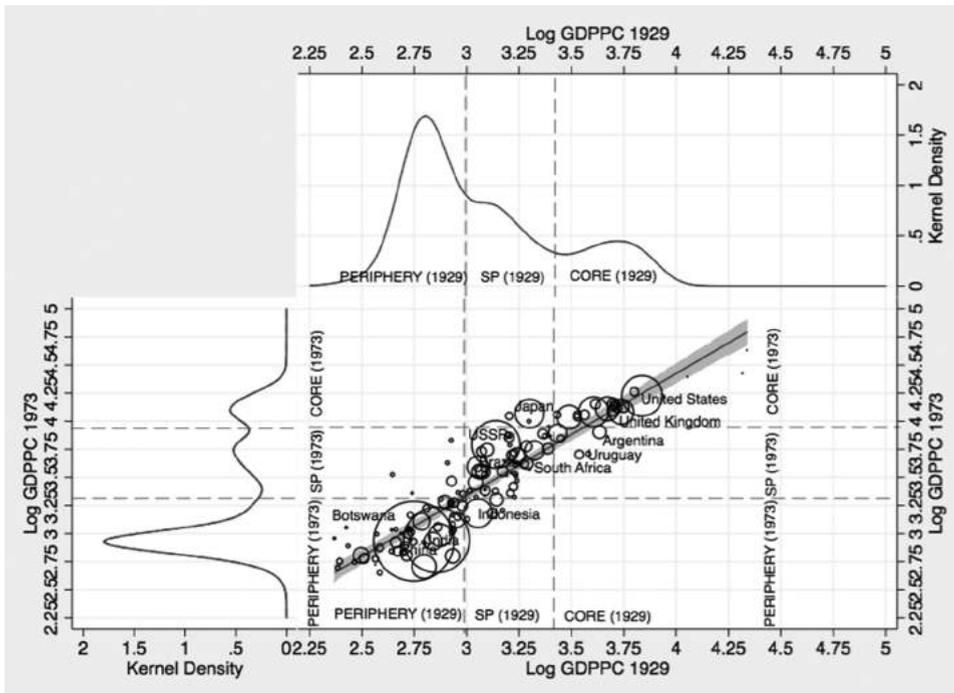


FIGURE 10. Rise of the US World Hegemony, 1929-1973

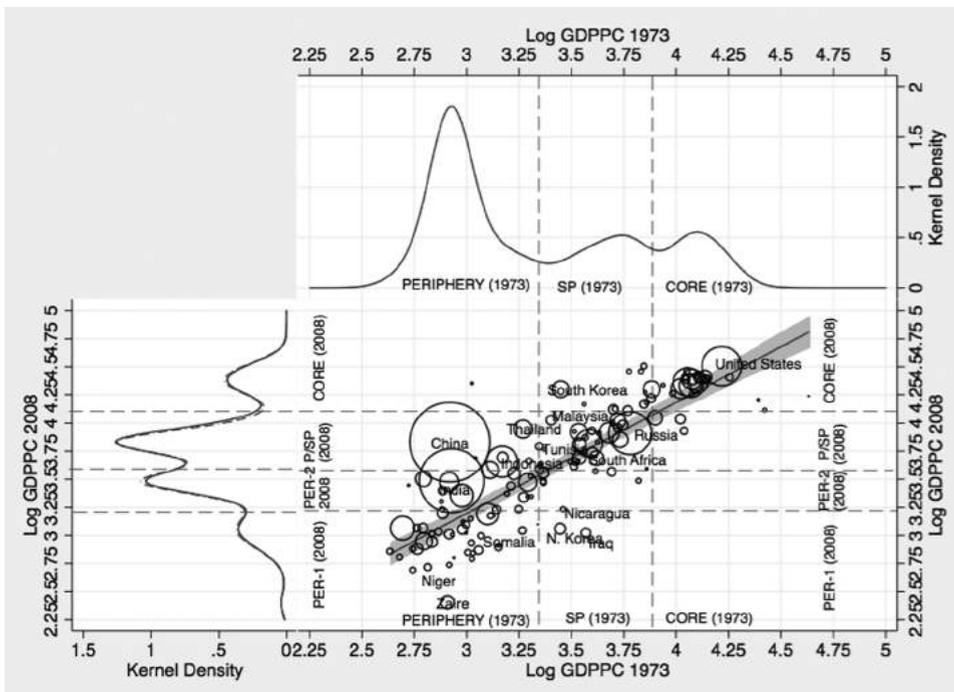


FIGURE 11. Crisis of the US World Hegemony, 1973-2008

To identify the periodization of world hegemonies and world hegemonic crises and transitions, we used Arrighi's (1994) notion of signal crisis and terminal crisis. We conceptualized "world hegemonies" as periods ranging from a terminal crisis of a world hegemony to a signal crisis of the next hegemony; "world hegemonic crisis and transition" are conceptualized as periods ranging from a signal crisis to a terminal crisis in each hegemony. Because we do not have full series for the Dutch hegemony, our estimates for that period are very approximate. We used 1873 (the beginning of the 1873 depression) as the beginning of the signal crisis of the British hegemony, 1929 as the terminal crisis of the British hegemony, 1973 as the signal crisis of the US hegemony, and 2007/8 as its terminal crisis.

As figure 6 shows, during the period of Dutch world hegemony (extending from the sixteenth century to the early eighteenth century), the distribution of wealth within the capitalist world-economy was unimodal according to the Arrighi-Drangel method. It is important to remember that the empirical unimodal distribution during this period does not mean that there was no significant difference in relative wealth levels of regions/countries in different structural positions of the world-economy. *It does mean that the distribution of the world population along the relative wealth continuum (and the relative mix of core- and periphery-type activities in the world division of labor) was not large enough to produce empirically visible and distinct clusters resembling the core-semiperiphery-periphery hierarchy of the twentieth century.* The *complex continuum* of wealth hierarchy from 1500 to 1700 does resemble Wallerstein's description of core, semiperipheral, and peripheral regions in this period. The declining center of the previous material expansion period (Italy, with a log-GDP per capita of 3 in 1500) and the rising hegemonic power of this era (the United Provinces, with a log-GDP per capita of 3.3 in 1700) are at the top of this hierarchy, constituting the outliers during this entire period. Most of western Europe (the United Kingdom, Belgium, Denmark, France, Germany, Spain, Switzerland, Sweden, Norway, and Portugal), some eastern European regions (Austria), and some Latin American regions (Argentina, Colombia, and Paraguay) are in the middle of this hierarchy. And Ireland, Finland, Poland, and rest of the American regions (that had already been incorporated into the capitalist world-economy) are at the bottom of this hierarchy. Yet clustering of the world population along this continuum is not sufficient to create distinct zones.⁵

As figure 7 illustrates, however, during the transition from the Dutch to British world hegemony, the global wealth hierarchy within the capitalist world-economy gradually moved from a unimodal to a bimodal distribution. The biggest roles in this transformation were played by the rise of the western Europe after the Industrial Revolution in Great Britain and the incorporation of new regions (the Ottoman Empire, Russia, the Indian subcontinent, and western Africa) from a categorically distinct (i.e., peripheral) position into the capitalist world-economy (see figure 8). Incorporation of these regions shifted "the mode" of global wealth distribution from 3.1 log-GDP per capita to 2.75. This was because, except for western African countries (whose log-GDP per capita was between 2 to 2.4), all of these newly incorporated regions had very high population levels and log-GDP per capita levels between 2.7 and 2.85 (e.g., Russia was 2.83, Turkey

and Greece were 2.80, the Balkan regions of the Ottoman Empire were 2.78, India was 2.73, and Sri Lanka was 2.74). With the rise of western Europe and some settler colonies of Great Britain after the Industrial Revolution, the second mode emerged, constituting the core regions at the 3.1 log-GDP per capita level.

This incorporation of external areas into the capitalist world-economy—which aimed to produce new markets, raw materials, and cheap labor—was not only a consequence of the Industrial Revolution but also a response to stagnating transatlantic trade and monetary inflation in the second half of the eighteenth century (Frank 1978:144–47; Hopkins et al. 1987:805–42; Wallerstein 1989:129). The second half of this period in particular was characterized by stagnating transatlantic trade, monetary inflation, and a shortage in world-economic supply due to the elimination of *direct links* between the colonial regions of America and the European powers on account of independence movements (e.g., independence of the Thirteen Colonies, the Haitian Revolution, and Latin American independence movements) (Wallerstein 1989:140). Incorporation of the India subcontinent, the Ottoman Empire, Russia, and coastal regions of western Africa from a peripheral position, the elimination/reduction of manufacturing activities in these regions, and the expansion of cash crop agriculture (and analogous activities)—coupled with (a) global relocation of productive activities from Holland to Great Britain and (b) the start of the Industrial Revolution in Great Britain and the consequent revolutionized production systems in western Europe—gradually clustered the world’s population into two major zones, producing a bimodal distribution.

As figure 8 shows, this bimodal distribution remained relatively stable from 1820 to 1873, and there was an extremely low level of mobility across zones during British world hegemony. The incorporation of China and other “external areas” of Asia into the capitalist world-economy in a peripheral position in the mid-nineteenth century and the emergence of British-led free trade imperialism further reinforced this relatively stable bimodal structure. As figure 9 reveals, however, the capitalist world-economy gradually moved from a bimodal to a trimodal distribution because of a depression in 1873 and later the Great Depression beginning in 1929, which mark the signal and terminal crises of the British world hegemony.

The transition from the British to the US world hegemony had similarities to as well as some major differences from the transition from the Dutch to the British world hegemony. While the incorporation of Africa—through a torrent of imperialist and territorial colonization—was a critical component of the crisis of the British world hegemony (analogous to the incorporation of the Ottoman Empire, the Indian subcontinent, Russia, and western Africa during the crisis of the Dutch hegemony), figure 9 suggests that the transition from a bimodal to a trimodal distribution is evident even when we exclude these newly incorporated African regions. The growth rates show that almost all regions/countries in the peripheral zone—most of them are peripheral regions of Asia such as China and subcontinental India—had significantly lower growth rates than the core and the emergent semiperipheral zone. This was because successive military campaigns in the nineteenth century led by the British Empire aiming to incorporate subcontinental India as well as the China centered world-system into the European centered capitalist world-economy ended

up disarticulating the Asian “super-world-economy” (Braudel 1984:484) together with transnational production and trade networks—extending from the Arabian peninsula to China—that sustained it (Arrighi, Ahmad, and Shih 1999:227–37), making these regions more vulnerable to the polarizing and exploitative dynamics of the capitalist world-economy.

This finding suggests that during the crisis of the British world hegemony (between 1873 and 1929), polarizing and exploitative dynamics of the capitalist world-economy—combined with imperialist territorial occupation—split in two the former peripheral zone. This bifurcation created a downwardly mobile, superexploited world region (the emergent periphery) and another zone that escaped this fate by managing to occupy an intermediate position (the emergent semiperiphery). Analogous to the transition from the Dutch to the British world hegemony, global relocation of capital and productive activities, this time from the United Kingdom to the United States (and Germany), initiated the so-called Second Industrial Revolution, which led to a new round of imperialist expansion among both old and new imperial powers. The combination of these processes produced the Great Divergence between the East and the West. As summarized by Frank (2015:55), the Great Divergence occurred when the Eastern regions of the world-economy declined after the 1870s while the Western regions rose because of the Second Industrial Revolution (led by Germany and the United States after 1870) and imperialism. Regions that were strong enough to avoid territorial/imperial occupation and superexploitation but not strong enough to be leading sectors of the world-economy became the semiperipheral regions of the twentieth century.

As in previous periods of world hegemonies, the three-tiered global wealth hierarchy during the period of US world hegemony remained relatively stable from 1929 to 1973. As the scatterplot in figure 10 shows, there was not much upward or downward mobility across zones of the capitalist world-system during this period, as was argued by the original Arrighi and Drangel (1986) study. Likewise the few exceptions—the “miracles” of some East Asian countries such as Japan and South Korea after the Second World War, the rise of Israel in the 1960s, or the upward mobility of oil-rich countries such as Oman, Libya, and Saudi Arabia—were not weighty enough to transform the existing trimodal global wealth structure. But the same cannot be said for the crisis period of US hegemony, in which the global wealth distribution is moving from a trimodal to a new quadrimodal distribution.

The dynamics of the crisis of US hegemony are radically different from those of its predecessors. First, the capitalist world-economy can no longer expand in space to solve systemic crises, since it has already incorporated all world regions. Second, the transformation dynamics are occurring because of the upward mobility of a major section of the periphery to a semiperipheral position. This is because in the current crisis, unlike previous periods of hegemonic crisis—where excess global capital moved from core countries to other core countries or to rising semiperipheral countries—global capital and productive activities have been relocating from core countries of North America and western Europe (and even semiperipheral countries) to the peripheral regions of Asia (such as China and India), which operate in a wider network of trade and production in the global South.

As figure 11 shows, while the upward mobility of China and India play a major role in the creation of two new distinct zones, many other countries are also upwardly mobile. Like China, countries such as Egypt, Botswana, Indonesia, Morocco, Sri Lanka, and Thailand have managed to move to this new semiperipheral (P/SP) position. In terms of their GDP per capita (in PPP), these countries are now in the same zone as former semiperipheral countries such as Brazil, Colombia, Cuba, Ecuador, Guatemala, Iran, Jordan, Malaysia, Mexico, Peru, Poland, Romania, South Africa, Syria, Tunisia, and Turkey. And like India, many other peripheral countries—including Burma, Cambodia, Cape Verde, Congo, Honduras, Lesotho, Mozambique, Pakistan, the Philippines, Vietnam, and Yemen—now constitute the upper peripheral (P₂) zone. In terms of the GDP per capita level, this upper periphery is a completely different cluster from the lower peripheral zone (P₁), which consists of countries such as Afghanistan, Angola, Bangladesh, Cameroon, Chad, Côte d’Ivoire, Eritrea, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mali, Nepal, Niger, Nigeria, Rwanda, Senegal, Sudan, Tanzania, Uganda, Zaire, Zambia, and Zimbabwe. Precisely because of these major changes, what we have been observing in the early twenty-first century cannot be seen as another example of upward mobility as usual. As Ravi Palat (2012) observed:

Virtually every decade since the end of the Second World War appears to throw up an economic “miracle”: Italy and Japan in the 1950s, Israel in the 1960s, Brazil, Mexico, and other “newly-industrializing countries” in the 1970s, the “four dragons” in the 1980s, the Celtic Tiger in the 1990s. Miraculous as they may have appeared to contemporaries, none of these economic wonders seriously threatened to fundamentally transform the global hierarchy of wealth—and in some cases, they fizzled out as rapidly as they had risen. (p. 142)

Yet the advance of regions with huge populations, such as China and India, joined by a wider set of countries from the periphery, to different intermediate positions of the world-economy has actually been transforming this global hierarchy of wealth. Hence, we gradually see the emergence of a quadrimodal hierarchical structure with four tiers in the early twenty-first century.

CONCLUSION

It is not surprising that some scholars have interpreted the recent rise of peripheral regions and the transformation of the global wealth hierarchy as evidence for modernization theory. Nonetheless, the analysis presented in this article demonstrates that these transformations are not in line with the expectations of modernization theorists for two reasons. First of all, these upwardly mobile peripheral countries have not caught up with the core. Some of them have barely caught up with the semiperiphery, and some of them occupy an intermediate position between the former periphery and semiperiphery, creating a new cluster I call the upper periphery. Second, a major cluster of the periphery (the lower periphery) is actually falling further behind. Thus it might be more appropriate to describe these trajectories as a restructuring of and a bifurcation within the noncore positions, rather than a “catching-up” process as described by modernization theory.

These recent transformations cannot properly be explained by the dependency theory either. Instead of a further polarization between core and peripheral regions, we have seen the

emergence of new clusters in intermediate positions in the global hierarchy of wealth. In contrast to the relatively stable trimodal distribution hypothesis suggested by the traditional world-systems theory, the emerging distribution of wealth is departing from the neat three-tiered structure of the twentieth century. What we are now observing is the emergence of a new quadrimodal distribution of the global wealth hierarchy.

The analysis presented in this paper suggests that transformations of global hierarchies of wealth—such as the one we see today—have been a recurrent tendency of the capitalist world-economy, which survives crises through transformation of its operations. Global hierarchies of wealth within the capitalist world-economy have been characterized by punctuated equilibria and movement to a new equilibrium during periods of crisis. Hence, the radical transformations of recent decades do not necessarily mark the end of the capitalist world-system as we know it. On the contrary, they signal that we are living in another historical conjuncture characterized by a systemic crisis—a fundamental restructuring of the capitalist world-system has been taking place before our eyes.

Of course, since these transformations are still ongoing, it is difficult to say whether this quadrimodal pattern will stabilize in the twenty-first century or whether these rising countries will catch up with the core in the near future. I do not believe it is possible to predict the near future by extrapolating the growth levels of all countries of the world during the last couple of years. Looking at the previous long-historical trends, however, we can say that the key transformations from one global hierarchy of wealth to another have taken place between the signal and terminal crises of each world hegemonic period. In the previous century, for instance, the trimodal distribution started to emerge after the 1873 depression, and it was already stable when the Great Depression (i.e., the terminal crisis of the British systemic cycle) began in 1929. Likewise in this century, a quadrimodal distribution started to emerge between the signal crisis of the US world hegemony (the 1968 crisis), accelerated during the 1990s, and began stabilizing after the 2007–8 financial crisis. While it is still too early to tell, if trends continue to evolve the way they did in previous analogous periods, we are not likely to see a unimodal or normal distribution (as expected by modernization theory). Rather, we will probably see a relatively stable quadrimodal distribution in the early twenty-first century. A catching-up process where a majority of the world population reaches the standards of wealth enjoyed by core countries and produces a unimodal distribution—as expected by modernization theory—seems neither likely nor sustainable. Sustaining the standards of wealth for just 15 percent of the population currently residing in core locations has led to the destruction of livelihoods of the vast majority of the working classes and of the environment in a catastrophic and irreversible way. The world's human and environmental resources cannot possibly sustain this generalized “catching-up” process. A unimodal distribution of wealth can be achieved only if core countries move down in the global wealth hierarchy by deaccumulating capital while the rest of the world tries to emulate the core countries' path of ascension. This, however, is not feasible because of the polarizing tendencies of capitalism as well as geopolitical conflicts it would generate.

To be able to predict the global wealth hierarchy of the near future more accurately, we must go beyond the preliminary framework and analysis presented in this article. Additional research must examine the evolution of the formation and transformation of each “mode” of the capitalist world-economy in its historical relationship with world-level economic and geopolitical processes. Further research must also take into account the dialectical relationship between the transformation of class relationships within each state/region (as well as geographical polarization within these countries/regions) and the restructuring of global hierarchies of wealth. After all, transforming global hierarchies of wealth is only one of the ways through which the capitalist world-system restructures itself during periods of intensified systemic crisis. A framework that incorporates these aspects, aided by more rigorous data and evidence, may unearth some of the structural dynamics of how capitalism has transformed over time, as well as the recurrent and anomalous features of this long-historical transformation. ■

APPENDIX

The analysis presented in this article used (a) log-transformation for GDP per capita values, (b) kernel density analysis with a fixed bandwidth of 0.10, and (c) a changing number of countries/regions because of the expansion of the capitalist world-economy over the *longue durée*. Because this analysis includes many moving parts, figures A1 through A5 present population-weighted GDP per capita data, post-log transformation data, and kernel densities of these transformed data with smaller bandwidths ($h = 0.10$, $h = 0.05$ and $h = 0.025$), using all countries/regions in the database for selected years.

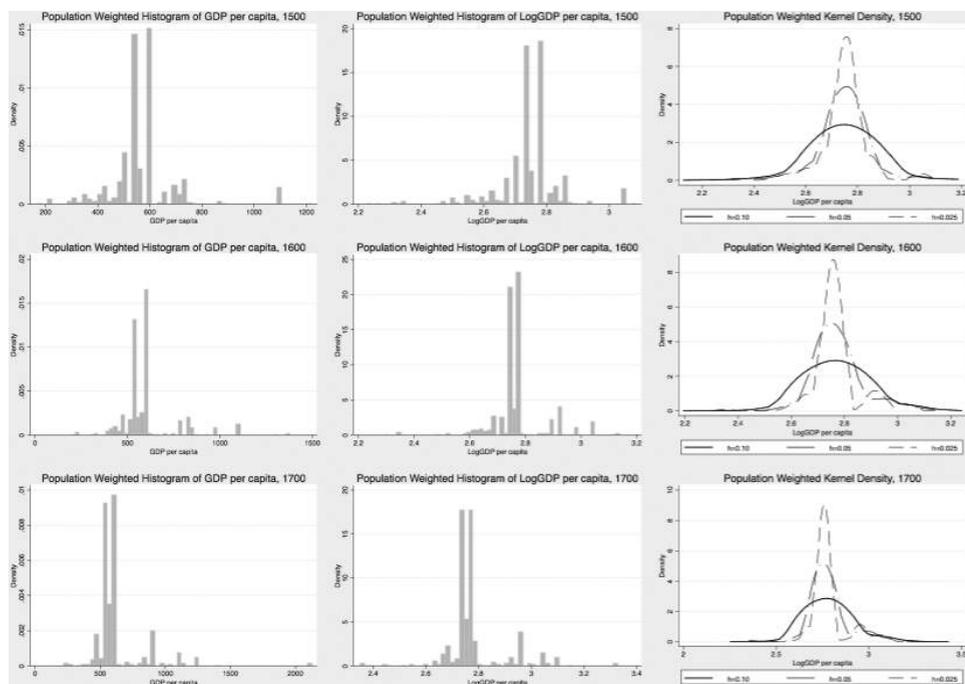


FIGURE A1. Histogram, Log Transformation, and Kernel Densities for Years 1500, 1600, and 1700

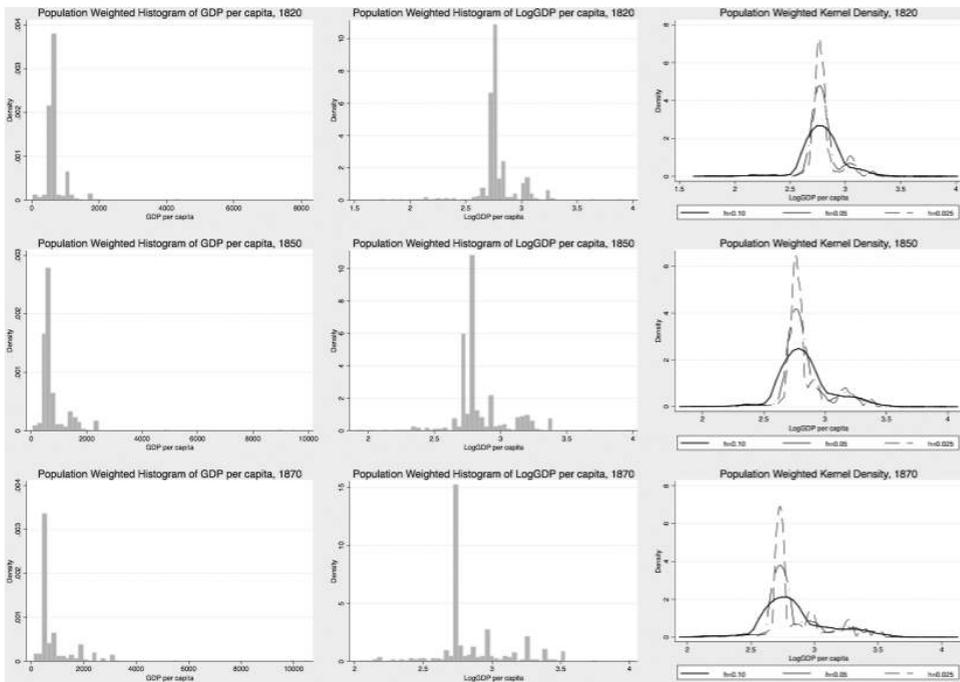


FIGURE A2. Histogram, Log Transformation, and Kernel Densities for Years 1820, 1840, and 1860

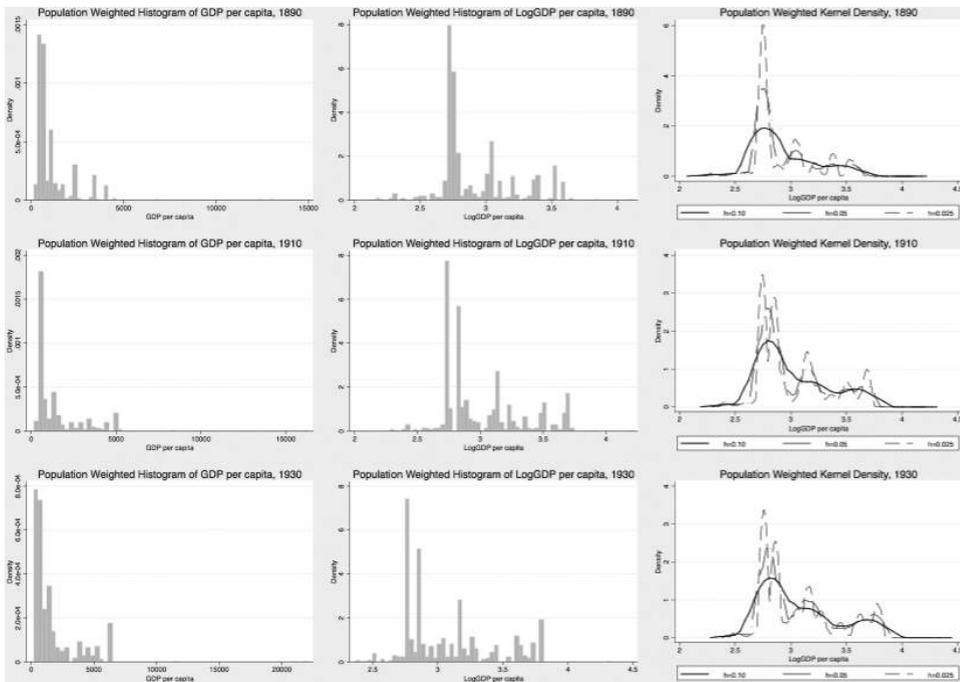


FIGURE A3. Histogram, Log Transformation, and Kernel Densities for Years 1890, 1910, and 1930

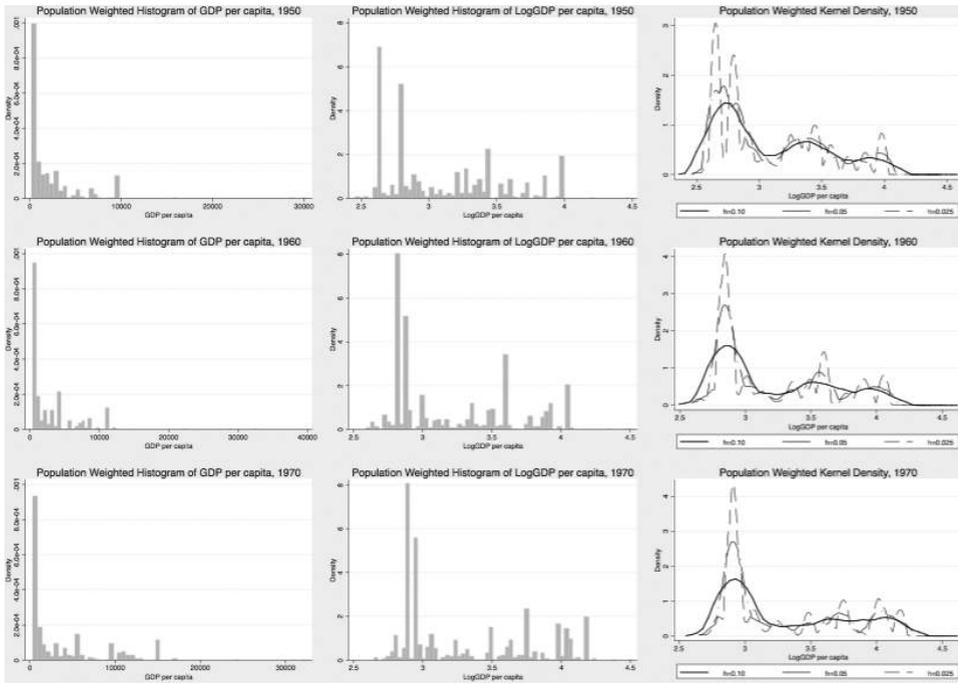


FIGURE A4. Histogram, Log Transformation, and Kernel Densities for Years 1950, 1960, and 1970

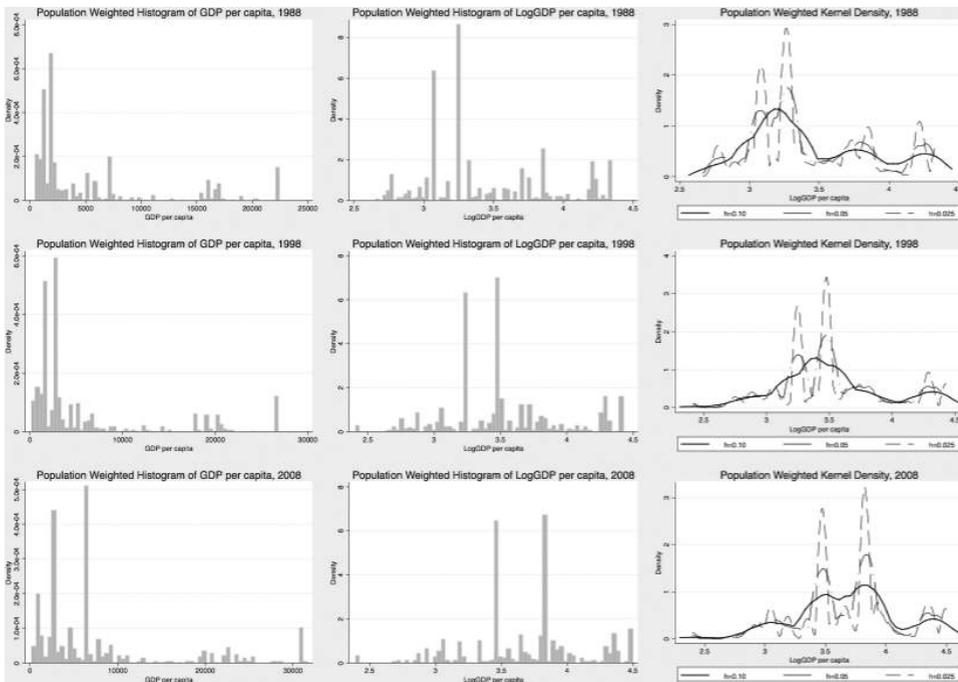


FIGURE A5. Histogram, Log Transformation, and Kernel Densities for Years 1988, 1998, and 2008

REFERENCES

- Abu-Lughod, Janet. 1989. *Before European Hegemony: The World System A.D. 1250–1350*. Oxford: Oxford University Press.
- Alexander, Jeffrey. 1995. "Modern, Anti, Post and Neo." *New Left Review* 210(1):62–101.
- Amin, Samir. 1974. *Accumulation on a World-scale*. New York: Monthly Review Press.
- Arrighi, Giovanni. 1990. "The Developmentalist Illusion: A Reconceptualization of the Semiperiphery." Pp. 11–42 in *Semiperipheral States in the World-economy*, edited by W. G. Martin. Westport, CT: Greenwood Press.
- Arrighi, Giovanni. 1994. *The Long Twentieth Century: Money, Power, and the Origins of Our Times*. London: Verso.
- Arrighi, Giovanni. 1999. "Globalization and Historical Macrosociology." Pp. 117–33 in *Sociology for the Twenty-first Century: Continuities and Cutting Edges*, edited by Janet L. Abu-Lughod. Chicago: University of Chicago Press.
- Arrighi, Giovanni, Iftikhar Ahmad, and Miin-wen Shih. 1999. "Western Hegemonies in World-historical Perspective." Pp. 217–70 in *Chaos and Governance in the Modern World-system*, edited by Giovanni Arrighi and Beverly Silver. Minnesota: Minnesota University Press.
- Arrighi, Giovanni, and Jessica Drangel. 1986. "Stratification of the World-economy: An Exploration of the Semiperipheral Zone." *Review (Fernand Braudel Center)* 10(1):9–74.
- Arrighi, Giovanni, Roberto Patricio Korzeniewicz, David Consiglio, and Timothy P. Moran. 1996. "Modeling Zones of the World-economy: A Polynomial Regression Analysis (1964–1994)." Paper presented at the 1996 Annual Meeting of the American Sociological Association, New York City.
- Arrighi, Giovanni, and Beverly Silver. 1999. *Chaos and Governance in the Modern World-system*. Minnesota: Minnesota University Press.
- Arrighi, Giovanni, Beverly Silver, and Benjamin Brewer. 2003. "Industrial Convergence and the Persistence of the North-South Divide: A Rejoinder." *Studies in Comparative International Development* 38(1):3–31
- Aymard, Maurice. 1985. "Nation-states and Interregional Disparities of Development." Pp. 40–54 in *Semiperipheral Development: The Politics of Southern Europe in the Twentieth Century*, edited by Giovanni Arrighi. Beverly Hills, CA: Sage Publications.
- Babones, Salvatore J. 2005. "The Country-level Income Structure of the World-economy." *Journal of World-systems Research* 11(1):29–55.
- Bianchi, Marco. 1997. "Testing for Convergence: Evidence From Non-parametric Multimodality Tests." *Journal of Applied Econometrics* 12:393–409.
- Block, Fred. 2000. "Deconstructing Capitalism as a System." *Rethinking Marxism* 12(3):83–98.
- Bollen, Kenneth A. 1983. "World System Position, Dependency and Democracy: The Cross-national Evidence." *American Sociological Review* 48:468–79.
- Bollen, Kenneth A., and Stephen J. Appold. 1993. "National Industrial Structure and the Global System." *American Sociological Review* 58:283–301.
- Bourguignon, François, and Christian Morrisson. 2002. "Inequality among World Citizens: 1820–1992." *American Economic Review* 94(2):727–44.
- Braudel, Fernand. 1984. *Civilization and Capitalism, Fifteenth-eighteenth Century*. Vol. 3. *The Perspective of the World*. New York: Harper and Row.
- Cardoso, Fernando H., and Enzo Faletto. 1979. *Dependency and Development in Latin America*. Berkeley: University of California Press.
- Chase-Dunn, Christopher. 1998. *Global Formation: Structures of the World-economy*. Lanham, MD: Rowman and Littlefield.
- Chase-Dunn, Christopher. 2005. "Social Evolution and the Future of World Society." *Journal of World-systems Research* 11(2):171–92.
- Chase-Dunn, Christopher, and Hiroko Inoue. 2012. "Accelerating Democratic Global State Formation." *Cooperation and Conflict* 47(2):157–75.

- Chase-Dunn, Christopher, Andrew K. Jorgenson, Thomas E. Reifer, and Shoon Lio. 2005. "The Trajectories of the United States in the World-system: A Quantitative Reflection." *Sociological Perspectives* 48(2):233–54.
- Chase-Dunn, Christopher, Yukio Kawano, and Benjamin D. Brewer. 2000. "Trade Globalization since 1795: Waves of Integration in the World-system." *American Sociological Review* 65(1):77–95.
- Chase-Dunn, Christopher, and Richard Rubinson. 1977. "Toward a Structural Perspective on the World-system." *Politics and Society* 7(4):453–76.
- Clark, Rob, and Jason Beckfield. 2009. "A New Trichotomous Measure of World-system Position Using the International Trade Network." *International Journal of Comparative Sociology* 50(1): 5–39.
- Evans, Peter. 1979. *Dependent Development*. Princeton, NJ: Princeton University Press.
- Firebaugh, Glenn. 2000. "The Trend in Between-nation Income Inequality." *Annual Review of Sociology* 26:333–34.
- Frank, Andre Gunder. 1967. *Capitalism and Underdevelopment in Latin America: Historical Studies of Chile and Brazil*. New York: Monthly Review Press.
- Frank, Andre Gunder. 1978. *World Accumulation, 1492–1798*. New York: Monthly Review Press.
- Frank, Andre Gunder. 2015. *Reorienting the 19th Century: Global Economy in the Continuing Asian Age*. Edited by Robert A. Denemark. Boulder, CO: Paradigm.
- Hechter, Michael. 1975. "Review Essay on the Modern World-system." *Contemporary Sociology* 4:217–22.
- Heller, Patrick, Dietrich Rueschemeyer, and Richard Snyder. 2009. "Dependency and Development in a Globalized World: Looking Back and Forward." *Studies in Comparative International Development* 44(4):287–95.
- Hobsbawm, Eric. 1994. *The Age of Extremes: The Short 20th Century, 1914–1991*. London: Abacus.
- Hopkins, Terence K., and Immanuel Wallerstein. 1977. "Patterns of Development of the Modern World-system." *Review (Fernand Braudel Center)* 1(2):111–45.
- Hopkins, Terence K., and Immanuel Wallerstein. 1982. *World-systems Analysis: Theory and Methodology*. Vol. 1. Beverly Hills, CA: Sage Publications.
- Hopkins, Terence K., Immanuel Wallerstein, Resat Kasaba, William G. Martin, and Peter K. Philips. 1987. "Incorporation into the World-economy: How the World-system Expands." *Review (Fernand Braudel Center)* 10(5/6):761–902.
- Hung, Ho-fung, and Jaime Kucinskas. 2011. "Globalization and Global Inequality: Assessing the Impact of the Rise of China and India, 1980–2005." *American Journal of Sociology* 116(5): 1478–1513.
- Jerven, Morten. 2012. "An Unlevel Playing Field: National Income Estimates and Reciprocal Comparison in Global Economic History." *Journal of Global History* 7:107–28.
- Jorgenson, Andrew K. 2006. "Unequal Ecological Exchange and Environmental Degradation: A Theoretical Proposition and Cross-national Study of Deforestation, 1990–2000." *Rural Sociology* 71:685–712.
- Kentor, Jeffrey. 1998. "The Long-term Effects of Foreign Investment Dependence on Economic Growth." *American Journal of Sociology* 103(4):1024–46.
- Kentor, Jeffrey. 2000. *Capital and Coercion: The Economic and Military Processes That Have Shaped the World Economy, 1800–1990*. New York: Garland.
- Korzeniewicz, Roberto Patricio, and William G. Martin. 1994. "The Global Distribution of Commodity Chains." Pp. 67–91 in *Commodity Chains and Global Capitalism*, edited by Gary Gereffi and Miguel Korzeniewicz. Westport, CT: Praeger.
- Korzeniewicz, Roberto Patricio, and Timothy P. Moran. 1997. "World-economic Trends in the Distribution of Income, 1965–1992." *American Journal of Sociology* 102(4):1000–1039.
- Korzeniewicz, Roberto Patricio, and Timothy P. Moran. 2009. *Unveiling Inequality: A World-historical Perspective*. New York: Russell Sage Foundation.

- Kwon, Roy. 2011. "Hegemonies in the World-system: An Empirical Assessment of Hegemonic Sequences from the 16th to 20th Century." *Sociological Perspectives* 54(4):593–617.
- Lee, Kwangkun. 2009. "Towards a Reformulation of Core/Periphery Relationship: A Critical Reappraisal of the Trimodality of the Capitalist World-economy in the Early 21st Century." *Perspectives on Global Development and Technology* 8:263–94.
- Li, Minqi. 2008. *The Rise of China and the Demise of the Capitalist World-economy*. London: Pluto Press.
- Limburg, Karin E., Robert V. O'Neill, Robert Costanza, and Stephen Farber. 2002. "Complex Systems and Valuation." *Ecological Economics* 41:409–20.
- Mahutga, Matthew C. 2006. "The Persistence of Structural Inequality? A Network Analysis of International Trade, 1965–2000." *Social Forces* 84(4):1863–89.
- Marx, Karl. [1867] 1992. *Capital: A Critique of Political Economy*. Translated by Samuel Moore and Edward Aveling. Vol. 1. New York: International Publishers.
- Milanovic, Branko. 2013. "Global Income Inequality in Numbers: In History and Now." *Global Policy* 4(2):198–208.
- Milkman, Ruth. 1979. "Contradictions of Semi-peripheral Development: The South African Case." Pp. 261–84 in *The World System of Capitalism, Past and Present*, edited by Walter L. Goldfrank. Beverly Hills, CA: Sage Publications.
- Mitchell, Melanie. 2009. *Complexity: A Guided Tour*. Oxford: Oxford University Press.
- Muller, Edward N. 1988. "Democracy, Economic Development and Income Inequality." *American Sociological Review* 53:50–68.
- Muller, Edward N. 1995. "Economic Determinants of Democracy." *American Sociological Review* 60:966–82.
- Nemeth, Roger J., and David A. Smith. 1985. "International Trade and World-system Structure: A Multiple Network Analysis." *Review (Fernand Braudel Center)* 8(4):517–60.
- Palat, Ravi Arvind. 2012. "Much Ado about Nothing? World-historical Implications of the Re-emergence of China and India." *International Critical Thought* 2(2):139–55.
- Pieterse, Jan Nederveen. 1988. "A Critique of World System Theory." *International Sociology* 3(2): 251–66.
- Piketty, Thomas. 2014. *Capital in the Twenty-first Century*. Cambridge, MA: Harvard University Press.
- Rau, William, and Dennis W. Roncek. 1987. "Industrialization and World-inequality: The Transformation of the Division of Labor in 59 Nations, 1960–1981." *American Sociological Review* 52:359–69.
- Rostow, Walt W. 1960. *The Stages of Economic Growth: A Non-communist Manifesto*. Cambridge: Cambridge University Press.
- Sala-i-Martin, Xavier. 2006. "World Distribution of Income: Falling Poverty and . . . Convergence, Period." *Quarterly Journal of Economics* 121(2):351–97.
- Sanderson, Stephen K. 2005. "World-systems Analysis after Thirty Years: Should It Rest in Peace?" *International Journal of Comparative Sociology* 46(3):186–87.
- Schumpeter, Joseph A. 2003. *Capitalism, Socialism and Democracy*. New York: Routledge.
- Shafer, Michael D. 1994. *Winners and Losers: How Sectors Shape the Developmental Prospects of States*. Ithaca, NY: Cornell University Press.
- Silver, Beverly J. 2003. *Forces of Labor: Workers' Movements and Globalization since 1870*. Cambridge: Cambridge University Press.
- Silver, Beverly J., and Giovanni Arrighi. 2003. "Polanyi's 'Double Movement': The *Belle Époques* of British and U.S. Hegemony Compared." *Politics and Society* 31(2):325–55.
- Silver, Beverly J., and Şahan Savaş Karataşlı. 2015. "Historical Dynamics of Capitalism and Labor Movements." Pp. 133–45 in *The Oxford Handbook of Social Movements*, edited by Donatella della Porta and Mario Diani. Oxford: Oxford University Press.
- Silver, Beverly J., and Eric Slater. 1999. "The Social Origins of World Hegemonies." Pp. 151–216 in *Chaos and Governance in the Modern World-system*, edited by Giovanni Arrighi and Beverly Silver. Minneapolis: University of Minnesota Press.

- Snyder, David, and Edward L. Kick. 1979. "Structural Position in the World-system and Economic Growth, 1955–1970: A Multiple-network Analysis of Transnational Interactions." *American Journal of Sociology* 84:1096–1126.
- Taylor, Peter J. 1988. "Alternative Geography: A Supportive Note on Arrighi and Drangel." *Review (Fernand Braudel Center)* 11(4):569–79.
- Terlouw, Cornelius P. 1993. "The Elusive Semiperiphery: A Critical Examination of the Concept of Semiperiphery." *International Journal of Comparative Sociology* 34:87–102.
- Van Rossem, R. 1996. "The World System Paradigm as General Theory of Development: A Cross-national Test." *American Sociological Review* 61:508–28.
- Wade, Robert H. 2004. "Is Globalization Reducing Poverty and Inequality." *World Development* 32(4):567–89.
- Wallerstein, Immanuel. 1974. *The Modern World-system*. Vol. 1. *Capitalist Agriculture and the Origins of the European World-economy in the Sixteenth Century*. New York: Academic Press.
- Wallerstein, Immanuel. 1975. "Class Formation in the Capitalist World-economy." *Politics and Society* 5(3):367–75.
- Wallerstein, Immanuel. 1979. *The Capitalist World-economy*. New York: Cambridge University Press.
- Wallerstein, Immanuel. 1989. *The Modern World-system*. Vol. 3. *The Second Era of Great Expansion of the Capitalist World-economy, 1730–1840s*. New York: Academic Press
- Wallerstein, Immanuel. 2004. *World-systems Analysis: An Introduction*. Durham, NC: Duke University Press.
- Wallerstein, Immanuel. 2005. "After Developmentalism and Globalization, What?" *Social Forces* 83(3):1263–78.
- Wimmer, Andreas, and Brian Min. 2006. "From Empire to Nation-state: Explaining Wars in the Modern World: 1816–2001." *American Sociological Review* 71(6):867–97.
- Wimmer, Andreas, and Nina Glick Schiller. 2002. "Methodological Nationalism and Beyond: Nation-state Formation, Migration and the Social Sciences." *Global Networks* 2:301–34.
- Wright, Erik Olin. 1978. *Class, Crisis and the State*. London: NLB.

NOTES

Earlier versions of this research—coauthored with Sefika Kumral—were presented at the Fourth Annual Conference of the Sociology of Development Section of the American Sociological Association (ASA), the 86th Annual Meeting of the Eastern Sociological Society, the 40th Annual Meeting of the Social Science History Association, and the 40th Conference of the Political Economy of the World-System Section of the ASA. For comments on this research I would like to thank Sefika Kumral, Phillip Hough, Beverly Silver, Ho-fung Hung, Daniel Pasciuti, Corey Payne, Kevan Harris, Astra Bonini, Patricio Korzeniewicz, Samuel Cohn, and anonymous reviewers and editors of *Sociology of Development*.

1. For how semiperipheral positions are constantly recreated during periods of crisis, see Hopkins et al. (1987:773–74).

2. Considering the fact that the differences between PPP and market exchange rate conversions will be more prominent in recent decades, I conducted the analysis presented in this paper from 1970 to 2012 using the GNI per capita and GDP per capita values estimated by the World Bank, which rely on constant and current USD conversions. These replications showed that, while the rise of China and other peripheral countries in the post-1990 period was relatively more modest in comparison to Maddison's PPP data, there was no major difference that would alter the main findings presented in this paper. In all replications, the existing trimodal distribution started to break down in the post-1990 period.

3. The analysis presented in the article used fixed bandwidths for examining zones of the capitalist world-economy in the *longue durée*. The use of a fixed bandwidth aims to make sure that (a) we do

not deviate from the original Arrighi-Drangel method too much and (b) the patterns we observe are not due to changes in the bandwidths used. In the preliminary analysis, I also used *dynamic* bandwidths that change in relation to the size of the world population and the number of countries in the analysis. Although we do not have the space to present these findings, it will suffice to say that the main conclusions of this paper (i.e., stability of zones during periods of world hegemony and their transformation during periods of world hegemonic crises) are not due to the bandwidths chosen. While smaller bandwidths produce a more sensitive analysis and produce more clusters for all periods, size and numbers of these clusters also increase from one world hegemony to the next. Although a fixed bandwidth of 0.10 will be ideal for replicating the Arrighi-Drangel method, for the sake of convenience, in the Appendix I also show kernel density graphs with multiple smaller bandwidths (0.05 and 0.025) together with the raw data (both logged and unlogged) for selective years. Also in the findings section, I present the population-weighted scatterplots that will give an idea about the distribution of the world population along the log-GDP per capita axis—as well as emerging clusters—regardless of the bandwidths used.

4. The dashed lines that connect the years 1500, 1600, 1700 and 1820 show the periods for which the Maddison Tables do not have any estimations. Only from 1820 onwards do we have a full series of data.

5. They merely produce a small bump at the lower tail of the distribution, which does not constitute a “mode” according to our methodology. If we depart from our Arrighi-Drangel methodology (which aims to identify empirically distinct clusters rather than to divide a continuum using cutoff points chosen by the researcher), we can still superimpose the “core,” “semiperiphery,” and “periphery” categories onto these different positions. However, this strategy—which aims to reconcile our unimodal distribution with Wallerstein’s categories—will produce a hierarchical structure with a *massive* semiperiphery at the middle (constituting the mode) and much smaller peripheral and core regions at the two ends, rather than a major periphery, a small semiperiphery, and a much smaller core.