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Authors

Chase-Dunn, Chris
Manning, Susan

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City systems and world-systems:

Four millennia of city growth

and decline

Christopher Chase-Dunn

Institute for Research on World-Systems

University of California, Riverside

chriscd@mail.ucr.edu

Susan Manning

Sociology, Hofstra University

Abstract:

This is a study of the growth of cities in four regions over the past 4000 years. We discuss changes in the relationship between political/military power, economic power and city systems with special attention to the rise of European hegemony and the subsequent rise of East Asian world cities. We compare East Asian urban growth with the original heartland of cities in West Asia and North Africa, as well as Europe and the subcontinent of South Asia. This reveals the trajectories of city growth and decline and the relative importance of the different regions over time. And we re-examine the hypothesis of synchronicities of city growth and decline across distant regions as the Afro-eurasian world-system became more and more integrated.
V.5-14-02 (6339 words). Forthcoming in *Cross-Cultural Research*

The comparative study of settlement systems is an important basis of our understanding of human social evolution. The processes by which a world inhabited by small nomadic hunter-gatherer bands became the single global political economy of today involved the growth of settlement sizes

and the expansion of interaction networks. These processes of growth and expansion were uneven in time and space.Settlements and cities did not always get larger. There were cycles of growth and decline. And those regions that originally developed larger settlements and cities were, in later epochs, no longer the leading regions in terms of the sizes of their largest cities.

Our earlier studies have used data on both city sizes and the territorial sizes of empires to examine different regional interaction systems and the hypothesis that regions distant from one another were experiencing synchronous cycles of growth and decline (e.g. Chase-Dunn and Willard 1993; Chase-Dunn, Manning and Hall 2000).Our early study of city-size distributions in Afro-Eurasia (Chase-Dunn and Willard 1993; Chase-Dunn and Hall 1997: 222-223) found an apparent synchronicity between changes in city size distributions and the growth of largest cities in East Asia and West Asia-North Africa over a period of 2000 years.That led us to examine data on the territorial size of empires for similar synchronicity, which we found (Chase-Dunn, Manning and Hall 1999). This article is a re-examination of the city size data which will enable us to address claims about the relative importance of China in the Afro-eurasian system that have been advanced by Andre Gunder Frank (1998), and to more thoroughly examine the synchronicity hypothesis regarding city growth.

The relationship between power and demography has changed in important ways over the last 4000 years. Archaeologists sometimes assume a direct correspondence between population density and societal power in intersocietal interactions, and they also suppose that the settlement size hierarchy indicates stratification within a polity (e.g. Kowalewski 1982).

The relationship between stratification and the sizes of settlements needs to be considered both within societies and between them.It is generally assumed that societies that have larger cities will also have greater power than societies with smaller cities, and it is similarly assumed that a society that is internally more stratified will have a steeper city-size distribution – the relative population size of settlements within the society.

Though there was never a simple correlation between population density and the relative power of

societies *vis a vis* each other, there has been a rough correspondence between these.Societies that could concentrate greater numbers of people generally had an advantage in warfare. Exceptions to this have been semiperipheral marcher chiefdoms and semiperipheral marcher states that conquered older core powers (Chase-Dunn and Hall 1997: Chapter 4). These less dense, typically less hierarchical and upwardly mobile semiperipheral polities used geopolitical advantages, as well as superior organizational and military techniques, to defeat older core societies and to form larger regional polities.But it was still usually the case that societies with greater numbers of people and with larger cities had greater power over other societies than those with lower population densities and smaller settlements.

In the modern world-system the relationship between population density and power has become even more complicated.While it is still true that the existence of large cities indicates the ability of a society to produce and acquire the great resources necessary to support huge populations living densely, the largest cities are even less likely than before to be in the most powerful countries.As of 1985, Mexico City became the second largest urban agglomeration on Earth, and Sao Paolo was then the fourth largest (Chase-Dunn1985).

Power among societies is now much more directly a function of technology than it has been in the past. Machines controlled by a few people are capable of exercising power over great distances, and huge bodies of armed men are much less important than they have been in the past. Also economic power based on the ability to produce profitable high technology commodities and to control financial resources has become a much more important source of power than it was in the systems of the tributary empires. In tributary empires military power was itself predominant, and it was greatly dependent on the ability to mobilize and supply large armies.We would not argue that economic power has replaced military power, but only that economic power has become a much more important basis of predominance in the modern capitalist world-system than in earlier tributary systems.Economic power also has a demographic basis, and population density can be an advantage, but it is an advantage that is more strongly conditioned by technology and

organizational features than ever before.[1]

The problem of synchronicity – changes of important social structural features that are simultaneous -- is germane to our understanding of the emergence of the modern world-system out of the formerly separate regional systems.It is plausible that synchronous processes in distant locations indicate systemness – the interaction of important processes that are influencing local developmental. The emergence of an integrated global system has been a long-term process that has been characterized by pulsation cycles – the expansion and contraction of interaction networks (Chase-Dunn and Hall 1997).Long-distance trade and long-distance military campaigns have expanded and then contracted, but the long-term trend has been greater and greater integration of larger and larger territories.After our re-examination of city synchronicity we will discuss possible causal explanations for synchronicity in the Afroeurasian world-system.

The questions we will try to answer in this article are:

1. what can patterns of urban growth and decline tell us about the relative trajectories of development and the relationships among different regions in the emerging Afroeurasian system?This problem we shall label "Regional Importance." And,
2. are there statistically significant amounts of synchronicity in urban growth and decline across distant regions that are similar (or different from) the synchronicities that we have found in the growth and decline of the territorial sizes of empires? This we shall call "City Synchronicity."

Regional Importance

Andre Gunder Frank's (1998) provocative study of the global economy from 1400 to 1800 CE[2] contends that China had long been the center of the global system. Franks also argues that the rise of European hegemony was a sudden and conjunctural development caused by the late emergence in China of a "high level equilibrium trap" and the success of Europeans in using bullion extracted from the Americas to buy their way into Chinese technological, financial and productive success. Frank contends that European hegemony was fragile from the start and will be short-lived with a predicted new rise of Chinese predominance in the near future. He also argues that the scholarly ignorance of the importance of China invalidates all the social science theories that have

mistakenly understood the rise of the West and the differences between the East and the West. In Frank's view there never was a transition from feudalism to capitalism that distinguished Europe from other regions of the world. He argues that the basic dynamics of development have been similar in the global system for 5000 years (Frank and Gills 1994).

Frank's model of development is basically a combination of state expansion and financial accumulation, although in *Reorient* he focuses almost exclusively on financial centrality as the major important element.His study of global flows of specie, especially silver, is an important contribution to our understanding of what happened between 1400 and 1800 CE.Frank also uses demographic weight, and especially population growth and growth of the size of cities, as an indicator of relative importance and developmental success.

It is our intention to systematically examine the growth of cities in order to shed more light on Frank's claims about the relative development of East and West. Our study will begin in 2000 BCE when we first have data on the population sizes of cities in different regions.Though we understand the spatial nature of world-systems in terms of the sizes of different kinds of interaction networks (Chase-Dunn and Hall 1997: Chapter 3), in this study we will compare the same regions over time despite the fact that interaction nets grow from being rather small to being global over the period we are studying. Thus the unit of analysis in this study is the region, and regions are held constant over the whole period.The regions we will study are:

1. Europe, including the Mediterranean and Aegean islands, that part of the Eurasian continent to the west of the Caucasus Mountains, but not Asia Minor (now Turkey).
2. West Asia- North Africa, including Asia Minor, Egypt, Mesopotamia, Syria, Persia, the Levant, and Bactria.
3. The South Asian subcontinent, including the Indus river valley.
4. East Asia, including China, Korea and Japan and Southeast Asia, but not Indonesia.

These regions are defined for purposes of examining the claims made by Frank and others about relative development and possible synchronicity.

Measures of importance based on city data

Wilkinson (1992,1993) compared East Asia with West Asia using data from Chandler (1987) on the number of large cities in each region. Wilkinson (1992, 1993) used political-military interaction

networks (which he calls "civilizations") as his unit of analysis. Political-military interaction networks (PMNs) are a good unit of analysis because the alliances and enmities of polities are an important systemic feature of all world-systems. But PMNs change in size and location over time. [3] For purposes of our present study we will use constant regions (described above) as the unit of analysis.

We have improved upon Wilkinson's study by weighting the cities by their population sizes. Using only the number of cities ignores differences in the sizes of cities. Figure 1 shows the population-weighted percentage that our four regions held of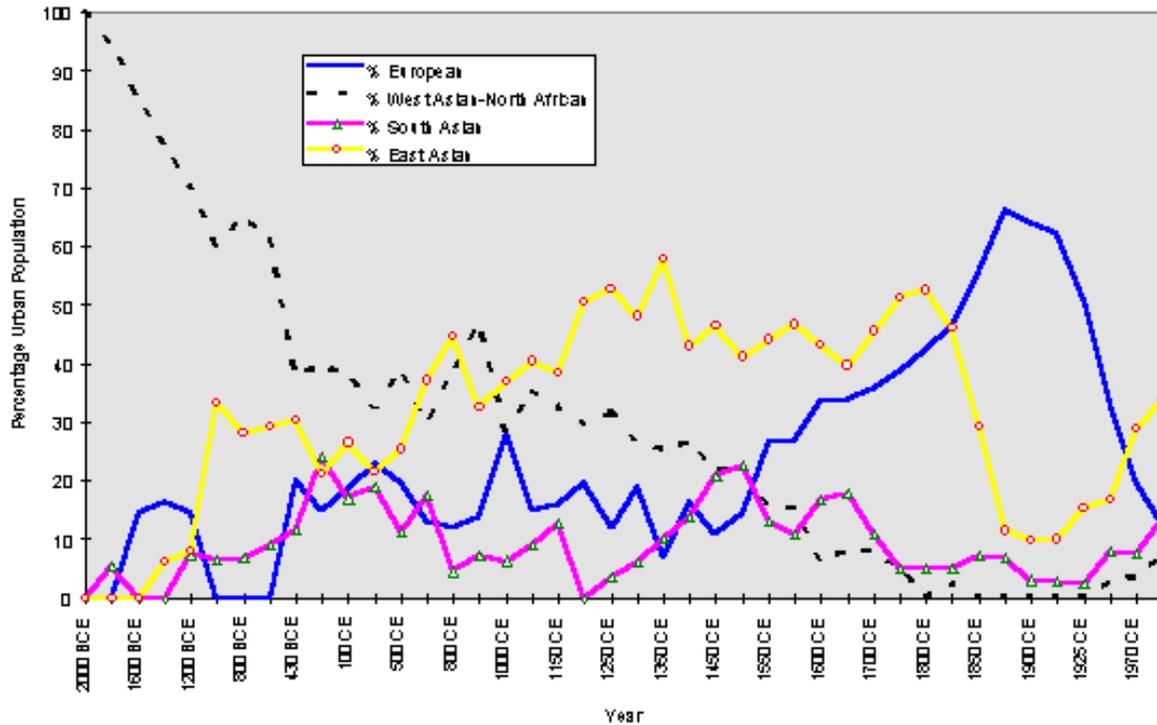 the twenty largest cities [4] on Earth from 2000 BCE to 1988 CE. [5] We also used the Chandler data, but we interpolated city sizes from Chandler's tables in order to estimate the populations of cities. [6] This provides only a rough guess, but is still an improvement over Wilkinson's simple count of the number of cities in each region.

Estimation of the population sizes of ancient cities is fraught with difficulties. In this paper we rely entirely on Chandler's estimates, though these are well known to contain errors, especially for ancient Mesopotamia and Egypt. [7] For our purposes in this paper these errors are unlikely to greatly distort the answers to the broad questions we are asking. We have begun a project that will upgrade Chandler's data using improved methods of estimation based on the work of anthropologists (Brown 1987, Ember 1973, Hassan 1981) and the late historical demography Paul Bairoch (1988). Our method of estimation uses the areal size of cities and estimates of areal population density and the size of typical households (Pasciuti and Chase-Dunn 2002). Despite the deficiencies of the Chandler dataset we contend that the gross comparisons between regions made in this paper will hold up well after the new upgraded city size dataset has been constructed.

Figure 1: Regional Urban Population as a % of the World's Largest Cities

In Figure 1 we see the emergence of the world's first cities in Mesopotamia and Egypt represented here by the designation West Asia/North Africa. In the upper left hand corner of the graph the dashed line shows that this region had 100% of the largest cities on Earth in 2000 BCE.As other regions developed large cities this monopoly necessarily diminished, and 4000 years later only a very small percentage of the world's largest citieswere in this region. This is strong evidence of the notion of uneven development and the geographical movement of the cutting edge of societal complexity.

The relative size-importance of European cities (indicated by the solid line) shows a long oscillation around a low level, indicating Europe's peripheral and semiperipheral location in the larger Afro-eurasian world-system. The long history of the incorporation of the very small systems of Europe into the expanding Central

System of West Asia/North Africa is portrayed in Figure 2 (see also Chase-Dunn and Hall, Chapter 9). Europe had been firmly incorporated into the trade networks of the Central System during the bronze and iron ages. Figure 1 indicates that by around 1450 CE Europe began a long rise. It passed East Asia in 1825 CE and peaked in 1850, and then underwent a rapid decline in importance as indicated by the relative size of largest cities.

Recall that all the largest cities on Earth, including those in the Americas and Oceania, are in the denominator of our measure of importance. So in the decades of the 20th century the percentages shown in Figure 1 do not add up to 100% because some of the largest cities are in none of the regions tracked (e.g. New York,Mexico City, etc.).When we use changing interaction network boundaries, as we have done in earlier research, these new large cities are included within the Central System, but the contribution of this study is to see what happens when we hold regions constant. Thus Figure 1 indicates that the relatively smaller and older European cities (e.g. London and Paris), were surpassed by the much larger American and Japanese cities in the 20th century.

The trajectory of Europe displayed in Figure 1 supports part of Gunder Frank's (1998) analysis, but contradicts another part. The small cities of Europe in the early period indicate its peripheral status *vis a vis* the core regions of West Asia/North Africa, South Asia and East Asia. As Frank argues, Europe did not best East Asia (as indicated by city sizes) until the eighteenth century.But the long European rise, beginning in the fifteenth century, contradicts Frank's depiction of a sudden and conjunctural emergence of European hegemony.Based on relative city sizes it appears that the rise of Europe occurred over a period of 500 years.

For East Asia we see in Figure 1 a rapid rise that began in 1200 BCE with the emergence of the first states in the Yellow River valley.This was followed by a small decline and then another burst

of relative urban growth that began in 361 CE and that rose to a peak in 800 CE, another decline, and then a further rise to the highest peak of all in 1350 CE.Then there was a small decline and another peak in 1800. Not until 1825 was East Asia bested by the European cities after a decline that started in 1800 and continued until 1914, when a recovery began. The European cities were bested again by the East Asian citiesbetween 1950 and 1970 during the rapid decline of the European cities in terms of their size-importance among the world's largest cities. This most recent rise of the East Asian cities isa consequence of the upward mobility of Japan and the East Asian NICs in the global political economy.Smith and Timberlake (2001) have demonstrated the contemporary rising importance of East Asian cities in the global airline transportation network. Frank's depiction of a sudden and radical decline of China that began in 1800 CE is supported in Figure 1.His analysis, which focuses on the period from 1400 to 1800 CE, does not examine the relative decline of East Asian predominance that began in 1350 and the rise to a new peak that began in 1650 as indicated in Figure 1.

The South Asian cities indicate how this region has fared during the long integration of the Afro-eurasian system.In Figure 1 the South Asian cities are indicated by the line with triangles.The early emergence of cities in the Indus river valley can be seen, as well as their demise, and then the rise of the Gangetic states that peaked, in terms of city size importance, in 200 BCE.The Indic cities disappeared completely from the world's twenty largest cities in 1200 CE, but then rose to another peak in 1500 corresponding with the Mughal empire.In 1988 the South Asian cities had risen once again to a level as high as they had had between 1650 and 1700 CE.

The Rise of Europe

Figure 2 shows the largest cities in each region from 1400 to 1988 CE. This, and the following figures, differ from Figure 1 in that they are not percentages of the world's largest cities, but are just graphs of the city sizes for each region. The most striking feature is the geometric growth rate of city sizes that began in Europe in the 19th centuryand spread to East Asia, South Asia and West Asia/North Africa.[8]
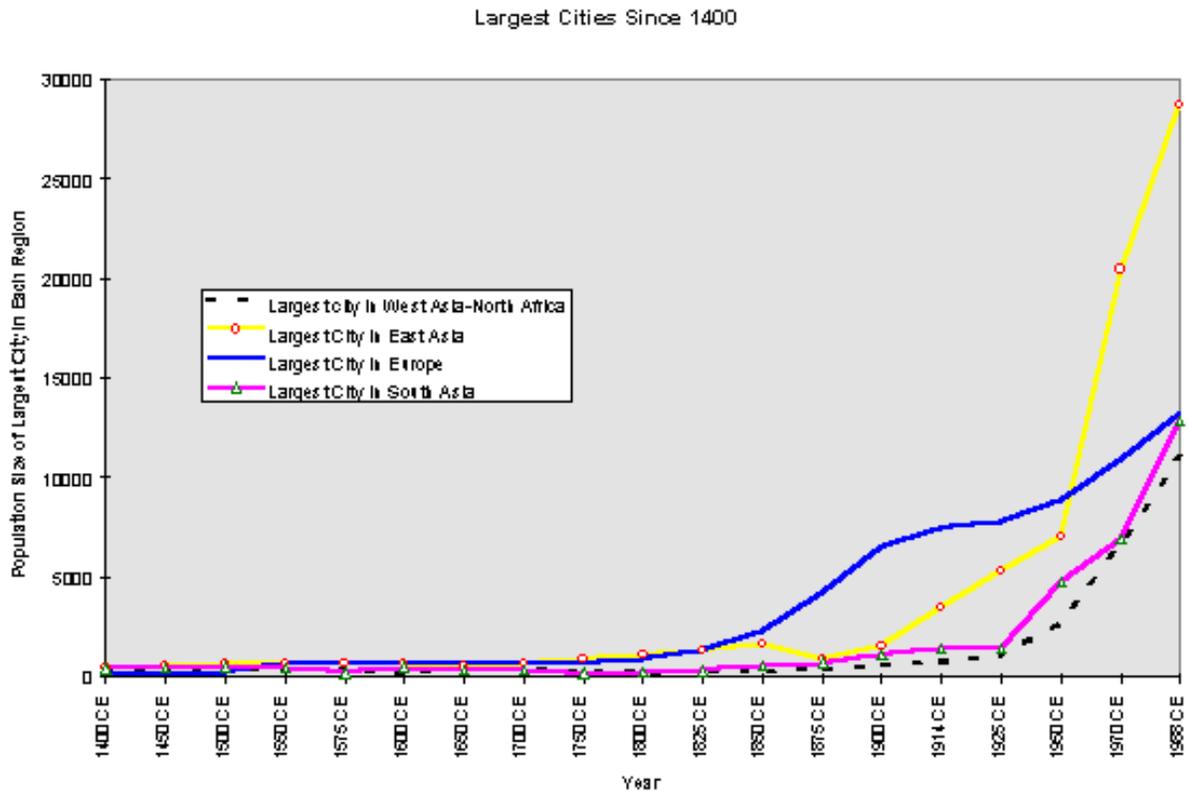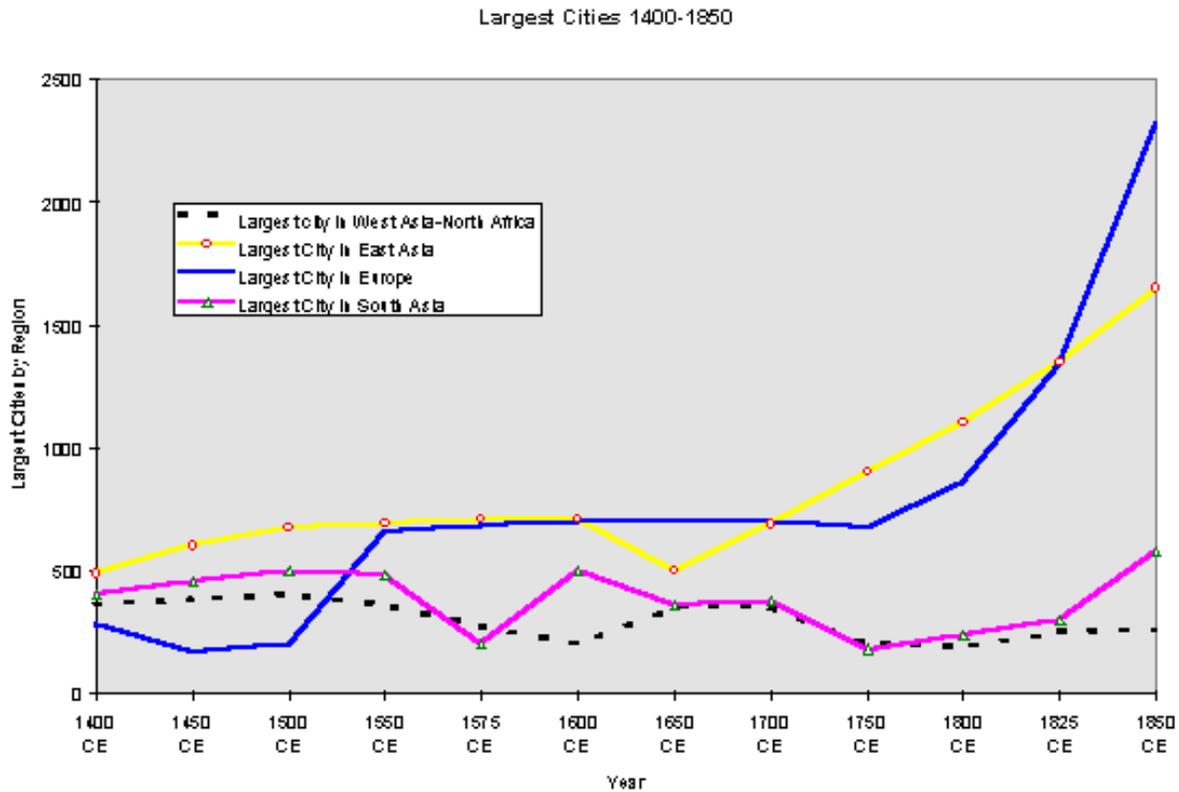
Figure 2: Largest Cities in each Region Since 1400 CE

New York, which became the largest city in the world by 1925, beating out London, is thus not included because we are studying constant regions. Tokyo, the third largest city in 1925, had become the largest city on Earth by 1970, and Osaka held third place in that year. By 1980 Tokyo was still first, but Mexico City held second place, and Sao Paolo was in fourth place. The geometric growth rate in the last two centuries obscures, in Figure 2, important fluctuations in the period from 1400 to 1850. These are germane to Frank's argument about the relative centrality of China and Europe.Figure 3 excludes the period after 1850 in order to show these

fluctuations.

Largest Cities 1400-1850

Figure 3: Largest Cities in each Region, 1400-1850 CE

During the period between 1400 and 1850 the largest cities in South Asia and in West Asia/North Africa did not increase in size. Rather they fluctuated around a level that was smaller than the largest East Asian cities at the beginning of the period, but larger than the largest cities in medieval Europe. Beginning in 1500 the largest European city, Constantinople, began a rapid period of

growth that achieved the size of the largest city in East Asia (Beijing) by 1550.European and Chinese cities were similarly large until 1700, when Beijing began another period of rapid growth. European growth experienced another upsurge after 1750 with the mushrooming of London, but the size of London did not equal that of Beijing until 1825. Within East Asia, Tokyo did not become larger than Beijing until 1900.

The patterns shown in Figure 3 are quite similar to those to be found in Figure 4, a graph of the sum of the three largest city populations in each region, except that the most recent European rise is shown to have begun earlier, in 1600.

Three Largest Cities, 1400-1850
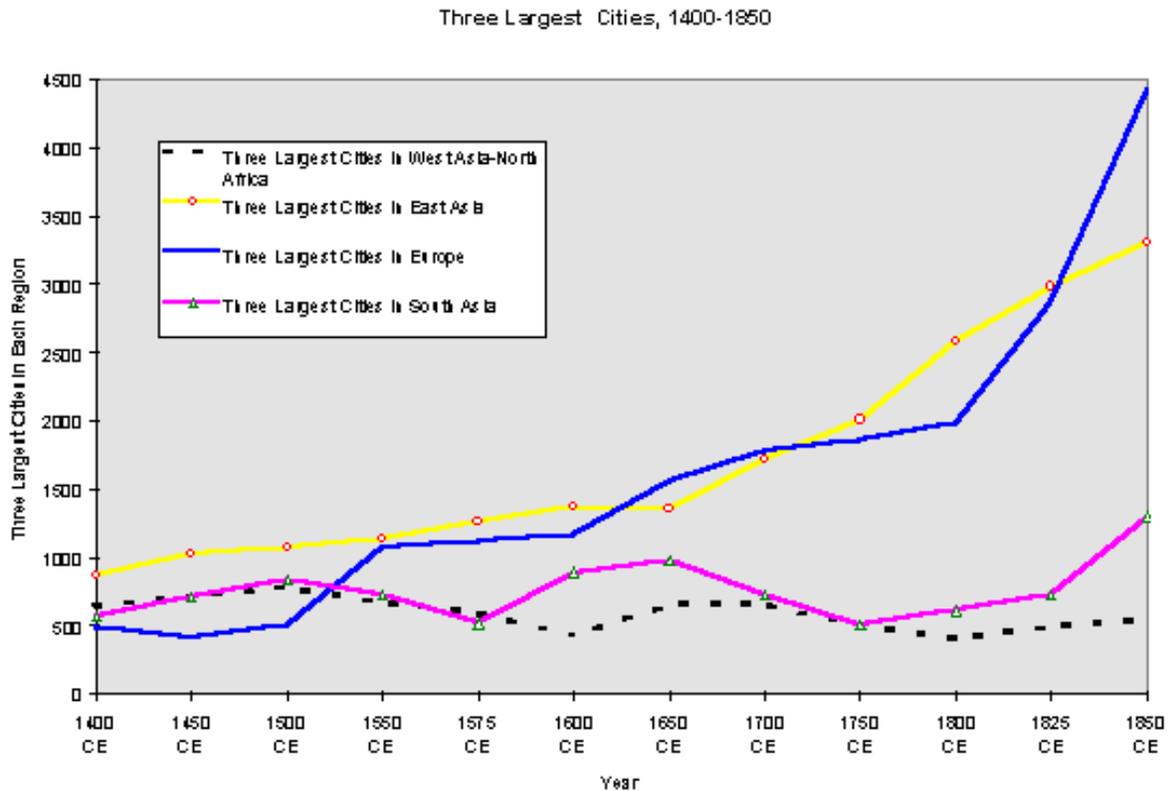
Figure 4: Three Largest Cities in each Region, 1400-1850 CE

Our examination of the largest cities in Europe and East Asia further reflects upon Frank's (1998) characterization of the centrality of China and the rise of European hegemony. While we have contended above that the "European" rise began much earlier than Frank describes (shown in Figures 1-4 above), this early rise appears to have been mainly due to the growth of Ottoman Constantinople.Though Constantinople was within the continent of Europe as we have defined it, Frank might contend that crediting the Christian Europeans of later fame with the success of the Ottoman Turks is unfair, and that this does not challenge his hypothesis of the conjunctural nature of European hegemony.

But there are some other facts that need to be taken into account here. The second and third largest cities in Europe in 1500 were Paris and Venice, followed by Naples and Milan.From 1500 to 1600 Paris grew from 185,000 to 245,000 and the other large cities of Christian Europe grew at a similar pace.So the early upsurge was not due only to the growth of Constantinople.Christian Europe was also experiencing a sixteenth century boom period. This does not dispute the relatively greater centrality of China in this period, but it does suggest that Christian Europe did not remain a peripheral backwater until it finally sprang to hegemony at the last minute in the 18th century.

Constantinople's size leveled off at 700,000 in 1600 and it stayed at that size until 1700, after which it began to decline. In this same period the largest cities of Christian Europe were growing rapidly. London grew larger than Constantinople by 1750.

City Synchronicity

This section replicates our study of synchronous changes in West and East Asian city systems. We have excluded the South Asian and European regions from this analysis because they do not reveal synchronicity with the other regions or with each other. There are two main differences between what we have done in this study and what we did in earlier work. The first is that we have grouped the cities according to constant regions rather than spatially changing political/military

interaction networks (PMNs), as described above. So the West Asia/North Africa region contains cities in this region over the whole time period rather than the expanding Central PMN studied by Chase-Dunn and Willard (1993) and Chase-Dunn and Hall (1997). The main difference due to this change is that emerging cities in the Aegean and points west are not included in the West Asian/ North African region, whereas they were included in the Central PMN. This might reduce the degree of synchronicity found because most of the Greek and Roman cities are in the European region, and an important component of the synchronicity found in earlier work was that between the rise and fall of the Roman and Han empires.

The other difference from earlier research is the use of a five-city SPI rather than a three-city SPI. This uses more of the cities in each region in the calculation of the SPI, and so should be a superior indicator of the city-size aspect of regional city systems. In practice the values are probably not greatly different from those obtained using only the three largest cities. The Standardized Primacy Index (SPI) is a statistic that was invented for comparing city size distributions (Walters 1985). It calculates a single number from the population sizes of the largest cities in a region based on deviations from the rank-size rule.

The rank-size rule hypothesizes that the largest city will be twice as large as the second largest city, three times as large as the third largest, and etc. The SPI calculates the average deviation from this standard in a manner similar to the Chi squared statistic, and the resulting value is "standardized" by dividing by the number of cities used to calculate the SPI. This makes it possible to compare city size distributions with data on different numbers of cities. The SPI takes a value of zero when a city size distribution meets the rank-size rule. Negative values indicate a flatter distribution and positive values indicate a steeper one.

In addition to the SPI, we used two other indicators of changes in regional city systems. These are:
- the population size of the largest city, and
- the sum of the populations of the three largest cities.

Figure 5 shows our replication of the Eastern-Western comparison based on the five-city SPI and using spatially constant regions. Visual inspection of Figure 5 suggests a definite correlation

between the rise and fall of steep and flat city size distributions in these distant regions from 800 BCE to 1600 CE. Before and after this period there is no correspondence between East and West Asian city size distributions.The synchronous Pearson's r correlation coefficient produced by the values in Figure 5 is .32, and this approaches, but does not reach, statistical significance.
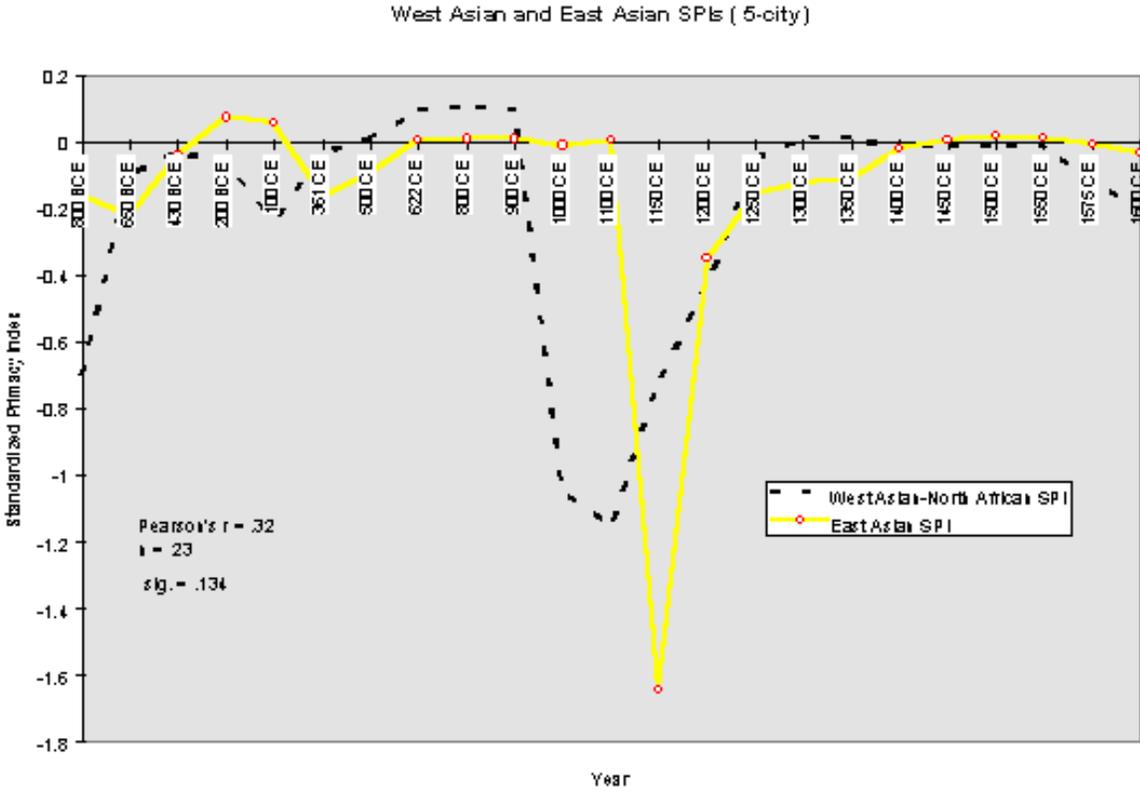

Figure 5: West Asian and East Asian 5-city Standardized Primacy Indices

Figure 10.7 in Chase-Dunn and Hall (1997:217), based on a three-city SPI and comparing the Central and East Asian PMNs, finds a synchronous correlation of .44 and this is statistically significant at the .03 level.We suspect that the somewhat weaker correlation produced in this study

is due to the fact that Rome is not included in the West Asian/North African region, whereas it was included in the Central PMN.The correlation between Roman and Han events and development, studied closely by Teggart (1939), was an important piece of the synchronicity of the Afro-eurasian system.That we find a substantial degree of synchronicity even when Rome is excluded is additional support for the hypothesis that East and West Asian growth/decline processes were linked in some way.

Visual inspection of Figure 5 also suggests a lead-lag relationship between East and West Asian city size changes. The West Asian/North African city size distribution seems to be leading the ups and downs by a lag of one or two hundred years.This may be an important clue to the nature of the causal relations that link the two regions, but this suggested lag needs to be investigated using more temporally fine data. The long periods between measured city sizes in the Chandler data, especially before 1000 CE, make any statements about synchronicity or lagged relationships open to a good degree of doubt.On the other hand, our replication of the synchronicity found in empire size data using temporally finer time points increased the correlation found between the East Asian and Central PMNs (Chase-Dunn, Manning and Hall 1999).City population data for more time points and shorter intervals needs to be assembled to see how city synchronicity fairs with temporally finer data.

Figure 6 shows the trajectories of changes in the population sizes of the largest cities in East and West Asia over the same period as examined in Figure 5. The Pearson's r synchronous correlation coefficient of .55, significant at the .003 level, further supports the hypothesis of East-West Asian city synchronicity.
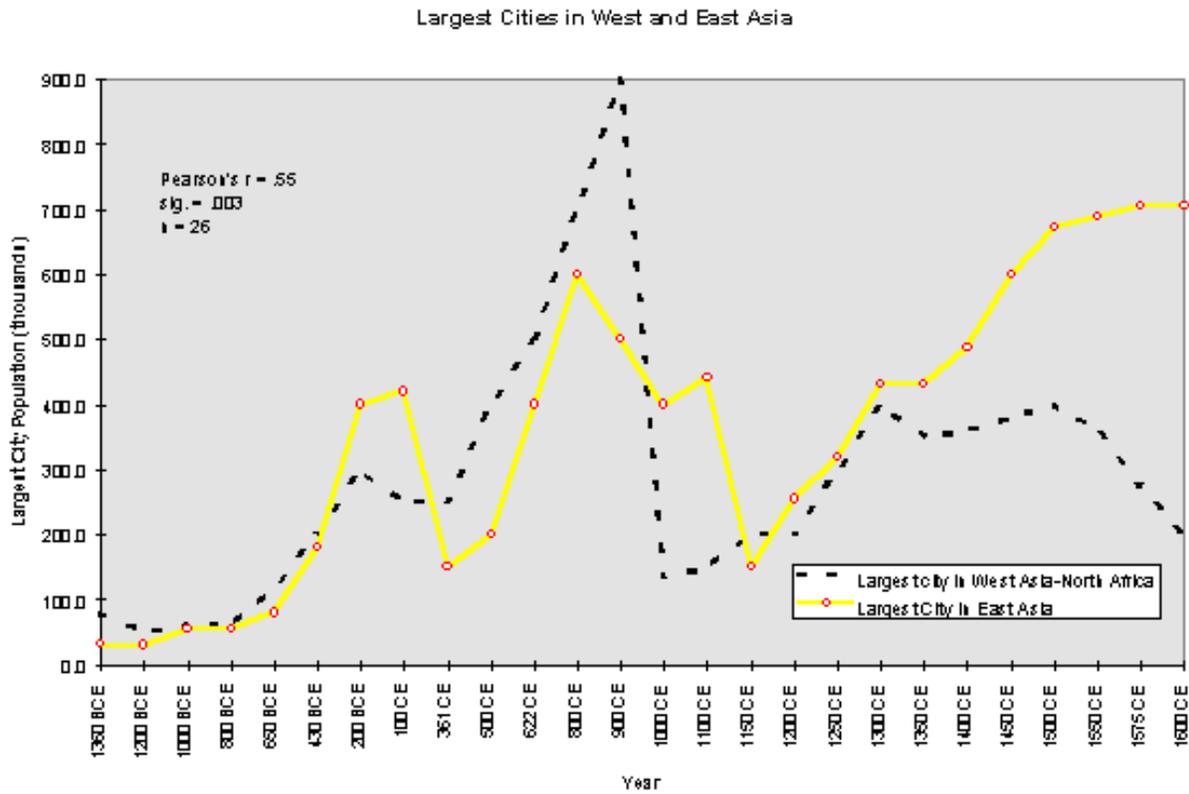
Figure 6: Largest Cities in West Asia/North Africa and in East Asia

Visual inspection of Figure 6 also suggests a lead-lag relationship, but it is more complicated than what is indicated in Figure 5. The temporal lead of changes in direction (growth and decline) seems to shift back and forth between West Asia/North Africa and East Asia. For example, the decline in the size of the largest city that began in East Asia in 800 CE did not start in West Asia until 900 CE, and the rise that began in East Asia in 1000 CE did not start in West Asia until 1150

CE. On the other hand the earlier rise and decline seems to have been led by West Asia. Again, these lag structures require further investigation that uses more temporally fine data with measurement points that are closer together.

Figure 7 includes data on the three largest cities in each region. The correlation coefficient further supports the hypothesis of city synchronicity. Visual inspection suggests another complicated lead-lag relationship with both regions leading during different periods.
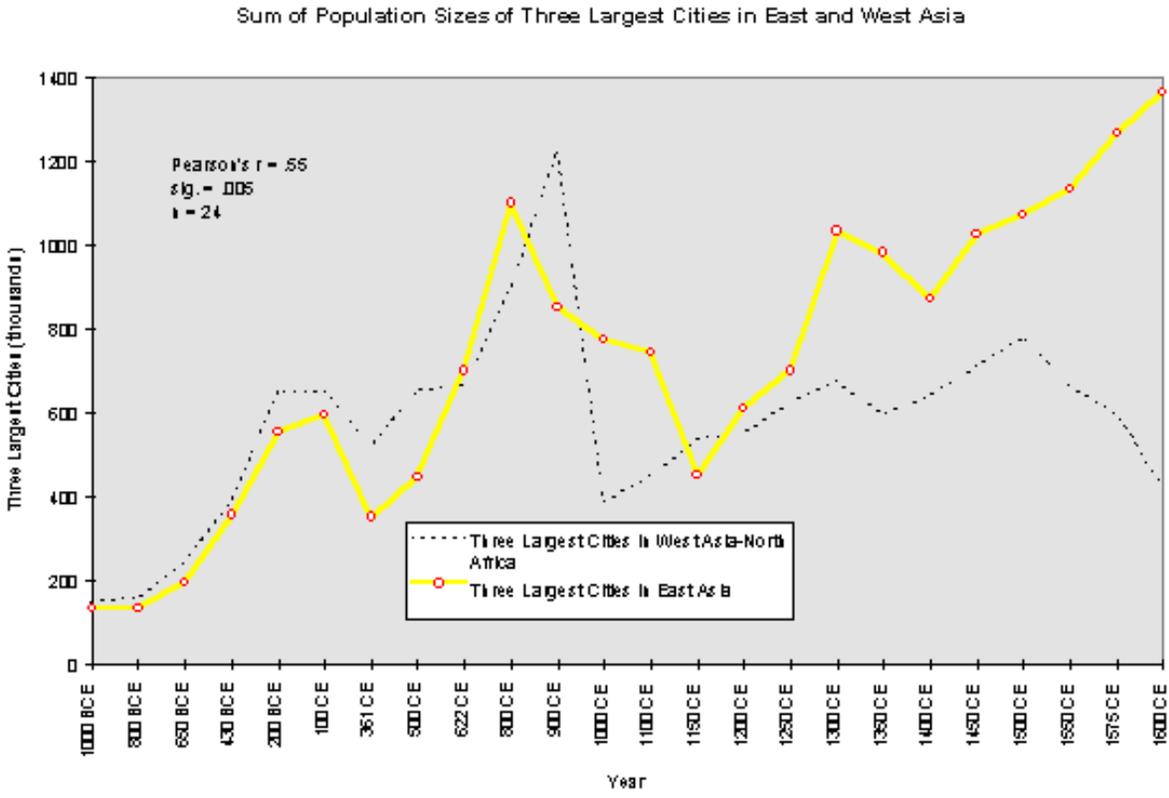

Figure 7: Three Largest Cities in East Asia and West Asia/North Africa

The question of causal explanations of the East/West synchronicity of city and empire growth-

decline sequences in this period has been discussed in earlier studies (Chase-Dunn and Willard 1993; Chase-Dunn and Hall 1997; Chase-Dunn, Manning and Hall 1999). Basically these boil down to the following possibilities:

1. Long-distance trade between these distant regions transmitted economic forces great enough to bring them into a synchronous pattern of growth and decline.
2. The cycle of the rise and fall of semiperipheral (or peripheral) states in Central Asia – the steppe nomad confederations that periodically attacked the agrarian empires of the East and the West – brought the East and West Asian systems into synchronicity.
3. It is possible that epidemic diseases periodically swept across Afroeurasia causing synchronous waves of urban depopulation and disrupting large empires.
4. Some force exogenous to both regions created a synchronous pattern of expansion and contraction. The only candidate is climate change.

Of probable relevance is the fact that the South Asian region, spatially in between the Eastern and Western Asian regions, was not brought into either city or empire synchronicity with the others (Chase-Dunn and Hall 1997, Chase-Dunn Manning and Hall 2000). And the apparent lack of any synchronicity before 800 BCE or after 1600 CE is also an important clue. The possibility of a Western temporal priority suggested by visual inspection of Figure 5 above, would also be important because causality is assumed to go forward, but not backward, in time.

Conclusions

We can report additional support for the hypothesis of city synchronization between 800 BCE and 1600 CE for the distant regions of East Asia and West Asia/North Africa. The causality that resulted in this phenomenon is still unknown. What is needed is the operationalization for the relevant regions and time period of measures of the main hypothesized causal variables: climate change, warfare, and long-distance trade (e.g. Chase-Dunn 1995). Further research will also improve upon the city and empire size data, and should investigate the relationship between these within and across regions (e.g. Chase-Dunn, Alvarez and Pasciuti 2002).

Our examination of the problem of the relative importance of regions relies exclusively on the population sizes of cities, a less than ideal indicator of power and relative centrality as discussed in the introductory section of this paper. Nevertheless, our results suggest some possible problems with Andre Gunder Frank's (1998) characterization of the relationship between Europe and China

before and during the rise of European hegemony. Frank's contention that Europe was primarily a peripheral region relative to the core regions of the Afro-eurasian world-system is supported by the city data, with some qualifications.Europe was for millennia a periphery of the large cities and powerful empires of ancient West Asian and North Africa. The Greek and Roman cores were instances of semiperipheral marcher states that conquered important parts of the older West Asian/North African core. After the decline of the Western Roman Empire, the core shifted back toward the East and Europe was once again importantly peripheral.

The synchronicity findings support the idea proposed in Frank and Gills (1994) that there was an integrated Afro-eurasian world-system much earlier than most historians and civilizationists suppose. But we cannot yet be certain that interaction networks were important causes of the synchronicity, and if they were, we do not know which kind of interaction was most important. Counter to Frank's contention, however, the rise of European hegemony was not a sudden conjunctural event that was due solely to a developmental crisis in China. The city population data indicate that an important renewed core formation process had been emerging within Europe since at least the 14th century.This was partly a consequence of European extraction of resources from its own expanded periphery. But it was also likely due to the unusually virulent form of capitalist accumulation within Europe, and the effects of this on the nature and actions of states. The development of European capitalism began among the city-states of Italy. It spread to the European interstate system, eventually resulting in the first capitalist nation-state – the Dutch Republic of the seventeenth century as well as the later rise of the hegemony of the United Kingdom of Great Britain in the nineteenth century. This process of regional core formation and its associated emphasis on capitalist commodity production further spread and institutionalized the logic of capitalist accumulation by defeating the efforts of territorial empires (Hapsburgs, Napoleonic France) to return the expanding European core to a more tributary mode of accumulation.

Acknowledging some of the uniquenesses of the emerging European hegemony does not require

us to ignore the important continuities that also existed as well as the consequential ways in which European developments were linked with processes going on in the rest of the Afroeurasian world-system.

The more recent emergence of East Asian cities as again the very largest cities on Earth occurred in a context that was structurally and developmentally distinct from the multi-core system that still existed in 1800 CE. Now there is only one core because all core states are directly interacting with one another. While the multi-core system prior to the eighteenth century was undoubtedly systemically integrated to an important extent, it was not as interdependent as the global world-system has now become.

A new East Asian hegemony is by no means a certainty, as both the United States and German-led Europe will be strong contenders in the coming period ofhegemonic rivalry (Bornschier and Chase-Dunn 1999). In this competition megacities may be more a liability than an advantage because the costs of these huge human agglomerations have continued to increase, while the benefits have been somewhat diminished by the falling costs of transportation and communication.Nevertheless megacities will continue to be an indicator of predominance because societies that can afford them will have demonstrated the ability to mobilize huge resources.

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NOTE

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[1] A study of the relationship between city systems and power over the long run is examining the relationship between urban growth, city size distributions and changes in the territorial sizes of empires (Chase-Dunn, Alvarez and Pasciuti 2002).

[2] We use the designations now employed by most world historians. BCE means "before common era," and CE means "common era."

[3] Wilkinson has chronographed the expansion of both political/military networks and trade networks. He uses the term "Central Civilization" for the PMN that was formed by the merger of the Mesopotamian and Eqyptian PMNs in about 1500 BCE. We call this entity the Central PMN.

[4] Before 650 BCE the number of largest cities reported in Chandler is fewer than twenty, as follows:

Year	Number of largest cities
2000 BCE	7
1800 BCE	10
1600 BCE	13
1360 BCE	16
1200 BCE	11
1000 BCE	13
800 BCE	17
600 BCE	20

[5] Note that these regions do not include the Americas or Oceania. Europe means cities on the continent of Europe, not cities populated by people who migrated from Europe.

[6] Only 11 % of the city populations we studied were interpolated, and all of these were before 1300 CE.

[7] The city size data by region that we used in this paper are contained in an excel file at http://irows.ucr.edu/research/citemp/ccr02/citypop5.xls

[8] Again, because we are studying constant regions, the big cities of the Americas are not included in Figure 2.