
War Cycles

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ABSTRACT

By re-analyzing latest conflict data (great power battle fatalities from all wars, Goldstein 1988 and COW/PRIO 2005) from 1495 to 2002 and as yet unpublished UNIDO data about the growth of world industrial production 1740–2004 it is shown that the long Kuznets and Kondratiev swings and cycles of capitalist world development that play such an important role in the analysis of global war since 1495 have indeed not ended after the end of Communism, and that instability, and not stability, characterizes the world economy, and that there is an indented 'W' shaped pattern of global conflict since 1495 that did not end with the end of the Cold War. To this effect, we present in this work new conflict data for the involvement of the Great Powers (from 1945 onwards UN Permanent Security Council members + Germany, before 1945 definition Goldstein 1988, based on the works of Levy, see page 235 in Goldstein 1988) in wars (annual battle fatalities) for the entire period 1945–2002, based on standard peace research data (PRIO Oslo, Correlates of War data).

World hegemonies that characterize the workings of world capitalism arise and they also end. Work by Attinà and Modelski suggests that we most probably will not escape the fatal cycle of global leaderships and global contenders. Since the mid 1960s, the defense pact aggregation index that measures the percentage share of defense pact members in the total number of states in the international system i.e. the control that existing, established mechanisms of world political leadership exercise over global politics, has declined, suggesting that the era of global power by the United States, which was established in 1945, definitely comes to an end and that our era is pretty similar to the era 1850–1878, which was characterized by the de-legitimation of the then British leadership, followed by the de-concentration of the international system and

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the era of coalition-building between 1878–1914, which ended, as we all too well know, in the catastrophe of 1914.

Our hypothesis is – also in view of developments beyond the 1990s – that the belle époque of globalization from 1960–1990 did not bring about a more stable, egalitarian and peaceful world.

JEL classification: F5 – International Relations and International Political Economy; F52 – National Security; Economic Nationalism; F59 – International Relations and International Political Economy: Other.

INTRODUCTION

One of the most intriguing features of world systems theory is its prediction of the recurrence of global wars in the world capitalist system. By re-analyzing latest conflict data (great power battle fatalities from all wars, Goldstein 1988 and COW/PRIO 2005) from 1595 to 2002 and as yet unpublished UNIDO data about the growth of world industrial production 1740–2004 it is shown that the long Kuznets and Kondratieff swings and cycles of capitalist world development that play such an important role in the analysis of global war since 1495 have indeed not ended after the end of Communism, and that instability, and not stability, characterizes the world economy, and that there is an indented ‘W’ shaped pattern of global conflict since 1495 that did not end with the end of the Cold War.

To this effect, we present new conflict data for the involvement of the Great Powers (UN Permanent Security Council members + Germany) in wars (annual battle fatalities) for the entire period 1945–2002 based on standard peace research data (PRIO Oslo, Correlates of War data). Data before 1945 are from the well-known data series, presented by Joshua Goldstein.

CYCLE OF WORLD WARS DEPRESSIONS

There were voices that predicted the ‘end of history’ in the 1990s. The world systems approach takes a more cautious line and would not preclude – at least in principle – a repetition of the insane economic cycles and major power rivalries that characterized the course of history since 1450 and which produced three devastating global wars, 1618–1648; 1793–1815; and 1914–1945 (see the by now classic contribution by Goldstein 1988). We would like to test here these world system theory propositions with new data of world industrial production growth from 1740 through to 2004

(based up to 1975 on Goldstein, and from 1975 onwards on as yet unpublished data and estimates by the United Nations Industrial Development Organization in Vienna, kindly put to our disposal by its Statistical Director Dr. Tetsuo Yamada) and new data about great power battle fatalities from all wars, 1945–2002 (based on PRIO/Correlates of War data). In view of the methodological critique by several authors, including Beck (1991) and Silverberg (2005), against the ‘long wave school’ it would seem appropriate rather to talk about ‘tendencies’ or ‘waves’ and not about ‘cycles’. Silverberg's recent research paper applies spectral density analysis to two famous world system time series, Modelski's and Thompson's seapower index and the Levy-Goldstein great power fatalities data series, see below. However, we try to show by using Kondratieff's classic techniques of polynomial regressions that there are several cycles, and not one cycle, of global economics and politics.

The recurrence of major power wars in the capitalist world economy from 1495 to the present is one of the most intriguing features of the existing international system. The x -axis in Graph 1 presents the number of years after the end of the major power wars, *i.e.* 1648, 1816, and 1945. Each world political cycle up to now corresponded to a ‘ W ’-pattern of untransformed annual battle fatalities from major power wars in thousands.

The untransformed data for the war cycle 1495–1648 are statistically well explained by a polynomial expression of the 6th order over time; R^2 is 91.7 %; 1649–1816 yields an R^2 of 33.6 %; while a polynomial expression of the 6th order over time explains 50.1 % of war intensity 1817–1945. The international system is indeed characterized according to Goldstein by the following sequence of cycles:

**global war → world hegemony of the dominant power
→ de-legitimization of the international order →
de-concentration of the global system → global war,
*et cetera***

The duration of these sub-phases of the international order is approximately one Kondratieff cycle each (an economic cycle of 50 to 60 years duration, see below), so the unit of time of the international system can be symbolized by the expression – one Kondratieff – 1_K . An entire hegemonic cycle lasts 3 Kondratieff cycles.

Different sub-schools, like Goldstein, Russett, Weede or the present author (Tausch 1997–2000) thought it unlikely that a major confrontation between the centers of ‘world capitalism’ might characterize the 21st Century, and that there are other, more likely candidates for such a terrible scenario. It is important to remember that there are pre-conditions for such a ‘democratic peace’ between the major centers of global power, mainly the maintenance of democracy in the countries concerned. Christopher K. Chase-Dunn and Bruce Podobnik wrote the most consistent, provocative scenario about global conflict involving the European Union. They think in earnest that – what they term – a European Union under the leadership of Germany – will be involved – with a chance of 50/50 – in a major global military confrontation with the United States by 2020! Immanuel Maurice Wallerstein, on the other hand, thinks it entirely likely that in the end we will be confronted with a major warfare between Europe and Asia in the 21st Century (Wallerstein 2000).

Although this might be termed an absolute exaggeration of projective social scientific writing, a more careful re-reading of the world systems approach – especially the writings of Giovanni Arrighi, George Modelski, Andre Gunder Frank and Immanuel Wallerstein – does suggest that the 21st Century will be characterized by a further shift of the world economic centers of gravity towards Asia, and that the maintenance of peace of such an enlarged Europe to the outside world will depend on European Union democracy, technical innovation, and the avoidance of what Arrighi has called – in allusion to the concept of power of historical Venice – a ‘*terra ferma*’ constellation, *i.e.* the territorial concept of power and the exploitation of the hinterland – *the terra ferma*. In the history of the world economy, such major geographical shifts of economic activities and of military power – like in 1340, 1560, 1750 and 1930 – were always associated with major wars and with a very deep economic depression.

We agree with Modelski (1999) that global challengers in the world system were always characterized by the interaction of (a) a large army, (b) a large economy, (c) a closed, controlled society, and (d) weak, ethnocentric media. Russett's hypothesis about the great probability of peace between democracies is an all-important, further element in this debate.

At any rate, the future of the open society in Europe, the exact fulfillment of the Copenhagen criteria of a functioning democracy and market economy in the EU enlargement process, and the future democratization of the Union – also in face of the darker sides of the European heritage and the very idea of an economically united Europe under authoritarian premises under Nazi rule before 1945 (Laughland 1998) – become decisive whether or not Europe will become a global challenger in Modelski's sense, and will determine whether Europe is a new challenger of the new evolving global leadership along the Pacific axis that could fit into the pattern, described by Modelski, as including (a) an oceanic navy, (b) lead industries and fiscal strength, (c) a democratic potential, party system, and (d) a strong active media.

A relatively closed society, combined with high customs, a reliance on military land power, exploitative relations with the internal and immediate external peripheries (the hinterland of Northern Italy before the great Italian wars of the 13th and 14th century, the Spanish colonies and internal peripheries in Hapsburg Europe before the global war 1618, the French internal peripheries and colonies before the Napoleonic Wars, and Germany's '*Drang nach Osten*' before 1914) and a relatively weak technological home-base characterized the attempts at world power, while the successful world hegemonies (the United Provinces of the Netherlands, the United Kingdom, and the United States) were each time the practical opposites on all or most of these dimensions: a naval, knowledge-driven and world-market concept of power, a society open to migration, low customs, a large sea power and a smaller, but mobile and disciplined and readily deployable land-army, and a strong technological home-base.

Significant for hegemonic success is also the strong social role of the urban merchant class that is in stark contrast to the ties between the land and capitalism, characteristic of the '*rentier*' political economy of Hapsburg Europe, France, and Germany, the historic challengers that lost the world leadership contest (see Graph 2 [a, b, c, d]).

World hegemonies that characterized the workings of world capitalism, arise and they also end. As it is well-known in world system research, especially from the works of Arrighi and Silver, there are signal crises of world capitalism (the usual Kondratieff depressions), and there are terminal crises of the world system,

when hegemonies end. Peaceful transitions from one hegemony to the other are among the most intricate questions of peace research and peace policy of our time.

These moments of world hegemony transformation, as Arrighi and Silver and as Boswell (1999) have shown, are especially dangerous culminations of world depressions and are characterized by a subsequent fight for world hegemony, like during the great crash of the early 1340s, which marked the beginning of the Genoese age (Arrighi) or Portuguese and Genoese age (Modelski), the crash of the 1560s, which marked the beginning of the Dutch era, the depression of the 1750s and 1760s, which marked the beginning of the British era, and the Great Depression in the 1930s, which was the terminal crisis of British world capitalist dominance (Arrighi 1995). Regulation can be successful, like after 1560, and 1930, and deregulation can be successful, like after 1340, 1760, and – most probably – the 1980s (compiled from Arrighi 1995).

A serious debate about the aspects of Genoa's hegemony is beyond the limits of this essay, and would presuppose an enormous amount of details about Italian Medieval and early modern history. It seems important to remind readers here – as the mathematician and anthropologist Douglas White from the University of California at Irvine has shown in an interesting reaction to Arrighi's theory (<http://eclectic.ss.uci.edu/~drwhite/Anthro179a/inflate1text.htm>) – that Genoa's ascent began in 1298, when Genoa's fleet defeats the Venetian fleet.

The following historical data are less contentious: 1648: Treaty of Westphalia, consolidation of Dutch hegemony; 1797: The British fleet defeats Dutch fleet at Battle of Camperdown. Britain establishes hegemony. 1919: The British 'century' came to an end only when the World War exhausted its energies and drained its reserves. 1945: the cycle of the US hegemony begins.

A world hegemony evolves and declines during at least two Kondratieff cycles. We think it fairly safe to assume that there is no such early forthcoming terminal crisis of the capitalist system, but that the risk for such a crisis rapidly increases after 2020 or 2030. Even at the risk of gross oversimplification, the following scheme could be drawn (see Graph 3: Terminal Crises of Capitalism).

There seems to be ample evidence, reproduced, among others, in Tausch (2003) that the terminal crises of capitalism, like Tsunami waves of world politics, have devastating consequences for

the well-being of the great majority of humanity. Evidence, based on the works of Andre Gunder Frank and Rudolph Rummel suggests that as a consequence of the terrible world depressions of the 1350s (coinciding with the Black Death) and 1750s, Europe lost significantly its share in total world population, while the earthquake of world politics 1900–1950 had an estimated 187.7 million victims in terms of political repression, genocide and democide, *i.e.* a good part of all the estimated total victims (482 million human beings) of democide, wars and repression in total human history. Among the major world systems researchers of our time, the late Andre Gunder Frank was most active in championing the idea that there are major economic cycles dating back 5000 years in human history. This idea was put forward by him for example in 1994, in an important paper which he presented to the New England Historical Association. A more final word by Frank on these large cycles is to be found, among others, in his ‘ReOrient’ 1998: 248ff.

For Modelski, the following larger cycles hold: see Table 1: K-waves: the sequence of global leading sectors according to Modelski and Table 2: The Co-evolution of Global Economics and Politics according to Modelski.

THE CONFLICT CLOCK

So, where are we now? 1870? 1913? 1938? World systems theory is full of speculation about the future, and much of world systems research writing projects a major global war by around 2020 or 2030. Just let us quote from famous world systems researchers:

a) Goldstein (2005) returned to his ‘conflict clock’ (Goldstein 1988: 259). Looking back on his predictions and his work, he now defines 2000 as the war trough year, to be followed by a 2005 price trough and real wage peak, 2010 an expansion phase, 2015 a production peak, 2020 an investment peak, 2025 an innovation trough and 2025 a war peak, and 2030 a price peak. Goldstein is clear about his prediction about the 2020s as the next real danger zone of world politics: *‘In my 1988 book I pointed to the period around the 2020s as a potential danger zone, and it still worries me’* (Goldstein 2005: 8).

b) Chase-Dunn and Podobnik (1999) see a 50/50 chance of global war by around 2020, with the most likely contenders of the

US being either a United Europe under German leadership or Japan.

c) Boswell (1999) presents a list of 10 system evolution steps, starting by the relative decline of the United States, followed by imperial rivalry and global war between 2010 and 2020, to be followed by another world system sequence, ending by 2080 or 2090 in yet another cycle of relative decline of the hegemon who won the last world war by 2010/2020...

d) Work by Attinà and Modelski also suggests that we most probably will not escape the fatal cycle of global leaderships and global contenders. Since the mid 1960s, the defense pact aggregation index that measures the percentage share of defense pact members in the total number of states in the international system *i.e.* the control that existing, established mechanisms of world political leadership exercise over global politics, has declined, suggesting that the era of global power by the United States which was established in 1945 definitely comes to an end and that our era is pretty similar to the era 1850–1878, which was characterized by the de-legitimation of the then British leadership, followed by the de-concentration of the international system and the era of coalition-building between 1878–1914, which ended, as we all too well know, in the catastrophe of 1914. Goldstein interprets the past global political cycles as:

**global war → world hegemony of the dominant power →
de-legitimization of the international order → de-
concentration of the global system → global war *et cetera***

Attinà interprets the global political cycles of the world system in accordance with Modelski as:

**global war macrodecision → global power execution →
de-legitimization and agenda setting → de-
concentration and coalition building → global war mac-
rodecision *et cetera***

The defense pact aggregation index neatly measures, Attinà argues, these cycles. In our Graph 4, we compare these cycles with the long swing of world economic development and come to the conclusion that these two cyclical movements are roughly in parallel. The tsunami crisis of world politics precedes the tsunami economic crisis? (See Graph 4a: Global political leadership and the

long cycles of world development: declining growth rates and world political de-concentration – the evidence for the period after the Congress of Vienna 1814–1815 and Graph 4b: Global political leadership and the long cycles of world development: world political de-concentration and economic stagnation (B-phases of 100 year logistic cycles in the tradition of Wallerstein) – the evidence for the period after the Congress of Vienna 1814–1815.)

At any rate, the contemporary geographic and systemic **selective retreat** of the respects for **‘civil rights’ (standard Western concept¹)** – an average positive trend development 1995–2003 notwithstanding – suggests that **‘freedom’ (standard Western concept) is on the retreat precisely in those regions, where there were gains in ‘freedom’ and ‘human rights’ owing to the transformations of 1989 and the second and third wave of democratization of the 1980s and 1990s**, thus partially contradicting the liberal globalist optimism inherent in the analysis by Soysa and Gleditsch (2002). The **retreat of ‘democracy and human rights’ will most probably go hand in hand with a more conflict-oriented foreign policy in years to come**. Under the weight of globalization and the openings of markets, the weak economies and societies of the former communist world and several democracies of the South witness a retreat of civil liberties, exacerbated by the recent wave of increasing human rights abuses in the context of the *‘global war on terror’* (see Graph 5: The Regions of the retreat of the respect for civil rights, 1995–2003: a) the evidence on a world level; b) the evidence for the ‘North Atlantic arena’).

Recently, researchers have dealt with the specific aspects of the long-term relative decline of the United States in global politics. But at this stage, it is important to look into the cycles of reform and regime tightening in Eastern Europe. Just as during the world depression of the 1930s democracy could not survive in the region (Polanyi 1944), today the danger arises that instability and not democratization will triumph in the end, especially in countries like those of the former USSR. The turning points in the long waves between the ascents and decline phases (B-phases) were always the beginnings of political decay in the region, while the ascent phases were associated with authoritarian modernization; time-lags between the Western cycle and the Eastern semi-periphery and periphery have to be taken into account. The decisive-*kairos*-years

are (dates before 1756 from Goldstein 1988): 1509, 1539, 1575, 1621, 1689, 1756, 1832, 1885, 1932, and 1975.

The former hegemonic contenders from earlier global wars slowly slide into an acceptance of their status in the international system. The real power struggle erupts already soon after the great hegemonic war, and through the ups and downs of the history of the system evolves slowly into the hegemonic challenge. Seen in such a way, not 1989, but Korea and Vietnam could become rather the benchmarks of the future W-structure of conflict in the international arena (see Table 3: Projected Logic of World Power Competition 1495–2002).

The triumphalism of America being the unrivalled military hegemonic power of our world notwithstanding, we believe that a serious strategic and political science analysis quickly reveals the direct manpower and other military constraints against continued U.S. military and political dominance in world affairs (Adams 2005). It is often said that like Old Rome, America is without parallels in terms of military strength.

But such claims are a simple myth, resting upon military spending figures that just demonstrate that the Pentagon spends a real lot of money converted into international exchange rates that are still favorable to the US Dollar but which are exchange rates untenable in the long run in view of the huge double deficits of the US economy. What is unparalleled in human history is not the 'bang' that the US Conventional Forces can deliver on the ground, especially in a guerrilla warfare situation, but the 'buck' that went to the Pentagon defense contractors, indeed an amount really unparalleled around the globe. The US budget deficit is now (2007) at 1.9 % of GDP, and the current account balance deficit per GDP is 5.4 %, and economic growth only 1.9 %, as stated by 'Economist' Country Briefings, September 2007. Compare this to the +2.44 % budget data when President George W. Bush took over in 2000, as well as the current account deficit that was still at 4.19 % of GDP the same year. What military manpower is concerned, even the 'smaller' wars in Iraq and in Afghanistan show the extreme limits of the current extremely capital intensive U.S. military doctrine, and for manpower reasons alone the US would be in no position to fight several conventional wars at the same time, let alone fighting another major confrontation at the same time as fighting the insurgencies in Iraq and Afghanistan.

Our final synopsis about world system tendencies towards peace or towards conflict do not support the generalized hypothesis that with global capitalism peace is ‘around the corner’. Apart from the well-known data on conflicts per decade in the world system over the last 500 years (Brecke 1999) that show no secular trend towards peace under globalization, we are especially preoccupied about the economic growth and war intensity connection that seems to have evolved in the world system, if not earlier, than at least since 1946. It is entirely possible that a military Keynesian consensus will emerge in the world system, but that will be a consensus towards warfare (see Graph 6: War intensity and world industrial production growth since 1946: a) the original data; b) three-year sliding averages; c) the stylized relationships over time).

Also, the relationship between declining world political order (as measured by the Attinà defense pact index), declining world economic growth (as measured by the rates of world industrial production growth), war intensity (that only leveled off in the 1990s in order to increase anew, see above) and rising world inequality (as measured by the rising world GINI inequality index, calculated by Schultz) have to be reconsidered. Our hypothesis is – also in view of developments beyond the 1990s – that the belle époque of globalization 1960–1990 did **not** bring about a more stable, egalitarian and peaceful world (see Graph 7: War intensity, growth, alliance stability and world income inequality 1960–1990).

What does all this mean in terms of the concept of the ‘**balance of power**’? To quote again from Colin S. Gray as perhaps the most influential strategist in the United States military apparatus:

(...) high-tech transformation will have only modest value, because war is a duel and all of America's foes out to 2020 will be significantly asymmetrical. The more intelligent among them, as well as the geographically more fortunate and the luckier, will pursue ways of war that do not test US strengths. Second, the military potential of this transformation, as with all past transformations, is being undercut by the unstoppable processes of diffusion which spread technology and ideas. Third, the transformation that is being sought appears to be oblivious to the fact claimed here already, that there is more to war than warfare. War is about the peace it will shape (Gray 2005: 20–21).

A model of a more inclusive global governance that accommodates major and economically already powerful Muslim nations like Indonesia, Turkey, Egypt, Bangladesh, Malaysia, and Morocco would quickly come to term with the problem of terrorism to which there seems to be no end in sight (see Graph 8: Global terrorism and the global political/economic cycle. Legend: our own compilations from the data quoted above and <http://www.state.gov/s/ct/rls/pgtrpt/2003/>).

CONCLUSION

This essay has shown that serious quantitative analysis cannot overlook the tragic W-pattern of global war that was already established by Joshua Goldstein in his doctoral thesis in 1988. New evidence seems to suggest that this cycle has not ended with the end of the cold war, and that preventive social action against 'the globalization of warfare' is needed to assure for us, for our children and our habitat a peaceful co-existence in the 21st century.

NOTE

¹ We cannot really enter here into the vast debate about human rights on global scale. Some notes should be permitted, nevertheless: since this article is only intended to show mega-trends in **quantitative terms**, it suffices to remind readers here of the fact that recent quantitative trends, based on Freedom House indicators, indeed are contradicting the liberal globalist optimism about the spread of 'human rights and democracy'. But in future, phenomena, such as **gender empowerment**, **gender development**, and **victimization by common criminality** could theoretically be included in future human rights statistics. Whether social policy related **infant mortality rates** in, say, the Bronx in New York or in West Virginia or New Orleans or environmental policy related infant mortality rates in, say, Archangelsk, Vyborg, Koryazhma, Novodvinsk, Sycktyvkaar, or Tcherepovetz should be included in future statistics of human rights or civil rights is another matter, not debated here. For reason of simplicity, our model uses here only the standard '**Freedom House**' data series, but some kind of methodological caution should be kept in mind in using this concept. A more sophisticated quantitative approach should also evaluate trends in **religious freedom**, **trade union freedom** etc. Taking all these indicators into consideration, the present author doubts whether the performance of countries like Russia over the last decade is as negative as 'Freedom House' portrays it.

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Table 1

**K-waves: the sequence of global leading sectors
according to Modelski**

K-wave	From about	Leading sector	Major innovation
K1	930	Printing, paper	Learning society, book printing
K2	990	National market formation	North-south market unification
K3	1060	Fiscal/administrative framework	Monetization, paper money
K4	1120	Maritime trade expansion	Compass, large junks
K5	1190	Champagne fairs	European market organized
K6	1250	Black Sea trade	Innovations from East Asia
K7	1310	Venetian galley fleets	New markets in North Europe
K8	1350	Pepper trade	Alexandria-connection institutionalized
K9	1430	Guinea gold	'Discovery' of African trade
K10	1494	Indian spices	Operating oceanic route
K11	1540	Atlantic, Baltic trades	American silver
K12	1580	Asian trade	Dutch East Indies Co. VOC
K13	1640	Amerasian trade	Plantations
K14	1688	Amerasian trade	Tobacco
K15	1740	Cotton, iron	Factory production
K16	1792	Steam, rail	New forms of transport
K17	1850	Electrics, chemicals, steel	Invention of invention
K18	1914	Electronics, autos, aerospace	New products
K19	1972	Information industries	Computers

K-20	2026		
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Table 2

The Co-evolution of Global Economics and Politics
according to Modelski

Approx Date	K-waves (global leading sectors)	Long cycles (world powers after 1500)
930	K1 Printing and paper	LC1 Northern Sung
990	K2 National market	
1060	K3 Fiscal framework	LC2 Southern Sung
1120	K4 Maritime trade	
1190	K5 Champagne Fair	LC3 Genoa
1250	K6 Black Sea trade	
1300	K7 Galley fleets	LC4 Venice
1360	K8 Pepper	
1430	K9 Guinea gold	LC5 Portugal
1492	K10 Indian spices	
1540	K11 Atlantic, Baltic	LC6 Dutch Republic
1580	K12 Asian trade (VOC)	
1640	K13 Amerasian trade	LC8 Britain I
1688	K14 Amerasian trade	
1740	K15 Cotton, iron	LC9 Britain II
1792	K16 Steam, rail	
1850	K17 Electrics, chemicals, steel	LC10 United States
1914	K18 Autos, air, electronics	
1972	K19 Information industries	

Legend for Table 1 and 2: quoted from George Modelski 2002, publicly available from:
<http://faculty.washington.edu/modelski/Evoweconomy.html>

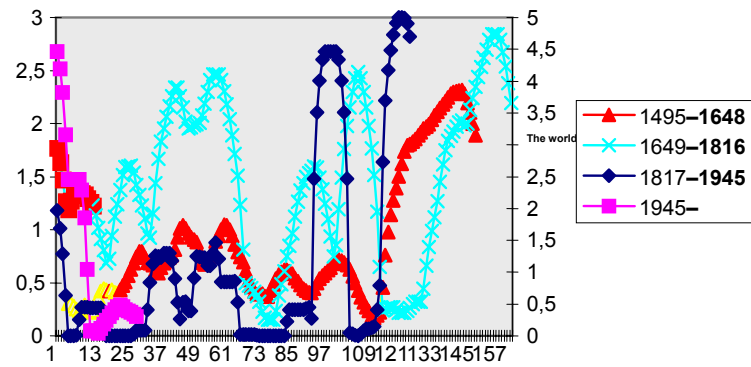
Table 3

Projected Logic of World Power Competition 1495-2002

Role in War	Thirty Years War	Napoleonic Wars	WW I+II
losing economic contender	Hapsburgs	France	Germany
new hegemon	Netherlands	Britain	United States
newly emerging challenger which was an economically decimated member of the winning coalition	France	Germany	China and Russia
past contender for systemic hegemony, joining the war effort of the winning coalition	Sweden	Hapsburgs, Portugal	France

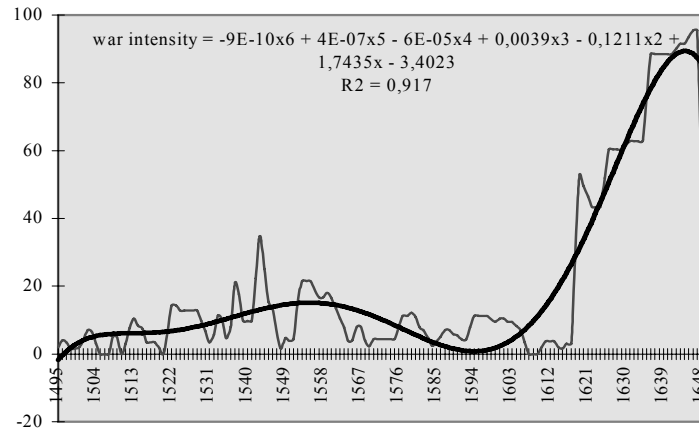
Source: our own compilations and projections, based on Tausch 1991 and 1997

The tendency towards war in the capitalist world economy, 1495–1975



Graph 1. War Intensity in the World System since 1495 and Global War Cycles 1495ff; 1649ff; 1817ff. and 1945ff.

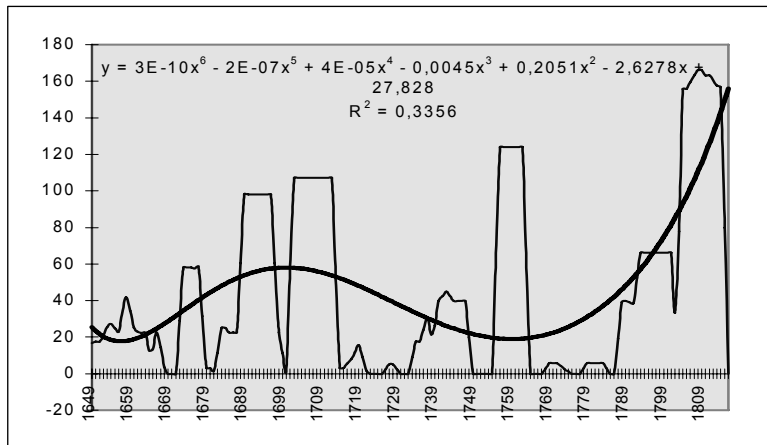
Legend: y-axis: war intensity in the world economy. x-axis: passage of time since the beginning of a world political cycle, starting points 1495, 1649, 1817 and 1945. Calculated with EXCEL from Goldstein's original data. War intensity = $\text{nat. logarithm from } (1 + \text{battle fatalities from great-power wars}^{0.10})$.



Graph 2a. War Cycles 1495–1975.

1495-1648: Evolution of Hapsburg-Versus-the-Rest Constellation; Genesis of the Thirty Years War

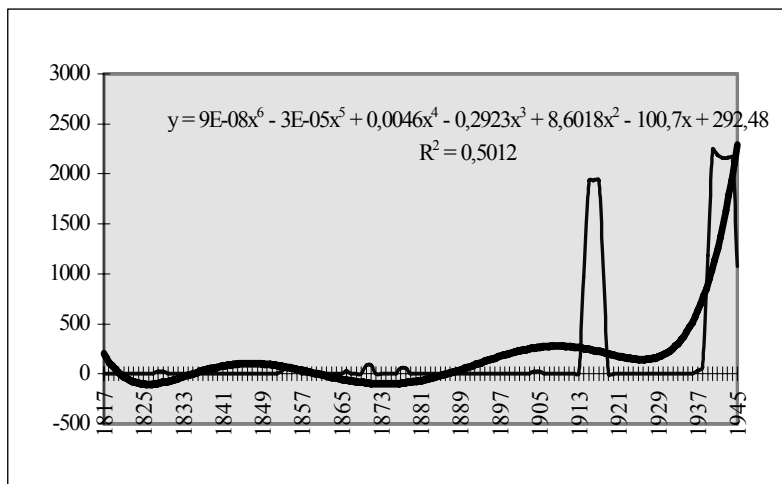
Legend: in this and in all following graphs and tables, very small decimal numbers are abridged according to established mathematical conventions, contained in the EXCEL routine. For example, the number 0,000141972 will be abridged to 1E-04, *i.e.* a decimal number rounded to 0,0001 and starting at the fourth number after the decimal point with three zeros after the comma. 9E-10 equals thus a decimal number with 9 zeros after the comma, *i.e.* 0,0000000009. The first regression slope is negative (thus the sign $-9E-10$), the second positive (thus the $+4E-07$). According to statistical practice, there are regressions using first order polynomial expressions (*i.e.* $y = a + b_1 \cdot x$), second order polynomial expressions (*i.e.* $y = a + b_1 \cdot x + b_2 \cdot x^2$), and so forth. In his classic essays, N. Kondratieff calculated by hand polynomial swings of the fifth and sixth order in the world economy. We keep to that tradition, and our above equation is a polynomial regression of the 6th degree, *i.e.* $y = a + b_1 \cdot x^6 + b_2 \cdot x^5 + b_3 \cdot x^4 + b_4 \cdot x^3 + b_5 \cdot x^2 + b_6 \cdot x$. The dependent variable is $y = \text{war intensity (untransformed)}$.



Graph 2b. War Cycles 1495–1975.

1649–1816: Evolution of the France-Versus-the-Rest Constellation:
Genesis of the Napoleonic Wars

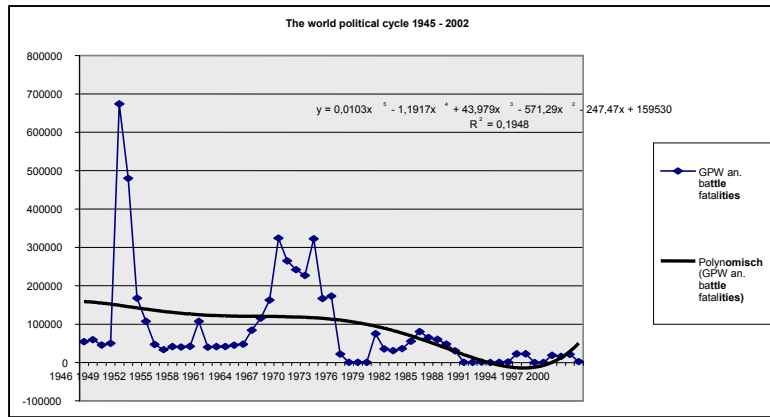
y = war intensity (untransformed)



Graph 2c. War Cycles 1495–1975.

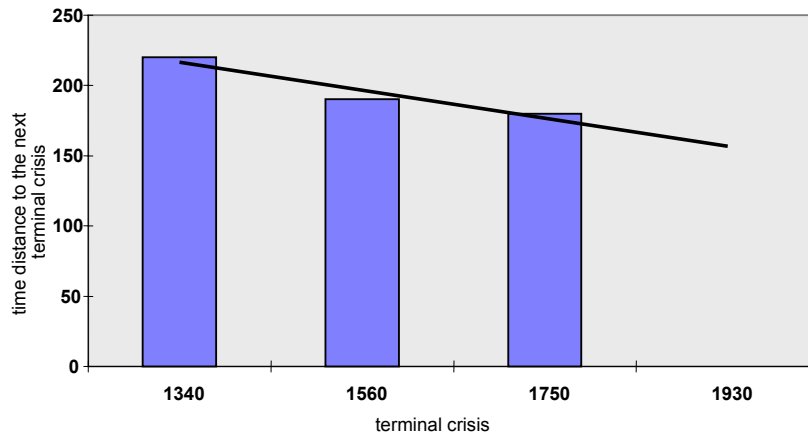
1817–1945: Evolution of the Germany Versus-the-Rest Constellation:
Genesis of German World Power Challenge

y = war intensity (untransformed)



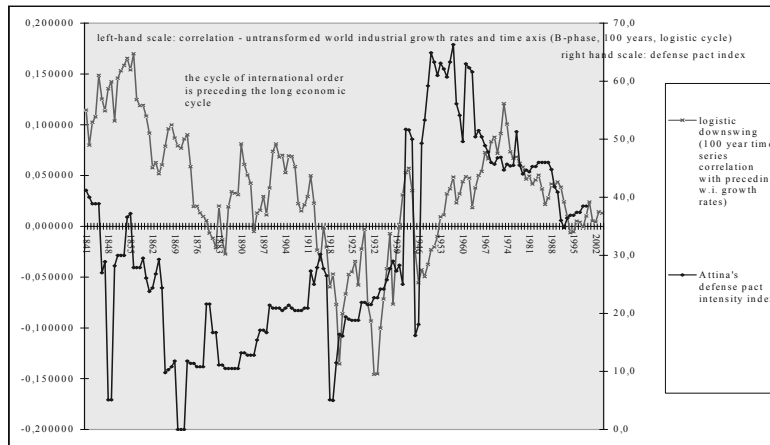
Graph 2d. War Cycles 1495–1975.
 1946–2002: Towards Delegation of Global Leadership by USA?
Legend: Polynomisch = polynomial expression of the 5th order
y = war intensity (untransformed)

The time distance between the terminal crises of Capitalism

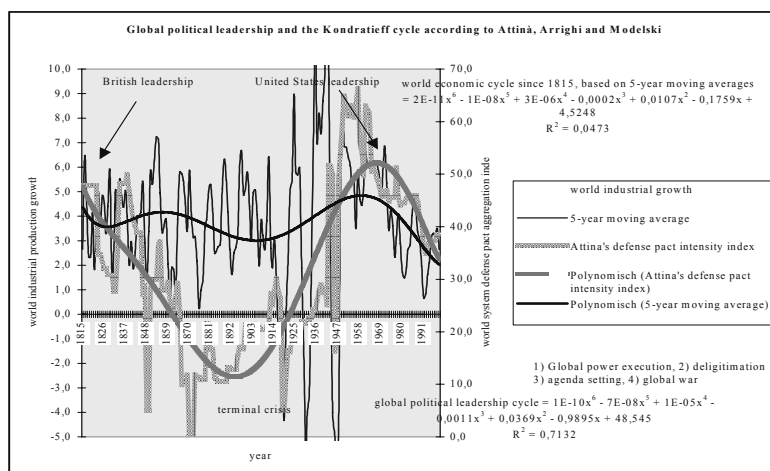


Graph 3. Terminal crises of capitalism
Source: our own compilation from Arrighi, 1995, and Tausch, 1998.
The above graph can be interpreted only as a very rough simplification. The left hand scale is measured in numbers of years that passed between one hegemonic crisis and the next one. The

simple linear trend would suggest that the next terminal crisis would happen somewhere in the 21st Century.



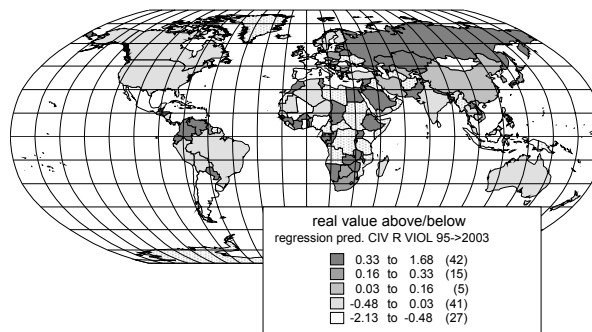
Graph 4a. Global political leadership and the long cycles of world development: declining growth rates and world political de-concentration – the evidence for the period after the Congress of Vienna 1814–1815



Graph 4b. Global political leadership and the long cycles of world development: world political de-concentration and economic stagnation (B-phases of 100 year logistic cycles in the tradition of Wallerstein) – the evidence for the period after the Congress of Vienna 1814–1815

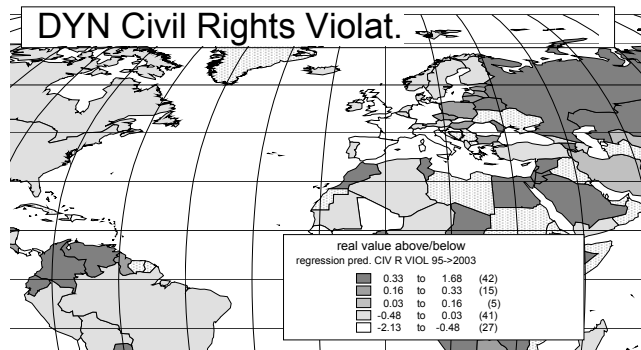
Legend: our own compilations and calculations, based on the cited works of Arrighi, Attina, Goldstein and Modelski, and UNIDO world industrial production data 1976–2004.

DYN Civil Rights Violat.



Graph 5a. The regions of the retreat of the respect for civil rights, 1995–2003. The evidence on a world level

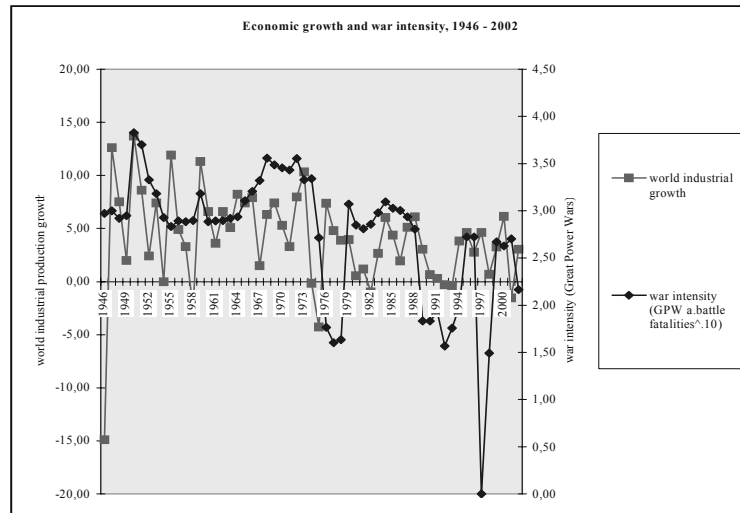
Legend: civil rights violations 2003, predicted by the level of civil rights violations, 1995. The dark zones are the countries, where the respect for civil rights (standard Western concept) diminished above the world trend during that period. Source: our own calculations from the Freedom House EXCEL table, available at <http://www.freedomhouse.org/ratings/allscore04.xls>



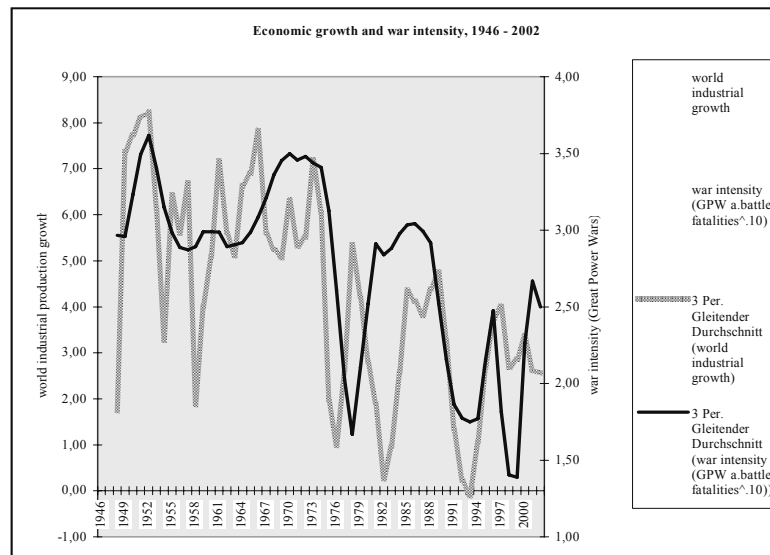
Graph 5b. The regions of the retreat of the respect for civil rights, 1995–2003. The evidence for the ‘North Atlantic arena’

Legend: civil rights violations 2003, predicted by the level of civil rights violations, 1995. The dark zones are the countries, where the respect for civil rights (standard Western concept) diminished above the world trend during that period. Source: our own calculations from the Freedom House EXCEL table, available at

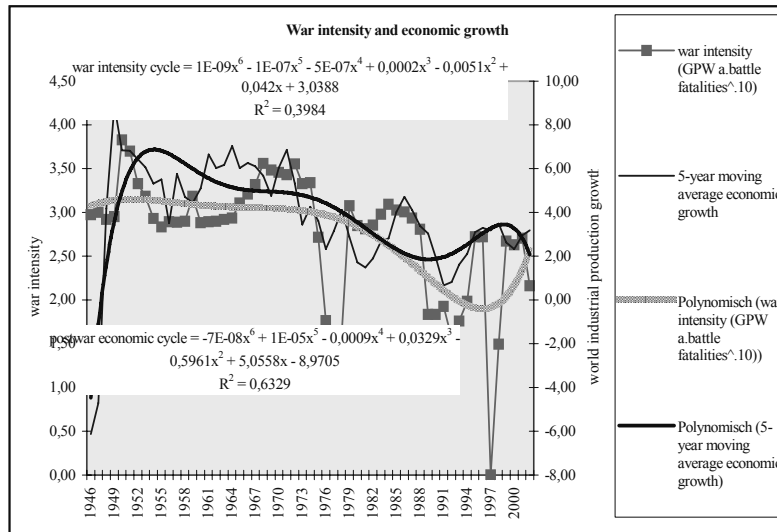
<http://www.freedomhouse.org/ratings/allscore04.xls>



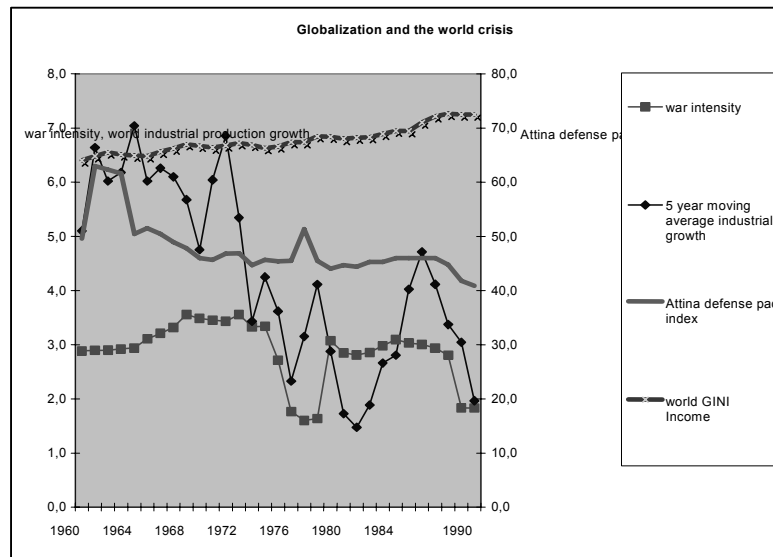
Graph 6a. War intensity and world industrial production growth since 1946. The original data



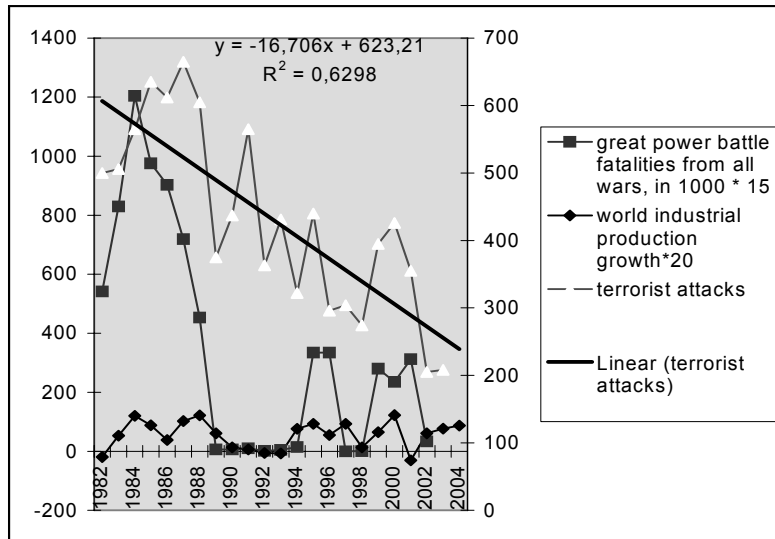
Graph 6b. War intensity and world industrial production growth since 1946. Three-year sliding averages



Graph 6c. War intensity and world industrial production growth since 1946. The stylized relationships over time



Graph 7. War intensity, growth, alliance stability and world income inequality 1960–1990



Graph 8. Global terrorism and the global political/economic cycle
Source: Global economics and conflict data Tausch, 2007; data on global terrorism: United States Department of State, available at: <http://www.state.gov/s/ct/rls/crt/2003/>