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From the Oil Crisis to the Great Recession:

Five crises of the world economy

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ABSTRACT — This essay makes the case that the global economy has gone through five crises since the 1970s to the present. This implies not only that the world economy is a real entity, but also that the usual view that poses national economies as units of economic analysis is an approach with major limitations. The paper discusses the concept of economic crisis and provides data indicating that the world economy, not national economies, is the major unit to be analysed when trying to understand the economic reality of our time, and particularly the reality of crises. These crises are discrete, countable phenomena, distinctive states of an entity that can be properly called world economy, or world capitalism. The main feature of a crisis is the temporary interruption of capital accumulation. Data on capital formation, on growth of the world output, of monetary aggregates, of unemployment rates, and on world industrial activity (as indicated by a "chemical index") demonstrate five major "dips" of the global economy, i.e., world recessions or crises, in (*i*) the mid 1970s, (*ii*) the early 1980s, (*iii*) the early 1990s, (*iv*) the early 2000s, and (*v*) the Great Recession that provisionally can be dated 2007-2009. To a large extent, business-cycle chronologies of national economies such as those produced by the NBER or other institutions are largely consistent with these five crises of the world economy which, obviously, had different manifestations in different nations and economic regions.

Introduction

According to Immanuel Wallerstein social scientists

> of all kinds like to designate turning points. It is a device that clarifies immensely the story they are trying to tell. It becomes a basic building block of their analyses of the immediate phenomena they are studying. The choice of turning points constitutes a basic framework within which we all operate. But choosing different turning points can change entirely the logic of the analyses. What are considered to be the "turning points" can mislead as readily as they can clarify.[2]

This article makes the case that there have been five crises of the world economy during the past four decades. The assertion that an entity called "world economy" has had five crises since the 1970s provides key insights into the basic dynamics of economic and social conditions, and through them, into a variety of issues worthy of consideration in social science.

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[2] Immanuel Wallerstein, *Modern World-System III: The Second Era of Great Expansion of the Capitalist World-Economy, 1730s-1840s* (Berkeley: University of California Press, 2011), p. *xiii*.

Modern discussions about the Great Recession in particular or economic crises in general often turn to empirical data, immediately focusing on national statistics on national income, unemployment, financial markets, or other economic indicators. In this way the assumption is made, often implicitly, that the discussion about economic crises must refer to a unit of analysis that cannot be other than a national economy.[3] Furthermore, and this is more common in the heterodox economic literature, perhaps following Marx's reluctance to definitions, it appears as if everybody knows what a crisis is, and there would be no need to waste time and words in defining it. The concept of crisis to be used will thus be the one that the author of the analysis likes to use. Of course, as always there are exceptions to the pattern.

Stimulated by the world financial crisis that erupted in 2008, a number of recent papers and books have tried to generate an inventory of crisis, usually focusing on finance and banking. In *Misunderstanding Financial Crises,* Gary Gorton has explained that identifying crises or, what to a large extent is the same, setting a chronology in which the start and the end of the crises is established, are relatively controversial issues in mainstream economics.[4] Gorton cites studies by IMF economists Laeven and Valencia, by the now famous (or infamous) Reinhardt and Rogoff, and by Bordo et al. While Laeven and Valencia refer to 124 systemic banking crises over the period 1970-2007, in *This Time is Different* Reinhardt and Rogoff consider a period of several centuries in which the "advanced economies" of Britain, the United States, and France had respectively 12, 13 and 15 banking crisis episodes. But they conclude that the frequency of crises declined in the post-WWII period. Writing in 2001, long before the big crash of 2008,

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[3] I am myself guilty of this sin. My papers "Statistical Evidence of Falling Profits as Cause of Recession: A Short Note" (*Review of Radical Political Economics* 44, no. 4, 2011, pp. 484-493), and "Does investment call the tune? Empirical evidence and endogenous theories of the business cycle" (*Research in Political Economy* 28, 2013, pp, 229-259) and most of the analyses in the book *La Gran Recesión y el capitalismo del siglo XXI* that I coauthored with Rolando Astarita (Madrid: Catarata, 2011) use national data. Of course, the idea that in studying economic issues the proper unit of analysis must be the national economy has a long tradition coming back to Kuznets, who claimed that "if the study of economic growth is oriented to policy problems, the study should be centered on units that possess the major policy-making power" (Simon Kuznets, *Modern economic growth: Rate, structure, and spread* (New Haven: Yale University Press, 1966, p. 17).

[4] Gary Gorton, *Misunderstanding financial crises: Why we don't see them coming* (New York: Oxford University Press, 2012).

Bordo et al. examined the period 1880-2000, concluding that the frequency of financial crises since 1973 had been "double that of the Bretton Woods and classical gold standard periods and is rivaled only by the crisis-ridden 1920s and 1930s." But they found "little evidence that crises have grown longer or output losses have become larger," a conclusion that probably would generate some amusement after 2008.

Luc Laeven and Fabián Valencia have recently updated their inventory of crises.[5] They conclude that during the period 1970-2011 there were 146 *banking* crises, 218 *currency* crises, and 66 episodes of *sovereign debt* crisis and debt restructuring. The authors provide careful formal definitions of each type of crisis, but in any of the three types the basic characteristic is financial stress due to inability of private financial enterprises or government institutions to face due payments, which leads to more or less general bank runs and liquidations (*banking crisis*), devaluation of the national currency (*currency crisis*) or sovereign debt defaults (*sovereign debt crisis*). Laeven and Valencia maintain that these three types of crises often overlap in a "twin" or "triplet" crisis, i.e., a period in which two or three of these types of financial crisis occur at the same time.

In many countries there were banking crises in 2008, but for Laeven and Valencia, problems in the financial sector reached levels of intensity sufficient to classify them as systemic banking crises only in later years, concretely 2009 for Denmark, Germany, Greece, Ireland, Mongolia, and Ukraine; 2010 for Kazakhstan; and 2011 for Nigeria and Spain. Though obviously Laeven and Valencia focus on national economies as the units in which crises can occur, they accept that, for instance, some banking crises "do not originate domestically but are imported from abroad when foreign subsidiaries of domestic banks get in trouble."

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[5] Luc Laeven and Fabián Valencia, *Systemic Banking Crises Database: An Update* (Washington, DC: International Monetary Fund, 2012).

For Reinhart and Rogoff, financial crises occur in waves,[6] and Laeven and Valencia agree. Laeven and Valencia plot the annual starts of national banking crises over the past four decades (see figure 1). A large peak of "crisis activity" appears in 2008, but the rest of the crises are loosely distributed; from 1980 to the late 1990s there are many crises, with only the mid 1980s and the last two years of the century showing financial calm. Clear peaks of crisis activity are located in the mid 1970s and the early 1980s, and in three clusters during the 1990s, corresponding to the crises of the transition economies, of Latin American countries during the so-called Tequila crisis, and of East Asian countries during the Asian financial crisis. Laeven and Valencia refer to "crisis cycles," explaining that they "frequently coincide with credit cycles"—of 129 banking crises episodes for which credit data are available, 45 episodes were preceded by a credit boom.

All of the former is focused on the financial sector, leaving aside the real economy. However, in *Misunderstanding Financial Crises* Gary Gorton affirms that financial crises "are an integral part of business cycles" (p. 74). Gorton, for whom the 2008 financial crisis in the United States was to a large extent a bank panic on the market of sale-and-repurchase securities (the REPO market), bank runs and panics "are not irrational events. Panics happen when information arrives about a coming recession. It is the fact that there are potential problems with banks that causes a run" (p. 5). That is patently true; financial crises have always had as a precedent and underlying cause disturbances in the real economy, as it was noted a century ago by Wesley Mitchell and even before that by Karl Marx.[7]

In this paper I argue that there have been five crises of the world economy from 1970 to the present. The one-hundred-and-some financial crises counted by different observers in recent

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[6] Carmen M. Reinhart and Kenneth S. Rogoff, *This time is different: Eight centuries of financial folly* (Princeton: Princeton University Press, 2009).

[7] Wesley Clair Mitchell, *Business cycles* (Berkeley: University of California Press, 1913); Karl Marx, *Capital: A critique of political economy* (Vol. 3, ed. by Friedrich Engels [1894], transl. by D. Fernbach, London: Penguin Books, 1981).

years are just the national materializations of five large downturns in world economic activity, which obviously had manifestations in the financial sphere.

The assertion that there have been five crises of the world economy since the 1970s to the present implies that these crises are discrete, countable phenomena representing distinct states of an entity that can be properly called world economy, or global economy. In the same way that a human body is not just an aggregation of four limbs, a trunk, and a head, the global economy is not only the aggregation of the two-hundred-and- some national economies of the world. To count and to measure are two basic endeavors of science. But to count something, first we need to be clear what is to be counted. This is important because for those who criticize the social reality with the purpose of transforming it, it is imperative to avoid getting entangled in fuzzy reasoning and logical contradictions that weaken their stance.

Conceptual issues re the characterization of crises will be discussed later in the paper. To start, let's first look at the evidence that supports the existence of an entity that can be properly called world economy and which has gone through five crises from the 1970s to the present.

Evidence of five crises of the world economy

For the half-century period since 1960, data for world economic output measured in money terms, which I will abbreviate WGDP (for world GDP), are available from the World Bank.[8] As a share of WGDP, annual fixed capital formation—investment in fixed capital in more common terminology—has oscillated between levels of 19% and 24%, while total capital formation has ranged between 19% and 26% (figure 2). The lowest levels of capital formation were reached in 2009, during what has been called Great Recession or global financial crisis, when both total and fixed capital formation reached their lowest values, a little above 19% of WGDP. The

[8] Except in some cases that will be indicated, data used in this investigation are from the World Development Indicators (WDI) database of the World Bank, available at data.worldbank.org.

greatest levels were observed in the early 1970s, when total capital formation more than a quarter of WGDP.

There are five obvious dips of investment—in the mid 1970s, the early 1980s, the early 1990s, the early 2000s, and 2007-2009. From the classical descriptions of Wesley Mitchell and Jan Tinbergen[9] it is known that drops in investment are a major characteristic of what have variously been called economic crises, downturns, contractions, recessions, or depressions. While both consumption and investment fall in the recession phase of the business cycle, the drop in investment is much more pronounced than the reduction in consumption.[10]

As estimated in real terms, during the 50 years between 1960 and 2010, WGDP grew at a mean annual rate of 3.5%, with the fastest growth, 6.4%, in 1964, and the lowest growth and only contraction, in 2009, during the Great Recession, when the global output "grew" by –2.3% (figure 3). In 2008, the rate of WGDP growth had already dropped to 1.4% after several years of growth rates around 4%. In the mid-1970s there had been also a major dive in the rate of growth of the global economy, which declined more than 5 percentage points, from 6.6% in 1973 to 1.0% in 1975. In 1982 the rate of WGDP growth dropped again, to almost zero (0.4%), and during the early 1980s the annual rates of growth were 1% or less, much lower than in the late 1970s, when WGDP increased at annual rates between 4% and 5%. Drops in the WGDP growth rate also occurred in 1991-1993, and in 2001-2002. It is clear that drops in the growth of WGDP coincide with or immediately precede periods of falling capital formation. Investment data and growth of total output both suggest contractions of the world economy in the mid-1970s, early 1980s, early 1990s, early 2000s, and 2008-2009 (figures 2 and 3).

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[9] Mitchell, *Business cycles,*; Jan Tinbergen, *Statistical Testing of Business-Cycle Theories: Volume I - A Method and its application to Investment Activity* (Geneva: League of Nations, 1939); Jan Tinbergen, *The dynamics of business cycles: A study in economic fluctuations* (translated from the Dutch and adapted by J. J. Polak, Chicago: University of Chicago Press, 1950).

[10] Wesley C. Mitchell, *What happens during business cycles: A progress report*, ed. Arthur F. Burns (New York: National Bureau of Economic Research, 1951); Howard J. Sherman and David X. Kolk, *Business cycles and forecasting* (New York: Addison-Wesley, 1997).

Since 1970, in the chronology of the National Bureau of Economic Research (NBER) there were six recessions in the U.S. economy starting in 1973, 1980, 1981, 1990, 2001, and 2007. Putting together the two contiguous recessions of 1980 and 1981, the five periods in which data show significant downturns of the global economy coincide with the dates in which according to the chronology of the NBER there were "recessions of the U.S. economy." This is not surprising, considering that the United States is still the biggest national component in the world economy. But it does not seem appropriate to consider that we are looking at crises of the U.S. economy which, being the largest component of economic activity in the world, therefore are also revealed in aggregated data at the world level. That this interpretation is not proper is suggested by the fact that a variety of national economic indicators support the five-crises case.

For instance, national unemployment rates show that, in the early 1990s, joblessness grew quickly in such different countries as Australia, South Korea, Iceland, Austria, Canada, Portugal, Sweden, and the United States (figure 4). Generalized increases in unemployment rates were observed also in the early 1980s, and in 2007-2009. In the mid 1970s and around the turn of the century, unemployment rates grew in a less pronounced and less coincidental manner across countries, but there was also a general tendency for unemployment rates to increase around these years. It is known, for instance, that unemployment rates in many Western European countries rose quickly in the mid 1970s.

Since a basic characteristic of capitalism is to be a money economy, monetary disturbances are always part of economic crises. The evolution of monetary aggregates also suggests that the world economy has gone through five crises since the 1970s. M2, which basically corresponds to money bills in circulation and demand bank accounts, is the only monetary aggregate reported by the World Bank for the world economy. Measuring it as compared with WGDP in the ratio m = M2/WGDP (figure 5), it is obvious that a rapid expansion of m announces the crisis, while during the crisis itself, m suffers a serious contraction. In 1980, m contracted to 66% after it had reached 72% in 1975; and in 1992 it shrank to 89% after peaking at 93% three years earlier.

There was also a significant expansion and shrinkage of *m* before and during the Great Recession, as *m* reached 111% in 2006, 113% in 2007, 118% in 2008, and 129% in 2009, then declined to 110% in 2010. [11]

Evidence reinforcing the chronology that indicates five crises of the global economy from the 1970s to the present can be inferred from the series of global emissions of carbon dioxide (CO_2), a variable that, to my knowledge, has never been used as an economic indicator. The volume of global emissions of CO_2 has been estimated for the past 60 years by the Carbon Dioxide Information Analysis Center (CDIAC), the primary climate-change data and information analysis center of the U.S. Department of Energy.[12] CDIAC estimates global emissions of CO_2 from economic data on production, consumption, and trade of fossil fuels, cement, etc. Since at the global level net trade is zero, errors in estimating trade of fuels may introduce error when estimating national emissions, but they are irrelevant to the estimation of global emissions. Starting in 1960, when the earliest estimates are available, the series shows a monotonic increase in the annual emissions of CO_2 (figure 6). The almost linear increase is interrupted, however, precisely in the mid-1970s, the early years of the next three decades, and 2008; that is, during the same periods in which both capital formation and total global output significantly decay. Natural scientists studying the dynamics of climate change have referred to these five periods in which CO_2 emissions ceased growing using terms that they took from the economic and financial literature. Thus, geoscientists referred to the mid-1970s as the Oil Crisis, the early 1980s as the Savings & Loans Crisis, the early 1990s as the Soviet Bloc Collapse, the turn of the century as the Asian Financial Crisis, and finally, in 2008-2009, they found the famous Great Recession or Global Financial Crisis coinciding with a big dip in the emissions of CO_2.[13] That the

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[11] See appendix 1 for an econometric test of the hypothesis that "money leads." Appendix 2 describes how the World Bank dramatically changed its estimates for *m* in the years around the Great Depression.

[12] Data can be downloaded from cdiac.ornl.gov.

[13] Glen P. Peters et al., "Rapid growth in CO_2 emissions after the 2008-2009 global financial crisis," *Nature Climate Change* 2, no. 1 (2012): 2-4.

annual emissions of CO_2 are strongly correlated with world economic output is revealed with dazzling clarity simply by plotting the absolute annual growth of both variables (figure 7).[14]

A narrative account of the various manifestations of these five crises is beyond the scope of this article. It can be said, though, that the crisis of the mid-1970 coincided with the Yon-Kippur War, was blamed on the OPEP embargo, and was baptized as the Oil Crisis—more on this later. In the crisis of the early 1980s, unemployment rates reached two-digit or even higher levels in many major economies (figure 4), rates not seen since the Great Depression of the 1930s, exceeded only in recent years. In the crisis of the early 1990s the breakdown of the USSR and the melting of the economies of the old Soviet bloc was a major contributor to the economic downturn in those Western countries that were major trade partners of the Soviet Union. In Finland, where a large share of its exports were going to the USSR, the early 1990s downturn was so severe that unemployment rates that had been below 5% in 1988-1990 rose over 16% in 1993 and 1994. It would not be difficult to argue that the global crisis around the turn of the century was the least well-defined, since its manifestations were distributed along several years, with the national crises starting in 1997-1998 and extending to 2001 and beyond. According to Laeven and Valencia, banking crises occurred in this period in Russia (1998), Korea (1997-1998), Indonesia (1997-2001), Malaysia (1997-1999), Thailand (1997-2000), and the Philippines (1997-2001). I argue that the Argentinian crisis that erupted in 2001 and, according to Laeven and Valencia, extended to 2003, was part of the global recession, and the same could be said about the crisis in Uruguay in 1999-2003. Mexico went through a banking crisis between 1994 and 1996, the Czech Republic between 1996 and 2000, Jamaica between 1996 and 1998, China in 1998. Laeven and Valencia recognize that these crises were always associated with “output

[14] The growth of WGDP is also significantly correlated with the annual increases of atmospheric concentrations of CO_2—which are not estimated from economic data, but directly *measured* from air samples. To show that correlation, however, requires more complex statistical techniques (J. A. Tapia Granados, E. L. Ionides, and Ó. Carpintero, "Climate change and the world economy: short-run determinants of atmospheric CO2," *Environmental Science & Policy* 21 (2012): 50-62.).

loss," which is to say that they were actually general economic crises, not only financial crisis. It is defensible to argue that the entire 1990s was a decade of economic crisis, but the fact that decays in investment and drops in output growth concentrate strongly around the beginning and the end of the decade when, furthermore, they coincide with banking crises in many countries, argues in favor of locating world economic crises around the beginning of the decade and the turn of the century. There are also major decays in industrial activity and trade in the early 1990s and at the turn of the century as indicated by the drops in CO_2 emissions (figure 6).

An important aspect of the periods of expansion in the 1980s and later was the transformation of the ethnic composition of the population in many high-income countries by the procyclical inflow of immigrants from Africa, Asia, Latin America and Eastern Europe. Populations that until the 1970s had been more or less ethnically and religiously homogeneous (e.g., those of Sweden, Spain, or Australia) were transformed by the influx of foreign-born workers that now form important minorities.

The concept of crisis

As a leader of empirical economic research, the now almost forgotten Wesley C. Mitchell stands out for his effort to introduce rigor and accuracy to the analysis of business cycles based on observational data.[15] In *Business Cycles* (1913) and *Business Cycles—The Problem and Its Setting* (1927), Mitchell meticulously discussed how different authors had understood the phases of "the business cycle"—a term that had had many former incarnations including crisis cycle, trade cycle, industrial cycle, cycle of prosperity and depression, cycle of prosperity and crisis, among others. Mitchell clarified that authors such as Aftalion had used the term crisis to mean simply the transition from the phase of prosperity to that of depression, while others, such as Bounatian, had used it to sense mean severe disruption of economic life, with significant

[15] In spite of criticisms from Keynesian, neoclassical, and even some Marxist economists who accused him of being atheoretical, Mitchell described changes in production, distribution and finance that in his view integrate an endogenous development of the phases of the business cycle. In my view this amounts to a theory of the cycle.

numbers of firms under major stress or failing. For Mitchell, in the transition from prosperity to depression such disturbances occur frequently, but not always, and for that reason he concluded that the term *crisis* is not appropriate in referring to one of the phases of the cycle. For authors who were attached to the word, Mitchell recommended assigning *crisis* the more neutral meaning used by Aftalion, which implies a transition from a period of prosperity to a period of depressed economic conditions.[16]

Before Mitchell, few economists in the 19th century were interested in "the business cycle" as a more or less periodical alternation of prosperity and depression.[17] Adam Smith, David Ricardo, John Stuart Mill, and others used a variety of terms including *trade revulsion*, *commercial panic*, *glut of markets*, or *commercial crisis*, as meaning financial panics during periods of commercial stress or periods of deepest depression when many factories closed. Economists generally considered these to be mostly isolated events limited to particular markets, and subscribed to the idea of Jean-Baptiste Say, who denied that a "glut," that is, overproduction, could be general affecting all markets. Marx disagreed with these views, and references to overproduction and crisis are common in his writings, though they are widely scattered (the opinion that Marx never produced a complete theory of crisis is commonly accepted).[18] In Marx's view the evolution of capitalism—though Marx used such terms as "the factory system" or "the bourgeois economy"—is basically a succession of periods of accumulation of capital separated by crises, in an alternating process that he called "industrial cycle," or "crisis cycle."[19] As Marx explained in *Capital*, the factory system's enormous capacity

> for expanding with sudden immense leaps, and its dependence on the world market, necessarily give rise to the following cycle: feverish production, a consequent glut of the market, then a contraction of the market, which

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[16] Mitchell, *Business cycles;* W. C. Mitchell, *Business Cycles: The Problem and its Setting* (New York: National Bureau of Economic Research, 1927), especially pages 378-382

[17] Mary S. Morgan, *The history of econometric ideas* (Cambridge: Cambridge University Press, 1990), p. 15.

[18] Joseph Alois Schumpeter, *History of economic analysis* (New York: Oxford University Press, 1954); Alfredo Medio, "Trade cycle," in *The New Palgrave—A dictionary of economics*, eds. John Eatwel, Murray Milgate and Peter Newman (New York: Macmillan, 1987), 666-671.

[19] Simon Clarke, *Marx's theory of crisis* (New York: St. Martin's Press, 1994); Paul Mattick, *Economic crisis and crisis theory* (White Plains, NY: Sharpe, 1974).

> causes production to be crippled. The life of industry becomes a series of periods of moderate activity, prosperity, over-production, crisis and stagnation. The uncertainty and instability to which machinery subjects the employment, and consequently the conditions of existence, of the operatives becomes a normal state of affairs, owing to these periodic turns of the industrial cycle.[20]

The industrial cycle Marx was thinking of was something that went up and down every few years, not every few decades or every few centuries. Otherwise, the corresponding "uncertainty and instability" would be of little concern for "the operatives" who take care of the machinery as the only means to gain a living.

Marx viewed the mode of production based on the hegemony of capital as a world system and his analysis of long-term trends was based on the abstraction of a capitalist market extended to the whole world, so that the unit to be analyzed is a unique world economy. He was not shy, however, about looking at concrete economic data belonging to the national economies of his time. In the 1850s and 1860s Marx often considered the dates in which commercial crises had began in England and other countries. In the only volume of *Capital* published by Marx—in 1867— he proposed that crises had a decennial periodicity, but he and Engels before him seem to have ruminated long time on the issue. Thus, in "The Principles of Communism," written in 1847 and then used as preparatory material for the *Manifesto of the Communist Party*, Engels wrote that since the beginning of the century the condition of industry had

> constantly fluctuated between periods of prosperity and periods of crisis; nearly every five to seven years, a fresh crisis has intervened, always with the greatest hardship for workers, and always accompanied by general revolutionary stirrings and the direct peril to the whole existing order of things.

In his speech to the Democratic Association of Brussels at its public meeting of 1848, "On the Question of Free Trade," Marx referred to "the average period of from six to seven years [...] during which modern industry passes through the various phases of prosperity, overproduction, stagnation, crisis, and completes its inevitable cycle." But then in the *Manifesto*—published as an anonymous text the same year—the two friends referred to "periodical convulsions" and

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[20] Karl Marx, *Capital - A critique of political economy* [1867] (Vol. I, transl. by B. Fowkes, New York: Vintage Books, 1977), ch. 15, pp. 581-582.

"commercial crises that by their periodical return put the existence of the entire bourgeois society on its trial," but they did not give any specific periodicity for "the cycle."

In 1852, when the British economy was booming, Marx wrote in a piece for the *New-York Daily Tribune* that modern industry and commerce

> pass through periodical cycles of from 5 to 7 years, in which they, in regular succession, go through the different states of quiescence — next improvement — growing confidence — activity — prosperity — excitement — over-trading — convulsion — pressure — stagnation — distress — ending again in quiescence.

Explaining that "the most superficial knowledge of commercial history from the beginning of the 19th century, suffices to convince anybody that the moment is approaching when the commercial cycle will enter the phase of excitement, in order thence to pass over to those of over-speculation and convulsion," Marx made fun of "Bourgeois optimists" who at the time were claiming this time would be different and the prosperity would not end in crisis. The phase of excitement of commence, Marx wrote, "is only the precursor of the state of convulsion. Excitement is the highest apex of prosperity; it does not produce the crisis, but it provokes its outbreak."[21]

Thus, in 1852 Marx predicted an approaching crisis which indeed began in 1854. Writing in January 1855 for the *Neue Oder-Zeitung,* he referred to the years 1825, 1836, 1847 and 1854 as turning points in which "the commercial cycle has again reached the point where overproduction and overspeculation turn into a crisis".[22] The same month, this time in the *New-York Daily Tribune,* Marx referred with mockery to the prevalent views of "free-traders" (economists and businessmen, presumably) on the crisis:

> One cannot be astonished at the endeavor of the professional free-traders of Great Britain to show that the present crisis, instead of flowing from the natural working of the modern English system, and being altogether akin to the crises experienced at periodical intervals almost since the end of the 18th century, must, on the contrary, proceed from accidental and exceptional circumstances. According to the tenets of their school, commercial crises were out of the question...[23]

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[21] Karl Marx, "Pauperism and Free Trade—The approaching commercial crisis" [1852], in *Karl Marx & Frederick Engels Collected Works*, Vol. 11 (London: Lawrence & Wishart, 1980), pp. 357-363.
[22] Karl Marx, "The crisis in trade and industry" [1855], in *Karl Marx & Frederick Engels Collected Works*, Vol 13 (Lawrence & Wishart, 1980), pp. 571-578.
[23] Karl Marx, "The commercial crisis in Britain" [1855], in *Karl Marx & Frederick Engels Collected Works*, Vol. 13 (London: Lawrence & Wishart, 1980), pp. 585-589.

Four years later, while developing the materials that eventually were published in *Capital,* Marx was still thinking over the periodicity of "the cycle." On March 2, 1858, he wrote from London to his entrepreneur-consultant:

> Can you tell me how often machinery has to be replaced in, say, your factory? Babbage maintains that in Manchester the bulk of machinery is renovated on average every 5 years. This seems to me somewhat startling and not quite trustworthy. The average period for the replacement of machinery is one important factor in explaining the multi-year cycle which has been a feature of industrial development ever since the consolidation of big industry.

On March 4, Engels replied from Manchester:

> As to the question of machinery, it's difficult to say anything positive; at all events Babbage is quite wrong. The most reliable criterion is the percentage by which a manufacturer writes down his machinery each year for wear and tear and repairs, thus recovering the entire cost of his machines within a given period. This percentage is normally 7 1/2, in which case the machinery will be paid for over 13 1/3 years by an annual deduction from profits […] Now, 13 1/3 years is admittedly a long time in the course of which numerous bankruptcies and changes occur; you may enter other branches, sell your old machinery, introduce new improvements, but if this calculation wasn't more or less right, practice would have changed it long ago. Nor does the old machinery that has been sold promptly become old iron; it finds takers among the small spinners, etc., etc., who continue to use it. We ourselves have machines in operation that are certainly 20 years old […] Moreover, in the case of most machines, only a few of the components wear out to the extent that they have to be replaced after 5 or 6 years. And even after 15 years, provided the basic principle of a machine has not been superseded by new inventions, there is relatively little difficulty in replacing worn out parts […] Babbage's assertion is so absurd that were it true, England's industrial capital must continually diminish and money simply be thrown away. A manufacturer who turns over his capital 5 times in 4 years, hence 6 1/4 times in 5 years, would, in addition to his average profit of 10%, have to earn annually a further 20% on approximately 3/4 of his capital (the machinery) if he was to recoup without loss his outlay on the old machinery—i.e. would have to make 25%. This would, of course, vastly increase the cost price of all articles—more, almost, than it would be increased by wages in which case where is the advantage of machinery? […] Ten to twelve years are enough to bring about changes in the character of the bulk of machinery, thereby necessitating its replacement to a greater or lesser extent. The period of 13 1/3 years will vary, of course, depending on bankruptcies, breakage of essential parts where a repair would prove too expensive, and similar contingencies, so one could make it a bit shorter. But certainly not less than 10 years.[24]

The first volume of *Capital* was published nine years later, in 1867, but Engels' suggestions in this letter of 1858 seem to have been accepted by Marx. Thus, he wrote in *Capital* that to the extent that the durability of fixed capital develops with the development of the capitalist mode of production,

> so also does the life of industry and industrial capital in each particular investment develops, extending to several years, say an average of ten years. If the development of fixed capital extends this life, on the one hand, it is cut short on the other by the constant revolutionizing of the means of production, which also increase steadily with the development of the capitalist mode of production. This also leads to changes in the means of production; they constantly have to be replaced, because of their moral depreciation, long before they are physically exhausted. We can assume that, for the most important branches of large-scale industry, this life cycle is now on average a ten-year one. *The precise figure is not important here*. The result is that the cycle of related turnovers, extending over a number of years, within which the capital is confined by its fixed component part, is one of the material

[24] The *Manifesto* and the letters cited can be found for instance at www.marxists.org.

> foundations for the periodic cycle in which business passes through successive periods of stagnation, medium activity, overexcitement and crisis. The periods for which capital is invested certainly differ greatly, and do not coincide in time. But a crisis is always the starting-point of a large volume of new investments. It is also, therefore, if we consider the society as a whole, more or less a new material basis for the next turnover cycle.[25]

Marx never developed this vague idea of a decennial crisis cycle based on the period of renovation of fixed capital.[26] A century and a half later, we should consider the 10-year "cycle" as a poor approximation to the economic reality of capitalism, since one of the major characteristics of the "cycle" that appears clearly in the empirical data of two centuries is its irregular character that makes both expansions and recessions as well as the whole "cycle" quite variable in length.[27] It is interesting, however, that the decennial periodicity of crisis seems to have been a view shared by other authors at the time. Thus in a communication to the Manchester Statistical Society, John Mills—a friend of Jevons—referred in 1868 to commercial and credit disturbances showing "with a striking uniformity in the period of their occurrence" a decennial wave:

> It is an unquestionable fact that about every ten years there occurs a vast and sudden increase of demand in the loan market, followed by a great revulsion and a temporary destruction of credit. In the present century six of these events have been distinctly marked. In 1815-6, 240 country banks failed; in 1825, 70 banks shared the same fate; in 1836-9 a similar revulsion took place […] and of what occurred in 1847, 1857 and 1866 I scarcely need remind you…

Mills concluded that the ten-year periodicity of commercial crisis was an undeniable fact.[28]

In *Capital* and many other places where he referred to the industrial cycle, Marx used the terms *crisis*, *depression*, *glut*, *collapse*, or *stagnation of trade* more or less loosely with similar meaning, all of them referring to periods in which the process of accumulation of capital stops. These moments of crisis must be brief, since they "are never more than momentary, violent solutions for the existing contradictions, violent eruptions that reestablish the disturbed balance

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[25] Karl Marx, *Capital—A critique of political economy* (Vol, 2, ed. by Friedrich Engels [1885], transl. by D. Fernbach, London: Penguin, 1981) p. 264. Emphasis added.

[26] Mattick, *Economic crisis and crisis theory,*ch. 2.

[27] Mitchell, *What happens during business cycles: A progress report.*

[28] John Mills, "On credit cycles and the origin of commercial panics," *Transactions of the Manchester Statistical Society,* Session 1867-68 (1868): pp. 5-40.

for the time being."[29] Contrary to David Ricardo's view of capitalism leading toward a final stage of chronic stagnation, which would be the logical consequence of a long-run tendency of profitability to fall because of the need for using increasingly poor lands for cultivation, Marx saw a falling rate of profit triggering crises in which capital destruction and the increase in the rate of exploitation led to a recovery of the profit rate, and with it, a restart of the accumulation of capital. For Marx, permanent crises "do not exist."[30]

Versus Marx's view that capitalism is either in a status of expansion through quick capital accumulation, or in a temporary status of crisis or depression that occurs about once every ten years, it was Engels who developed the idea of long-drawn crises.

Engels seems to have arrived to the idea of long depressions after hesitation. In a letter to Bebel in May 1883 he apparently suggested that a five-year cycle was observable, as the

> ten-year recurring period has evolved distinctly only since 1847 (because of Californian and Australian gold production and, from this, the complete development of the world market). At present, when America, France, and Germany are beginning to break England's monopoly on the world market so that overproduction is beginning again—as before [18]47—but more swiftly being brought to bear, now the five year intermediate crises are also rising again […] The period of prosperity has not yet developed in full, and already after five years overproduction is setting in…[31]

Thus, in 1883, the year Marx died, Engels was claiming that crises were occurring at quinquennial intervals rather than decennially. Then three years later, in 1886, in the preface to the first English edition of *Capital,* Engels remarked that the decennial cycle "of stagnation, prosperity, over-production and crisis, ever recurrent from 1825 to 1867, seems indeed to have run its course; but only to land us in the slough of despond *of a permanent and chronic depression*".[32] Six years later, in the third volume of *Capital,* which Engels finished editing in 1894, he insisted, this time in a footnote, that

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[29] Marx, *Capita —A critique of political economy* (Vol. 3, ed. by Friedrich Engels [1894], transl. by D. Fernbach), ch 15, p. 357.

[30] Karl Marx, *Theories of surplus value* (Moscow: Progress, 1968), part II, p. 497.

[31] This letter is cited here according to the English translation provided in Thomas Kuczyinsky, "Marx and Engels on long waves," in *The long-wave debate*, ed. Tibor Vasko (Berlin: Springer-Verlag, 1987), pp. 35-45.

[32] Marx, *Capital—A critique of political economy* [1867] (Vol. I, transl. by B. Fowkes),, p. 113. Italics added.

> the acute form of the periodic process, with its former ten-year cycle, appears to have given way to a more chronic, long drawn-out alternation between a relatively short and slight business improvement and a relatively long indecisive depression.[33]

As in so many other things, Engels' interpretation became "the Marxist truth." The idea of long drawn-out depressions or crises has permeated Marxism and critical thought to the present day. It became common that Marxist authors referred to crisis or stagnation without much precision, but mostly meaning long periods of many years, even decades.

The suggestion of protracted cycles and longer periods of depression fits poorly even with the empirical data of the last decades of the 19th century when Engels proposed it. For instance, after a careful study of the evolution of a variety of economic indicators in England, France, Germany, and the United States, Wesley Mitchell concluded in 1913 that between 1890 and 1910 recurrent crises had interrupted European prosperity every few years, so that it could be said without grave inaccuracy that for England, France and Germany there had been

> crisis in 1889-90, depression until 1894, revival in 1894-1895 running up to a flood tide of prosperity in 1899, crisis in 1900, depression until 1903-04, revival followed by great prosperity culminating in 1906, crisis in 1907, depression in 1908, and revival once more in 1909.[34]

For Mitchell, these dates did not fit the United States economy where, for instance, there had occurred a panic in 1893 that was not accompanied by a crisis in Europe. Furthermore, the European crisis of 1900 was scarcely felt in America, where business continued to expand in the face of European depression until 1903-1904. At any rate, what Mitchell was showing is that one century ago major differences in the chronology of business cycles could be observed among countries.

Mitchell's work contributed to the establishment of the National Bureau of Economic Research, which has produced a chronology of business cycles in the United States since 1854. According to this chronology, 33 cycles with a mean duration of four to five years (56 months) have occurred. The NBER has identified 11 recessions of the U.S. economy since 1945, lasting on

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[33] Marx, *Capital—A critique of political economy* (Vol. 3, ed. by Friedrich Engels [1894], transl. by D. Fernbach), ch. 30, fn. 8, p. 620.

[34] Mitchell, *Business cycles*,p. 86.

average about one year (11 months) each, with intercalated expansions lasting on average five years (59 months) each. Note that these averages say nothing about a regular cycle, as the observed "cycles" vary widely in length. The NBER chronology includes six recessions of the U.S. economy since 1970, with starting dates in 1973, 1980, 1981, 1990, 2001 and 2007.

If crises, as Marx viewed them, are "violent eruptions" or momentary solutions of inner contradictions, in empirical terms it seems logical to make them equivalent to the recessions of the NBER, which being on average as short as a year, would qualify as temporary. Marx saw crises as periods in which the circuit of capital is interrupted, and because levels of profitability are insufficient, capital is frozen—and thus ceases to be capital—in the form of unsold commodities, unpaid debts, unused machinery, or hoarded money. This interruption of the process of accumulation of capital implies that a fraction of what was the total social capital before the crisis is either temporarily excluded from claiming a share in the produced surplus value or permanently eliminated as capital, at the same time that wage-workers lose their jobs, wages drop and conditions of work deteriorate.[35] The elimination of capital during crises is illustrated, for instance, by the financial assets reaching trillions that were wiped out in 2008.[36] A key component of the panic of 2008 was the demise of Lehman Brothers which had been valued at $635 billion. This was about ten times the value of Enron, and six times the size of WorldCom, both of which had melted down in the "mild" recession that had occurred seven years earlier.[37]

Since the average rate of profit that regulates accumulation is the ratio of surplus value produced to total capital in society, by raising the numerator through the greater exploitation of the labor force implied by falling wage rates and perhaps longer working days, and by reducing

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[35] Paul Mattick, *Marx and Keynes; the limits of the mixed economy* (Boston: P. Sargent, 1969); Clarke, *Marx's theory of crisis.*

[36] James Rickards, *Currency Wars: The Making of the Next Global Crisis* (New York: Penguin, 2012, p. 211) estimates in $6 trillion the financial assets destroyed worldwide by the 2008 crises. David McNally, *Global Slump* (Oakland, CA: PM Press, 2010, p. 13) gives an estimate of $35 trillion.

[37] Ibid, pp. 13 and 17.

the denominator by eliminating substantial fractions of the total capital available in society, the crisis poses the conditions for an increase of profitability and the start of a renewed accumulation of capital. Similarly, the subsequent period of capital accumulation, by increasing the organic composition of capital and creating conditions for business costs to increase, reducing profit margins, brings forth the conditions for another crisis. Both a permanent expansion in which the accumulation of capital occurs hitchlessly, and a permanent crisis in which capital does not accumulate, would represent an equilibrium state that is badly conceivable from the dynamic perspective that Marx develops in his work. Contrary to the views of Malthus, Keynes, Kalecky and the *Monthly Review* school, all of whom viewed capitalism as inherently prone to stagnation, Marx saw it as a system in which a ceaseless accumulation of capital is interrupted by temporary crises.

Authors in the Marxist tradition have nevertheless frequently understood crises as protracted phenomena, lasting many years and separated by decades. Thus, in recent years, authors writing from a left-wing point of view have often claimed that since the late 19th century there have been basically four crises, occurring respectively in the 1890s, the 1930s, the 1970s-1980s, and then the one that started in 2007. Representative of that view is, for instance, Leo Panich, who in 2013 claimed we had been

> living through a great capitalist crisis, really only the fourth crisis of such scale after the so-called Great Depression of 1873-96, the more familiar Great Depression of the 1930s, and the global stagflation and profitability crisis of the 1970s.[38]

This scheme of four crises (usually applied to the U.S. economy), is almost identically presented by Duncan Foley and Anwar Shaikh.[39] Shaikh, who differentiates among "general crises" involving a widespread collapse of the system and "partial crises and business cycles which are a regular feature of capitalist history," specifically states a length of 15 years for one of these crises

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[38] Leo Panitch, "Crisis of what?" *Journal of World-Systems Research* 19, no. 2 (2013): 129-135.

[39] Duncan Foley, "The Political Economy of Post-crisis Global Capitalism" [Paper prepared for the Economy and Society Conference at the University of Chicago, December 3-5, 2010]; Anwar Shaikh, "Economic crises," in *A dictionary of Marxist thought*, eds. Tom Bottomore, L. Harris, V. G. Kiernan and R. Miliband (Cambridge, MA: Harvard University Press, 1983), 138-143.; Anwar Shaikh, "The first Great Depression of the 21st century." *Socialist Register* 47 (2011).

that he refers to as "the Great Stagflation of 1967-1982."[40] The view that capitalism has gone through long-periods of stagnation is also maintained by Robert Brenner, who refers to a persistent stagnation of the U.S. economy lasting from 1973 to 1993.[41] Andrew Kliman claimed that the U.S. economy never fully recovered between what he calls "the slump/recession of the 1970s" and the start of the Great Recession in late 2007.[42] For Michael Roberts crisis conditions existed for 17 years in the U.S. economy in 1965-1982, and then for a similarly extended period since 1998 to the present.[43] Paul Mattick Jr. is perhaps the one who takes the idea of a permanent crisis to the furthest extreme; speaking in 2011 he claimed the "present crisis" was just the continuation of the crisis of the 1970s.[44] As David McNally has said,

> there is a markedly unhelpful tendency in many radical analyses to treat the entire forty year period since 1970 as a "crisis," a "long downturn" or even a "depression." Yet […] such assessments miss the mark by a country mile. They either ignore, or thoroughly downplay the dramatic social, technical, and spatial restructuring of capitalist production that occurred across the neoliberal period, all of which […] led to a volatile but nonetheless real process of sustained capitalist expansion, much of it centered in East Asia.[45]

For many reasons, David McNally's analysis of the Great Recession as a global slump can be considered a major contribution and a comprehensive investigation of the best quality. But even McNally, who brings clarity to many issues that are darkly obscure in the analyses of other authors, gets entangled in the simple issue of establishing a plain chronology of the developments that he describes. Thus, he says the world economy went through sustained expansion in 1948-1973, world slump in 1973-1982, and sustained expansion again in 1982-2007, and just a few pages later, he asserts that in the twelve years following 1969, "world

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[40] Ibid.

[41] Robert Brenner, *The boom and the bubble: the US in the world economy* (London: Verso, 2002).

[42] Andrew Kliman, *The failure of capitalist production: underlying causes of the Great Recession* (London: Pluto Press, 2012), pp. 11, 24, and 48.

[43] Michael Roberts, *The Great Recession: Profit Cycles, Economic crises—A Marxist View*, London 2009 (London: Author's Edition, 2009), p. 33.

[44] John Clegg and Aaron Benanav, "The economic crises in fact and fiction: Paul Mattick", *Brooklyn Rail* 2011, June, www.brooklynrail.org/2011/06/express/the-economic-crisis-in-fact-and-fictionpaul-mattick-with-john-clegg-and-aaron-benanav. In my view this shocking statement is particularly unfortunate because for instance in *Business as Usual: The Economic Crisis and the Failure of Capitalism* (London: Reaktion Books, 2011), Mattick has provided rigorous and enlightening analyses.

[45] McNally, *Global slump—The economics and politics of crisis and resistance*, p. 36.

capitalism would undergo two deep, demoralizing slumps."[46] So, how many slumps were there in the world economy in 1970-1982, one or two?[47]

The view that a crisis can last for many years or even decades fits with the concept of Kondratiev's long waves, which is often maintained by authors in the world-system perspective. Thus, Giovanni Arrighi once described the "Great Depression of 1873-1896," the "crisis of 1914-1945," and the crisis that started in the 1970s as the three moments "of a single historical process defined by the rise, full expansion, and demise of the U.S. system of capital accumulation on a world scale."[48] A more extreme view concerning the length of crises is that of Immanuel Wallerstein, who understands a crisis in the hyphenated world-economy not as a period of "conjunctural difficulties" but rather as a

> structural strain so great that the only possible outcome is the disappearance of the system as such either by a process of gradual disintegration (…) or by a process of relatively controlled transformation (…) a crisis is by definition a "transition," and "transitions" in large-scale systems tend to be (probably necessarily) medium-long in length, taking often 100-150 years.[49]

A world economy?

Among authors who favor the world-system theory, in which the world-economy is a key component, there are major differences in the dating of the birth of a global economic system or world-system. Some, such as Barry Gill and André Gunder Frank, go back as far as to see "the fundamental cyclical rhythms and secular trends of the world system having existed for some

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[46] McNally's *op. cit.*, pp. 26 and 31.

[47] Another author who has criticized the idea that the world economy was in a state of stagnation between the 1970s and the Great Recession is Rolando Astarita. Writing from an explicit Marxist point of view, Astarita cites IMF data showing that as a share of GDP, investment in 1986-1993 and 1994-2001 was respectively 18,8% y 19,6% in the United States and 31,4% y 32,4% in the Asian emerging economies. In per capita terms, the growth of the global output in 2003-2007 was greater than in the five years of highest growth of the 1960s—though world population grew in the 1960s at a faster rate than in the 2000s (Rolando Astarita, *El capitalismo roto*, Madrid: La Linterna Sorda, 2009, pp. 224-225).

[48] Giovanni Arrighi, *The long twentieth century: Money, power, and the origins of our times* (London: Verso, 1994), 400., p. ix.

[49] Immanuel Wallerstein, *Unthinking social science: The limits of nineteenth-century paradigms*, 2nd. ed. (Philadelphia: Temple University Press, 2001), p. 23.

5000 years."[50] Thomas Kuczynski saw the birth of a world capitalist economy in the 19th century, concretely in the depression that followed the 1825 crisis,[51] and Andrew Tylecote dated the first truly international boom in the 1850s.[52] Wallerstein, who sets the start of the world economy (henceforth I will suppress the hyphen) around the 16th to 17th centuries, is likely representative of general views; most authors in the world-system perspective would probably agree that a world economic system has had a real existence since as long a few centuries ago.[53] Against this view it could be argued that if world capitalism already existed in the late 19th century, it was in a relatively embryonic form that went through serious existential crisis for almost half a century of world wars and revolutions. Comparing Britain, France, Germany, and the U.S. in the periods 1879-1914 and 1919-1932, Oskar Morgenstern concluded that in the period before World War I, the international synchronization of business cycles was significantly greater than in the postwar period.[54] After World War II, the world system was constituted in such a way that a large portion of the world's land and population were quite neatly separated from the increasingly integrated Western capitalist markets. During the two decades of splendor and Pax Americana that followed World War II, world capitalism continued growing, and it is in this period that for instance Michael Spence situates the origins of the global economy.[55] But in the mid-1970s serious downturns were evident across Western economies, at the same time that different processes were bringing back toward world capitalism the third of the world's population that for several decades had been mostly separated from it in what was once called

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[50] Cited in Arrighi, *The long twentieth century: Money, power, and the origins of our times*, p. 8

[51] Thomas Kuczyinsky, "Kondratieff cycles - Appearence or reality?" in *Proceedings of the 7th International Economic History Congress*, Vol. II, ed. Michael Flinn (Edinburgh: Edinburgh University Press, 1978).

[52] Andrew Tylecote, *The long wave in the world economy: The present crisis in historical perspective* (London: Routledge, 1993), p. 207.

[53] Thomas R. Shannon, *An introduction to the world-system perspective* (Boulder, Colo.: Westview Press, 1989), pp. 21, 43, 136, etc.

[54] Oskar Morgenstern, *International financial transactions and business cycles* (Princeton: Princeton University Press, 1959), ch. II.

[55] Michael Spence, *The next convergence: The future of economic growth in a multispeed world* (New York: Farrar, Straus and Giroux, 2011), ch. 4.

"the socialist camp." In the 1920s and 1930s the USSR made successful efforts to be involved in trade with capitalist countries, and between the 1950s and the 1980s the economies of the Soviet bloc developed important links with Western economies through borrowing and trade. But it was only when economic reforms started in China in the 1980s, and then the centrally planned economies of Eastern Europe and the USSR imploded, that this considerable fraction of the economy of the world became an integral part of the world economy in the sense of world capitalism. Before 1990, the Soviet bloc countries traded with the Western capitalist world, but basically their economies were isolated from it. In the case of China, the isolation from the world market during the Maoist period was even greater, but this changed progressively since the late 1970s. Then, in just one decade China became fully integrated into the world market, to become in the 1990s a world leader in exports.

The construct that we call world or global economy or, perhaps better, world capitalism is similar to constructs such as "European colonialism" or "Middle-East empires," and may or may not have validity depending on the historical period considered. It seems obvious that the world economy as a construct has gained credibility and validity with the pass of time. Medieval theologians argued over when in the gestation period the human fetus is infused with a soul, thereby becoming human, and similar endless arguments would be possible about a concrete birthdate when the capitalist economies of major nations became sufficiently entangled to constitute a global capitalism. Three decades ago, in spite of the existence of the USSR, the many countries in the Soviet sphere, and an autarkic Chinese economy in which the market had very little or no role, Wallerstein claimed that "there are today no socialist systems in the world-economy any more than there are feudal systems because there is only one world system. It is a world-economy and it is by definition capitalist in form."[56] Many found difficult to agree with that statement, but after the demise of the USSR and the centrally planned economies of Eastern

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[56] Immanuel Wallerstein, *The Politics of the World-Economy: The States, the Movements and the Civilizations,* (Cambridge, Cambridge University Press, 1984), p. 35.

Europe, and the accelerated integration of China and the rest of the "socialist camp" in the world market, the concept of the world economy as a unique entity is undeniable.

To make the case that the Great Recession of 2007-2009 was a world economic crisis is an easy task when, for instance, major reversals to GDP growth were registered in 2008 and 2009 in almost all countries of the world. The annual rate of economic growth dropped in China from 14.2% in 2007 to 9.6% in 2008 and 9.2% in 2009; in Brazil, the pre-crisis GDP growth, 6.1% in 2007, was reduced to 5.2% in 2008 and –0.3% in 2009; Germany's GDP grew 1.1% in 2008 and contracted 5.1% in 2009. As estimated by the World Bank, the output of the world economy, WGDP, grew by 4.0% in 2007 and by 1.4% in 2008, shrank 2.1% in 2009, and grew again by 4.0% in 2010. WGDP figures provided by the World Bank are subject the same criticisms that are leveled against GDP as a national economic indicator, but those criticisms are basically addressed to the Samuelsonian view that GDP per capita represents some kind of psychic income and is therefore a good measure of human well-being.[57] But national GDP figures do provide a rough index of the intensity of economic activity, which has unarguable economic meaning as it correlates strongly with other more "tangible" economic figures; and of course, the same is true of WGDP.

Furthermore, leaving aside GDP figures, it is indisputable that in any explanation of the issues leading to the financial crisis of 2008 and its aftermath, major roles are played by factors such as the dissemination of mortgage-based U.S. securities to international markets, the cross-national ownership of national debts, the international role of old and new currencies (the dollar and the euro), the massive displacement of manufacturing from the "industrialized countries" toward China and other "emerging" economies in the past two decades, and the emergence of a global elite. With Chinese factories assembling "German" Volkswagens, "American" Chevrolets, and "Japanese" Hondas, and the Ford company pulling together its Escort models in Germany

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[57] See for instance the essays by Gustavo Esteva on "Development", by Jean Robert on "Production" and by Serge Latouche on "Standard of Living" in Wolfgang Sachs ed., *The development dictionary: A guide to knowledge as power* (London: Zed Books, 1992).

from parts produced in 15 countries, it is hard to argue that the relevant object of social and economic relevance to be analyzed is not a world-system of which national economies are just components. In 1929, at the peak of world trade before the large contraction of international commerce during the 1930s, U. S. exports and imports amounted to some 6% of U.S. GDP, while in the early 2000s exports were 10% of GDP and imports were about 15% (the gap reveals the outstanding debility of the U.S. economy as an exporter). An even more significant illustration of the present interpenetration of national economies would be the corresponding figures for both imports and exports compared with GDP which in the early 2000s were 40% for Canada, 70% for the Czech Republic, 90% for Estonia, and 120% for Malaysia. The cheapening of transport and communication costs since the 1930s has been staggering. Ocean-freight and port charges have been cut by more than half, air transportation by four fifths, and international telephone calls by more than 99%.[58]

That the world has largely become a unique global economic space is increasingly recognized in economic and financial news. In September 2013 it was reported that in an attempt to maintain the perspectives of recovery, the European Central Bank promised to keep its benchmark interest rate at a record low indefinitely. “The world has become more interdependent,” was the reaction of Norbert Reithofer, chief executive of the German automaker BMW. “When Ben Bernanke makes a statement, it has an effect on the Indian rupee, it has an effect on the Turkish lira, it has an effect on the South African rand.”[59]

The G20 has consolidated in the wake of the crisis, and its sequence of meetings in the past five years has been considered “the closest thing the world had ever seen to a global board of directors.” The International Monetary Fund had languished in the early 2000s but the G20 “breathed new life into the IMF by positioning it as a kind of Bank of the G20 or proto-world

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[58] Beth V. Yarbrough and Robert M. Yarbrough, *The world economy: International trade,* 7th ed. (Mason, Ohio: Thompson South-Western, 2006), pp. 6-10

[59] B. Appelbaum, "In surprise, Fed decides to maintain pace of stimulus," *New York Times,* September 18, 2013 2013, p. A1-B5.

central bank."[60] Characteristically, Michael Spence has claimed that the G20 should be such a world-level institution of governance, required by the existence of the global economy.[61]

Nature, oil and the five crises

The evidence shows conclusively that the five crises of the world economy proposed here are the only periods in the past half-century in which the exponential growth in emissions of CO_2 has slowed down (figures 6 and 7). In spite of uncertainties (as, for instance, those stemming from the fact that global temperatures seem to be increasing at a lower rate than expected in recent years), the scientific consensus seems to be that greenhouse gas (GHG) emissions are pushing the earth's climate toward severe disturbance because of global warming. The usual panacea of economic policy is greater economic growth, but in this case it happens that the greater the dose of that panacea, the faster the progress of human civilization toward climate disaster. In the holistic *oikeios* of Jason Moore, that represents a major linkage between ecological crisis and the dynamics of the capitalist economy.[62]

There is also another aspect in which the *oikeios* is highlighted. The global slump of the mid-1970s has often been called the Oil Crisis, and indeed a peak in the world price of oil occurred in 1974 (figure 8). But there were also peaks of oil prices in 1980, 1990, 2000, and 2008, which means that oil prices were rising *in the period immediately previous to each of the five crises*. Mainstream economics usually blames economic crises on something foreign or contingent to the system, such as governments tinkering with the money supply (in the right-wing version) or

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[60] Rickards, *Currency Wars: The Making of the Next Global Crisis* (pp. 127-133), David J. Rothkopf, *Superclass: the global power elite and the world they are making* (New York: Farrar, Straus and Giroux, 2008), and Spence, *The next convergence: the future of economic growth in a multispeed world*, provide wide evidence on these developments.

[61] Ibid. In my opinion, the increasingly frequent use of the word "governance" as opposed to "government" for such institutions as the G20 or the executive offices of the European Union expresses the ambivalence of the national elites who are increasingly conscious of moving toward supranational government institutions but at the same time are strongly attached to the nationalism that has been the most effective tool to maintain their power, and they are highly suspicious of ideas of world government which are usually linked to communism or revolution.

[62] Jason W. Moore, "Ecology, capital, and the nature of our times: Accumulation and crisis in the capitalist world-ecology," *Journal of World-Systems Research* 17, no. 1 (2011): 107-146.

lack of regulations to prevent speculation (in the left-wing version). In the context of the obscure real-business-cycle theory of neoclassical economics, unnamed "productivity shocks" are often blamed as determinants of crisis. The econometrician James Hamilton reported a statistically significant correlation between oil price shocks and economic recessions in postwar U.S. data. Considering that these oil shocks could convincingly be traced to specific exogenous historical events, Hamilton's conclusion was that the evidence "makes it difficult to reject the historical correlation as entirely spurious," meaning that oil price increases (caused by sheiks' manipulations and the like) might be the shocks that push the economy to recession.[63]

The evidence indicating a correlation between oil price shocks and the last five crises of the world economy (figure 8) is solid. Political explanations seem unlikely, but other factors may account for the phenomenon. Indeed, as explained by Wesley Mitchell a century ago, in each period of expansion of capitalism there is a strong increase in the demand for raw materials and energy, raising their prices, which then cease rising and drop as soon as the economy stutters, so that demand falls. [64] Before Mitchell, it was Marx who posed increases of prices of raw materials as an immediate cause of reductions in the rate of profit, and periods of accumulation as occasions in which the supply of raw materials is often insufficient to meet the rising demand. For Marx, the more capitalist production is developed, and the more rapid is the process of accumulation in times of prosperity, the greater is the relative overproduction of machinery and other elements of fixed capital, and the more frequent is the relative under-production of raw materials, with the consequent rise of their prices. Marx referred this mostly to raw materials of vegetal or animal origin, because they were subject to the influence of climate or long periods of production, but the idea is clearly applicable in recent decades to oil, which being the major

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[63] James D. Hamilton, "A neoclassical model of unemployment and the business cycle," *Journal of Political Economy* 96, no. 3 (1988): 593. See also the interview with Hamilton in Randall E. Parker ed., *The Economics of the Great Depression: A 21st Century Look Back at the Economics of the Interwar Era* (Cheltenham, UK: Edward Elgar, 2007), pp. 80-81.

[64] Mitchell, *Business cycles.*

source of energy becomes increasingly demanded and expensive in each global expansion. [65] Whether or not we are at present in a scenario of peak oil, the peaks of oil price preceding the five crises of the world economy argue much in favor of a mechanism in which crises are triggered by, among other things, increasing prices of raw materials.

Historically, the transitions from peat and charcoal to coal, and from coal to oil, were major technological revolutions that initiated periods of accelerated accumulation in the history of global capitalism, since cheap energy "powerfully checks the falling rate of profit."[66] Conversely, expensive oil reduces profitability and pushes toward crisis, as clearly illustrated by what happened in the early 1970s, late 1980s, late 1990s, and in the years immediately before the Great Recession.

Economics and the empirical reality of crises

Keynes and Kalecki saw a tendency of the capitalist economy to stagnate if not stirred by government stimulus and interventions. In the United States this view was supported by Baran, Sweezy, Galbraith, and many others, and has permeated most economic thought on the left since the 1940s. At the same time, there were two main developments in mainstream economics. On the one hand, under the lead of Paul Samuelson and others who considered themselves Keynesians, the so-called neoclassical synthesis stated that Keynesian theory had made it possible to fully control the economy, making the alternations of prosperity and depression a thing of the past. On the other hand, the rise of conservative economic thought under Milton Friedman's monetarism touted the virtues of the spectacular growth of U.S. capitalism and claimed that business cycles could indeed be avoided if the market were left alone and the government did not interfere with the economy. Though disagreeing about the means,

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[65] Marx, *Capital - A critique of political economy* (Vol. 3, ch. 6, particularly p. 214). There is a translation error: it says overproduction of plant and animal raw materials when it should say underproduction.

[66] Moore, *Ecology, capital, and the nature of our times: Accumulation and crisis in the capitalist world-ecology*, 107-146.

Keynesians and monetarist anti-Keynesians agreed that it was possible to avoid economic disturbances.

In just two decades and under the intellectual pressure of the stagflation of the 1970s, the Keynesian hegemony in economics was severely undercut. New Keynesian and New Classical theories of the business cycle appeared, attributing economic recessions to phenomena external to the economy—not to the endogenous tendency to stagnation of capitalism and the volatility of businessmen's animal spirits that Keynes had proposed. In the years before the great collapse of 2008, there were many in the economic profession who denying the obvious links between North American and Western European capitalism and the rest of the world, ignored the crises that were occurring overseas and proposed such theories as "the New Economy" and "the Great Moderation," according to which in recent decades there had been a moderation of business cycles in the developed world as a consequence of intelligent economic policies.[67]

That most of what has been done in macroeconomics in the past thirty years is at best irrelevant and at worst harmful is a view obviously not shared by many macroeconomists. That such an opinion had been proposed by a renowned economist,[68] however, is a sign of how deeply injured is the intellectual health of standard economics.

For those who want to use theory to understand the world in which we live (which includes the purpose of transforming it into a more sustainable and just reality for future generations) it is more important than ever to pay attention to the economic reality and to the consistency of

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[67] The notions of the New Economy and the Great Moderation were developed in the 1980s and 1990s, when mainstream economists asserted that in the post-war period macroeconomic aggregates of the U.S. economy presented less volatility, recessions had become shorter and expansions longer (Francis X. Diebold and Glenn D. Rudebusch, *Business cycles: Durations, dynamics, and forecasting (*Princeton, N.J.: Princeton University Press, 1999)). In a strict sense, though, the concepts of the New Economy and the Great Moderation made their proper appearance after the turn of the century (see for instance Olivier Blanchard, *Macroeconomics*, 4th ed. (Upper Saddle River, N.J.: Pearson Prentice Hall, 2006), p. 36.; Robert J. Gordon, *Macroeconomics*, 11th ed. (Boston: Addison-Wesley, 2009); Todd A. Knoop, *Recessions and depressions: Understanding business cycles* (Westport, Conn.: Praeger, 2004); "Remarks on The Great Moderation by Governor Ben S. Bernanke at the meetings of the Eastern Economic Association, Washington, DC, February 20, 2004" (www.federalreserve.gov/BOARDDOCS/SPEECHES/2004/20040220/default.htm). They had a short life as they were killed by the debacle of 2008.

[68] Anonymous, "Paul Krugman's London lectures: Dismal science—The Nobel laureate speaks on the crisis in the economy and in economics," *The Economist* (2009).

theories with facts. But, of course, it is true that—as Einstein said— theory guides empirical work and researchers look at the variables the theory tells them to look at. After decades of macroeconomic theory denying the dependence of finance and credit from on the real economy, the world convulsion that erupted in 2008 was basically attributed to events in the financial sphere, and authors trying to look for antecedents of crisis looked for instance at "eight centuries of financial folly," [69] or at one hundred and fifty years of currency wars and its antecedents,[70] rather than a few centuries of development of global capitalism in which business cycles have been a major characteristic.

In analyzing "the history of various types of financial crises," *This Time is Different* by Reinhardt and Rogoff raises "many important questions (and provides considerably fewer answers)" (p. 283). Among the few answers that Reinhardt and Rogoff provide is the more than dubious concept of "graduation," which basically means that there is some kind of specific threshold that countries can overcome, so that they graduate from "emerging" to "advanced economy" status and are no longer exposed to default of sovereign debt. As Reinhardt and Rogoff put it,

> Graduation can be defined as the attainment and subsequent maintenance of international investment-grade, the emphasis here is on the maintenance part. Another way of describing this criterion for graduation would be to say that the country has significantly and credibly reduced its chances of defaulting on its sovereign debt obligations.

That Reinhart and Rogoff mentioned France and Spain as examples of graduation (p. 283) is illustrative of how events can make statements obsolete in just a couple of years. *This Time is Different* was published in 2009, at a time when economists looking for the root of crisis in the unbalances and particular markets such as housing or finance asserted with confidence that for instance in Spain there had not been any banking crisis.[71]

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[69] Reinhart and Rogoff, *This time is different: Eight centuries of financial folly*.

[70] Rickards, *Currency Wars: The Making of the Next Global Crisis.*

[71] Dean Baker, "Blame it on the bubble," *The Guardian*, March 8 2010.

The stylized facts pertaining to a phenomenon have been defined as "the enduring empirical regularities that are its defining characteristics."[72] Many of the stylized facts of business cycles are found in the five crises of the world economy since 1970. As has been shown here, since the 1970s, the rate of growth of the world economy has been positive over the long term. During this period have been recurrent but not periodic cycles, with five expansions of investment in fixed capital coinciding procyclically with expansions of economic activity, as measured in inflation-adjusted money terms and in terms of a "chemical index"—CO_2 emissions—that provides a clear proxy for global industrial activity. For Zarnowitz, one of the stylized facts of business cycles is that "monetary aggregates usually experience only reduced growth rates, not absolute declines, in connection with ordinary recessions," so that only "in cycles with severe contractions do substantial downward movements interrupt the pronounced upward trends in these series."[73] This fits perfectly with the "severe contraction" of 2008-2009, and the four previous "ordinary recessions" of the world economy around the turn of the century, early 1990s, early 1980s, and mid 1970s. According to Zarnowitz, during the 1950s and 1960s, cyclical downturns in the Western world

> assumed the form of retardations of growth rather than absolute declines. However, these slowdowns and the intervening speedup phases continued to show a high degree of international diffusion. Then growth slackened and the "classical" business cycles (with absolute declines in total output and employment) reappeared everywhere in the 1970s. The tendency for these cycles to be roughly synchronized across the major trading countries became visible again…

This tendency towards synchronization of international cycles has been long considered a non-controversial stylized fact of business cycles.[74] Statistical analyses of 1970-1993 series of output, investment, and consumption in the G7 countries revealed a "world business cycle" with downturns in the mid-1970s, early 1980s, and early 1990s. The series had important national components, but they also revealed major common components, particularly in output and

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[72] M. H. I. Dore, "Stylized Facts," in *Business cycles and depressions: An encyclopedia*, eds. David Glasner and Thomas F. Cooley (New York: Garland, 1997), 662-664.

[73] Victor Zarnowitz, "Recent Work on Business Cycles in Historical Perspective: A Review of Theories and Evidence," *Journal of Economic Literature* 23, no. 2 (1985): 523-580.

[74] Dore, *Stylized Facts,* 662-664.

investment, so that "if the business cycle is indeed a worldwide phenomenon, then it may not be as responsive to domestic policies or influenced by domestic causes as previously thought."[75] The occurrence of clearly synchronized downturns of the major national economies around the turn of the century and in 2007-2009 appears to be strongly consistent with the idea that, across countries, cycles are not only synchronized, but actually integrated parts of the same phenomenon. The crises, cycles, and fluctuations pertain to the world economy. As put by Robert Brenner ten years ago, "the oft-heard notion that the U.S. economy is essentially self-contained and can be analyzed as such is profoundly misleading."[76]

In spite of many regressions with thousands of data points, the tradition of empirical research on business cycles has been largely repudiated by modern economics. Macroeconomists trying to explain business cycles start from major assumptions such as general equilibrium and then try to calibrate their models. Thus, "theory" is used to guide the analysis of empirical data in a way that makes it impossible to falsify any major element of theoretical preconceptions about "rationality of agents" and "general equilibrium" of markets. Original research on business cycles by Wesley Mitchell, Jan Tinbergen, and others is rarely mentioned. The "atheoretical" character of Mitchell's research was utilized as a weapon against his views by Samuelsonians and monetarists, and even many years after his death in 1949, Wesley Mitchell was still under attack by conservatives. In 1959, Murray Rothbard commented on a reprint of a book by Mitchel, stating that Ludwig von Mises had located the cause of business cycles in interference with the free market, "while all other writers, following Mitchell, cherish the idea that business cycles come from deep within the capitalist system, that they are, in short, a sickness of the free market. The founder of this idea, by the way, was not Wesley Mitchell, but Karl Marx."[77]

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[75] Allan W. Gregory, Allen C. Head, and Jacques Raynauld, "Measuring World Business Cycles," *International Economic Review* 38, no. 3 (1997): 677-701.

[76] Brenner, *The boom and the bubble: the US in the world economy*,.

[77] "Why the Business Cycle Happens" [1959]. Available from mises.org/daily/1558.

Mitchell would probably have felt insulted by such a comment. Whereas Marx was a revolutionary, Mitchell was a prudent defender of reforms and throughout his life worked to produce an economic theory that could be implemented to subvert the persistent boom and bust cycle of business activity that was causing so much pain to individuals and communities. It might be that after a lifetime of studying business cycles, he saw no way of avoiding them. If that was the case, he was arriving at conclusions that standard economic theory has shied away from. He was 70 years old when posed the question in *The New York Times* of how a "system of free enterprise " could operate "without falling every few years into a spasm of unemployment." His only answer was that for that problem "no nation has yet found a solution that does not involve the suppression of free enterprise itself."[78]

The great convulsion of the world economy that erupted five years ago pushed the economics profession a long way toward questioning its views on some issues, though not shaking its "principles." A good example of this is the work of Nobel Prize-winning microeconomist Michael Spence, who chaired the Commission on Growth and Development sponsored by several governments and the World Bank. Formed by 22 business leaders, politicians, and economists, the Commission produced several reports before its work formally ended in 2010. In 2011, Spence published *The Next Convergence,* which can be considered a summary of the reflections and conclusions of the Commission.[79] Spence's book illustrates how the world economic and business establishment is today much more guarded in its defense of "basic economic principles" such as free markets, business self-regulation, and fiscal soundness; much emphasis is put on the idea that different countries may require different solutions in terms of economic policy. One of the most interesting aspects of *The New Convergence* is the full acknowledgement of a global economy that for Spence was born with the formation of GATT after World War II. For Spence, as previously noted, this global economy requires not only

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[78] Wesley C. Mitchell, "Depression-proof economy is sought: Test of free enterprise," *New York Times,* September 18 1944, p. 22.

[79] Spence, *The next convergence: the future of economic growth in a multispeed world.*

world-level analyses but also world-level instruments of governance. Spence considers the G7/G8 to be insufficient for the task, and he believes the G20 should be that instrument.

As part of his discussion of the global economy and global issues, Spence mentions climate change, an issue usually ignored by economists dealing with problems of development and growth. Spence's views on climate change—like those of the economic profession at large—make little sense, as he thinks with not much evidence to support it that a combination of markets for trading of emission permits, combined with a carbon tax for some particular economic activities, can sufficiently reduce emissions and avoid environmental disaster without interfering with the growth of the world economy. Unfortunately, that view does not look feasible, given that the growth of the world economy and further worsening of global warming seem to be largely interconnected things (see figures 6 and 7).

It can be argued that the acknowledgment of a global economy may contribute to some change in general views of opinion leaders. This is illustrated by Spence's discussion on the ideas of nationalism, social cohesion, and identity that unify countries or continents, where he asserts that some modification

> of the notion of "us" that goes beyond national borders is probably going to be needed—a sense of a fully collective commonality of interest. Nationalism, which sometimes facilitates farsighted collective choice within the country, can get in the way when it comes to global cooperation (p. 35).

Whoever says it, it is good to hear that nationalism can be an obstacle for cooperation. In the 20th century nationalism was a basic support for policies leading to war and oppression of minorities (and sometimes majorities). It is time for humanity to put nationalism in the garbage bin, if we want to end the 21st century without a third world war or a major environmental disaster.

Long waves?

In mainstream economics, probably Joseph Schumpeter was the only important author who supported the idea of long economic cycles or Kondratiev waves (K-waves). Schumpeter not

only believed in the existence of K-waves of about 50 years duration; in his scheme there were also intermediate Juglar cycles nine or ten years long and short Kitchin cycles of about 40 months. For Schumpeter, each Kondratieff should contain an integral number of Juglars and each Juglar an integral number of Kitchins.[80]

Frequently authors who support the world-system perspective also support the hypothesis of long economic cycles (K-waves). K-waves would last 50 to 60 years and would be divided into an A-phase of overall expansion and a B-phase of stagnation, each 25 to 30 years in length.[81] For Anwar Shaikh, to cite a known supporter of the theory, business cycles would be "the most visible elements" in the development of the capitalist economy, but underlying them there are K-waves which provide "a much slower rhythm consisting of alternating long phases of accelerating and decelerating accumulation."[82]

These schemes have the serious problem that empirical research shows the alternate succession of expansion and recession in a "cycle" which has as perhaps its main characteristic that it is of varying length.[83] In the context of boom-and-bust cycles of varying length, K-waves have had little support in academia, and among authors who support the K-wave hypothesis there are major differences in the dating, measurement, and explanation of these half-century cycles.[84] Authors who have looked for the statistical evidence in favor of the K-wave hypothesis have often not found it.[85] And with good reason: if waves 50 or 60 years long exist, statistical evidence conclusively supporting their existence would require a period of observation of more

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[80] A Marxist version of Schumpeter scheme of waves can be seen in Roberts, *The Great Recession: Profit Cycles, Economic crises - A Marxist View* (London 2009), p. 70.

[81] Wallerstein, *Modern World-System III: The Second Era of Great Expansion of the Capitalist World-Economy, 1730s-1840s,*, pp. xvii-xviii.

[82] Shaikh, *Economic crises*, 138-143.

[83] Mitchell, *What happens during business cycles: A progress report.*

[84] Shannon, *An introduction to the world-system perspective*, 208., p. 176. Compare for instance Immanuel Wallerstein, *After liberalism* (New York: New Press, 1995), p. 15, with W. W. Rostow, *The world economy: History & prospect* (Austin: University of Texas Press, 1978), p. 298.

[85] Thomas Kuczyinsky thoroughly examined the evidence in favor of the existence of K-waves. He concluded that the evidence, if any, was flimsy. Kuczyinsky, *Kondratieff cycles - Appearence or reality?*

than a few centuries. But for most supporters of the world-system view, the world economy is only a few centuries old. If that is the case, K-waves are a kind of Russell's teapot, an entity whose existence cannot be disproved. Leaving those considerations aside, the present writer is with the majority view in the scientific community that the empirical evidence in favor of K-waves is no more convincing than the statistics W. S. Jevons once provided to demonstrate that business cycles are linked to sunspots.[86] Furthermore, assuming K-waves exist, an additional consideration is that their half-a-century periodicity would give them a kind of magical character. Like a wonder violin that always produces the same pitch wherever the fiddler puts her finger along the length of the vibrating string, the world economy would "vibrate" at the same frequency in spite of major changes to the vibrating structure.[87]

Authors in the world-system perspective have proposed the late 1960s as the starting point of a K-wave phase B that would have followed an A-phase starting in 1945.[88] Considering the proportion of investment in total global output (figure 2), which oscillated around 25% in the mid-1970s and dropped down to 19% in the Great Recession, a long-term decline seems to be apparent. On the other hand, as estimated by the World Bank, the volume of money in the global economy (compared with the global output, figure 5) has oscillated over a steadily increasing trend from levels between 55% and 60% of WGDP in the late 1960s to levels between 120% and 130% in the years around the Great Depression. Without much effort and without any need to appeal to K-waves, these trends can be interpreted as substantive evidence in favor of a long-term decrease in the rate of accumulation of capital and a long-term increase of the weight of the financial sphere in the global economy during the past four decades. However, assuming

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[86] Morgan, *The history of econometric ideas*.

[87] Perhaps significant of an incipient change in the world-system perspective on K-waves is Giovanni Arrighi's recommendation that world-system analysis abandon the idea "of a quantitatively expanding but structurally invariant world capitalist system" which would have Kondratieff cycles as one of the empirical manifestations of such a structural invariance. For Arrighi, "globalization of historical capitalism must instead be represented as involving fundamental structural transformations of the spatial networks in which the system of accumulation has been embedded." (Giovanni Arrighi, "Spatial and other "fixes" of historical capitalism," *Journal of World-Systems Research* 10, no. 2 (2003): 527-539.).

[88] See for instance Shannon, *An introduction to the world-system perspective*, 208., p. 116 and Wallerstein, *After liberalism*, p. 15.

that K-waves exist and a B-phase of stagnation started in the late 1960s, from the early 1990s to the late 2010s the world economy should have been in an A-phase with flourishing growth of world capitalism. That case seems rather incompatible with the Great Recession of 2007-2009 and the very weak recovery of the various integrated parts of the world economy since that enormous downturn began five years ago.

Final remarks

In the fall of 2013 some evidence indicates that European economies might be starting to expand after several years of contraction. The rates of growth of many "emerging" economies have been declining for several quarters, however, and in spite of being flooded with massive injections of liquidity by successive batches of quantitative easing, the U.S. economy has gone through a very weak recovery since 2009, with low rates of job creation because of the lack of investment. Since 2007, real wages have gone down in the United States and many other countries, which has improved rates of return to capital, creating better prospects for investment, which, nevertheless, continues at levels much below what is needed for quick reductions of unemployment rates. To a limited extent since 2007, bankruptcies have reduced the mass of capital. But so far, the improvement in the expectations of profitability does not seem to be sufficient to raise the world economy to a new full-blown expansion, as huge masses of capital, including enormous volumes of debt, are still claiming their share in the world output of profit. A new fact of the times appears to be the reluctance of the global elite who effectively controls major central banks to allow the major liquidations of capital that would allow for a quick recovery of profitability. In spite of gangrene, the patient is conscious and does not want any amputation, perhaps because he sees the potential loss as too large? What is at risk may be his life, but financial and non-financial multinational corporations, private and sovereign funds, and all others forms of capital are his arms and his legs—and no one wants to be cut.

The world rate of profit, which depends on the total mass of profit available and the total volume of global capital among which the profit has to be distributed, seems to be still too low to trigger a strong round of investment spending. But this might change soon. At the world level, economic conditions in the fall of 2013 can be viewed essentially as corporations and the wealthy elites sitting on mountains of cash that they don't know how to invest profitably. If opportunities for investment appear, a full recovery might occur in the next few years; if present conditions of uncertainty continue for some quarters, it seems unlikely that the U.S. economy can avoid going down with Europe and the rest of the world. In which case, we would be at the start of the sixth crisis of the global economy since the 1970s.

APPENDIX 1: MONEY LEADS

Using data downloaded in July 2013 from the WDI database of the World Bank, for the years 1961-2011 (n = 51) the correlation between the rate of growth of m = M2/WGDP and the rate of growth of WGDP is −0.26, which is marginally significant (P = 0.065). But the correlation of the rate of growth of m lagged one year with the rate of growth of WGDP is 0.35, which is statistically significant (P = 0.013). Estimating a "monetarist model" in which the growth of WGDP (g_t) is a function of the contemporaneous and one-year lagged growth of M2/WGDP ($g_{m,t}$ and $g_{m,t-1}$), the estimated equation (standard errors in bracket below the parameter estimates) is:

$$g_t = 3.40 - 0.086\, g_{m,t} + 0.122\, g_{m,t-1}$$
$$(0.26)\ \ (0.051) \qquad (0.051).$$

The R^2 is 0.18, and the Durbin-Watson d is 0.89, so that the model predicts less than a fifth of the variation of g_t and the d well below 2 indicates positive autocorrelation of the residuals (adding an extra lag or suppressing the lag-zero term does not improve the fit of the model) . Overall, both this regression model and the lagged and contemporaneous correlations of the growth of m with the growth of WGDP can be considered as providing evidence that "money leads" the fluctuations of the economy. This is a known fact that was highly emphasized by Milton Friedman, though of course it can be explained in different ways. For instance, Tobin emphasized a Keynesian dynamics in which autonomous changes in investment are the cause of cyclical fluctuations of output, and the corresponding movements of money

precede the movements of output without causing them.[89] Similarly, from a perspective in which investment *is not autonomous* but depends on profitability, investment spending continues growing during the late phase of an expansion, but the growth of profits slows down, stagnates and finally reverses, which *ceteris paribus* will tend to reduce the growth of M2. Thus, the slowdown and subsequent reversal in the rate of growth of M2 will precede the decline in investment and total output that marks the start of the downturn. Similarly, during the late phases of the recession, the level of profitability starts to increase though investment spending is still stagnant, which will lead to an increase in the rate of growth of M2, announcing the recovery. In this perspective, as in the Keynesian perspective of Tobin, money leads, but to attribute causality to that relationship is a *post hoc ergo propter hoc* fallacy.

APPENDIX 2: ON THE ACURACY OF ECONOMIC OBSERVATIONS

The first version of this paper contained a figure (figure A1 here) in which the volume of money in the world economy was plotted as $m = 100 \times M2/WGDP$. The data plotted in that figure were downloaded from the WDI database in July 2012. In the former version of the paper I commented on the explosive growth of m in 2007 and 2008 and said that the series provided a good illustration of Mandelbrot's idea that the representation of economic time series as a trend on which Gaussian deviations are superimposed is frequently invalid.[90] One of the reviewers who read the paper had reservations on the data presented in the figure and requested reference in detail of the sources I had used. For that reason I checked the data, downloaded them again from the WDI website, and compared them with the data I had used for the figure. I was surprised when I noticed the data had been dramatically changed for the years 2007 and 2008 (compare figures 5 and A1). Table A1 presents the two series of data. They are basically identical except for the years 2007 and 2008, in which they differ respectively by several orders of magnitude. On July 31, 2013, I sent an email to the World Bank to inquire about this startling change in the reported statistics. On August 6, I received a reply: "Our WDI database is updated quarterly, and data frequently changes as new information comes in and revisions are made. This is a normal occurrence across all indicators. Which countries are you referring to specifically?" The same day, I emailed back: "Dear data

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[89] James Tobin, "Money and Income: Post Hoc Ergo Propter Hoc?" *Quarterly Journal of Economics* 84, no. 2 (1970): 301-317.

[90] Benoit B. Mandelbrot and Richard L. Hudson, *The (mis)behavior of markets: a fractal view of risk, ruin, and reward* (New York: Basic Books, 2009).

managers of the World Bank: Thanks for your answer. I am referring to the data for the world economy as presented in your database, World Development Indicators. World M2 as compared to world GDP, as downloaded from your database in July 2013 [...] is 113.22% for year 2007, while according to the same database but with data that I downloaded a few months before, in November 2012 [...], the same figure was 1114.98%. The difference is one order of magnitude. However, for the next year, 2008, the difference is not one but several orders of magnitude, since M2 for 2008 was estimated in your database (in November 2012) as 3.6 billion times bigger than world GDP. It seems to me that because of the financial crisis somebody in your statistics department estimated in terribly different ways the monetary aggregates in these years. I guess since your world data must be just aggregates of national data, the big M2 for the world must be caused by big M2 for the most important economies, but that is just my speculation, I would like to know your explanation." Since I did not receive any reply to this message, on September 13 I sent an email asking if they were going to answer my question or if the issue had been archived. I received a short reply telling me one of the data support specialists would reply as soon as possible and in the meantime, I could visit datahelpdesk.worldbank.org "to review information that may be of help." To date, late November 2013, I have not received any other answer and I have stopped pursuing the issue.

The initial huge estimates of M2 in the years around the financial crisis of 2008 may be a consequence of the changes in the balance sheet of central banks which had enormous increases in assets consisting of devalued securities purchased from financial institutions that in exchange got liquid accounts. Furthermore, in 2007 and 2008, because of derivative contracts a number of banks and financial firms received compensation in the form of deposits for payments not received. The combined effect of these and perhaps other processes may have generated a massive expansion of the monetary base, one of the components of M2. Since many of these financial operations were either never completed or later declared void because of bankruptcies or nationalizations (as in the case of AIG), major adjustments may have been made in the estimates of M2 for these years. At any rate, whatever the reasons that the World Bank does not appear to be willing to provide an explanation, what this story illustrates is that, as Oskar Morgenstern emphasized half a century ago, economic statistics "are—in the overwhelming majority of

cases—not *scientific observations.*"[91] They have to be used with special care[92] and that is probably mostly applicable to such difficult-to-observe quantities as "the money stock."

[91] Morgenstern, *International financial transactions and business cycles*, p. 9, italics in the original.

[92] Oskar Morgenstern, *On the accuracy of economic observations* (Princeton: Princeton University Press, 1950).

Figure 1. Number of national economies undergoing a systemic banking crises starting in a given year according to Laeven and Valencia (2012) from 1970 t0 2012.

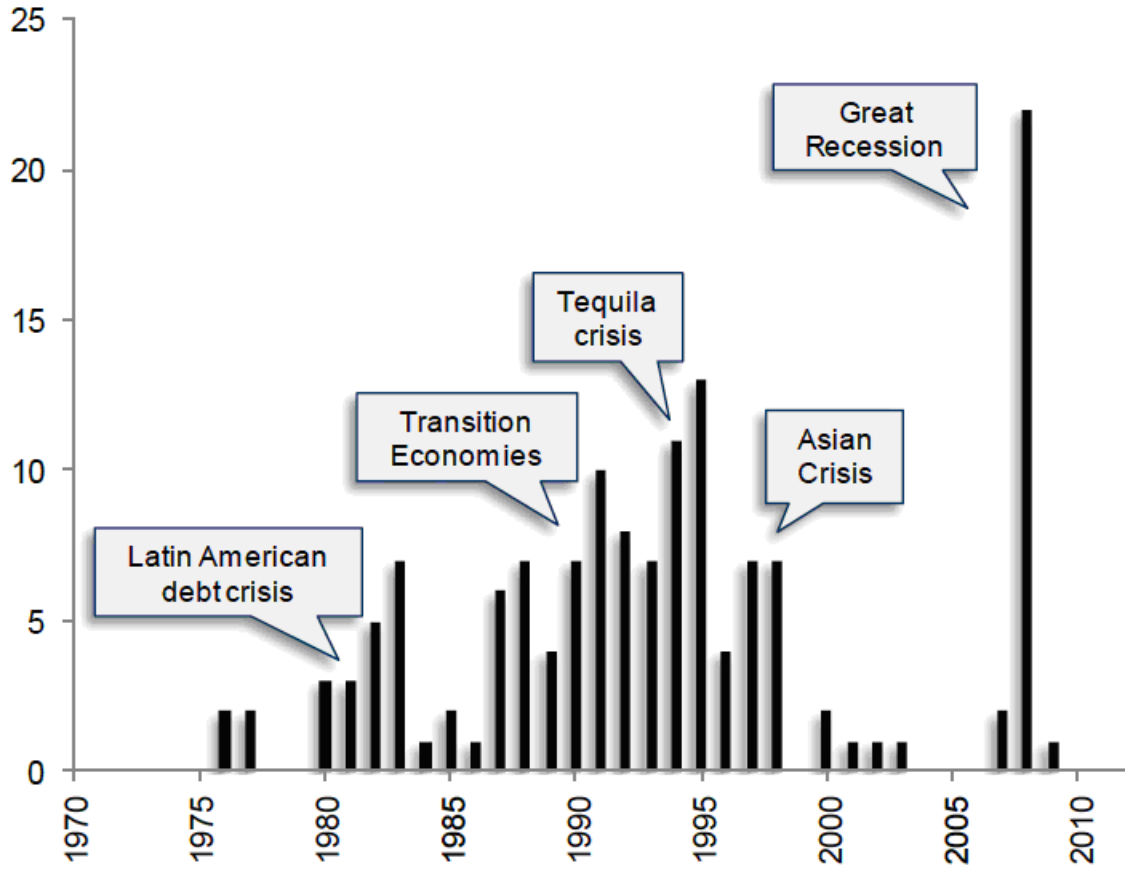
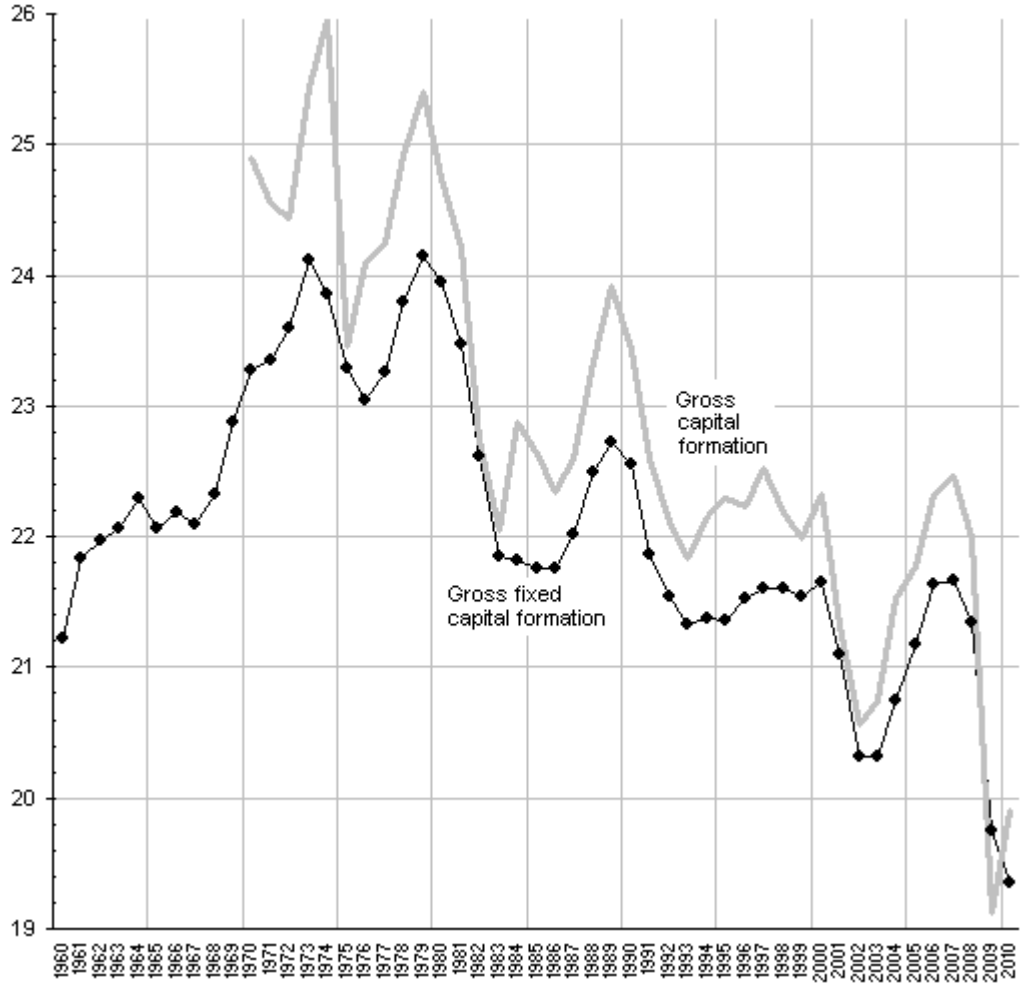


Figure 2. Capital formation as a percent of world GDP.

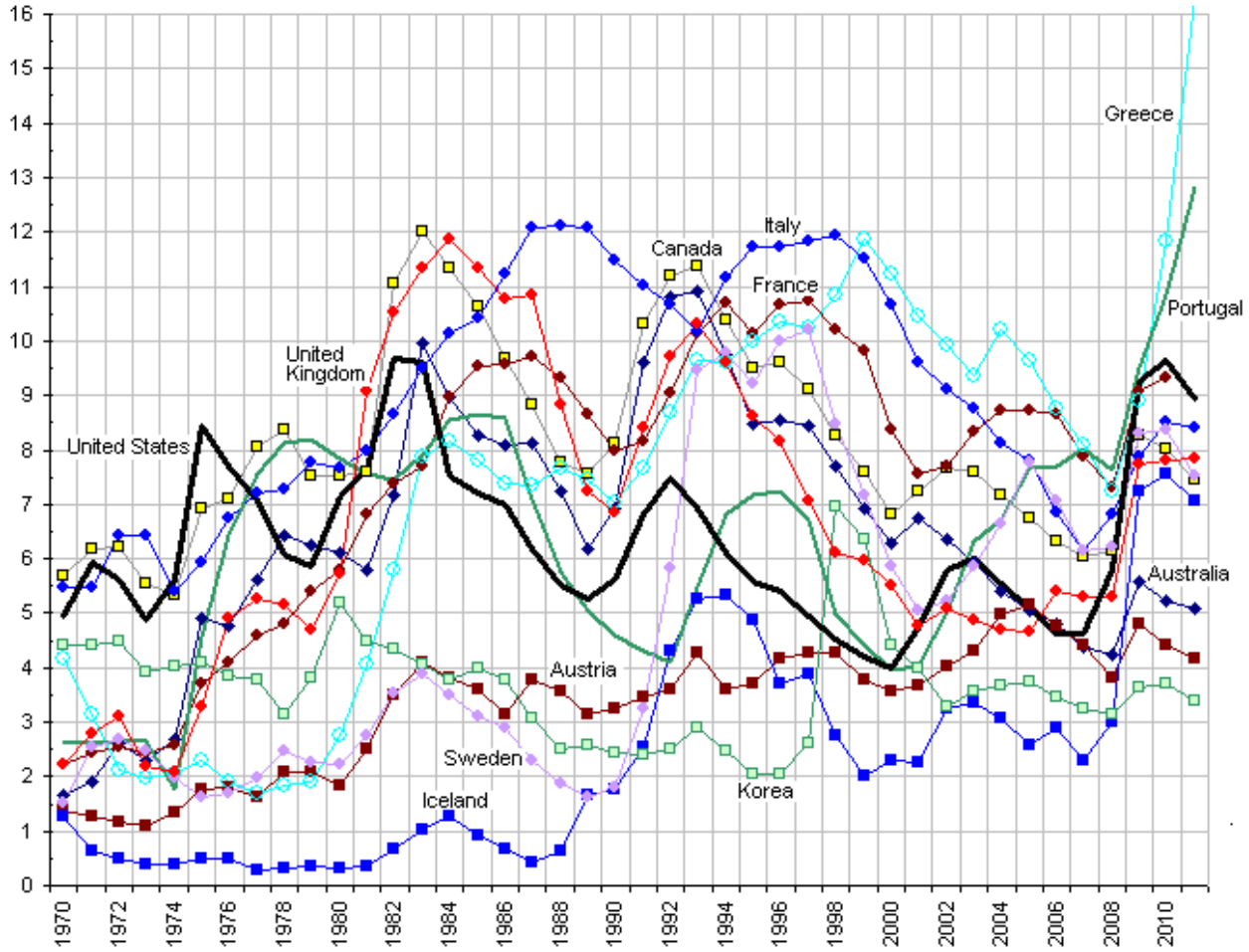


Data source: World Development Indicators, World Bank

Figure 3. Gross capital formation (as a percentage of world GDP, thick gray line, left scale) and annual percentage growth of world GDP (dotted thin black line, right scale).

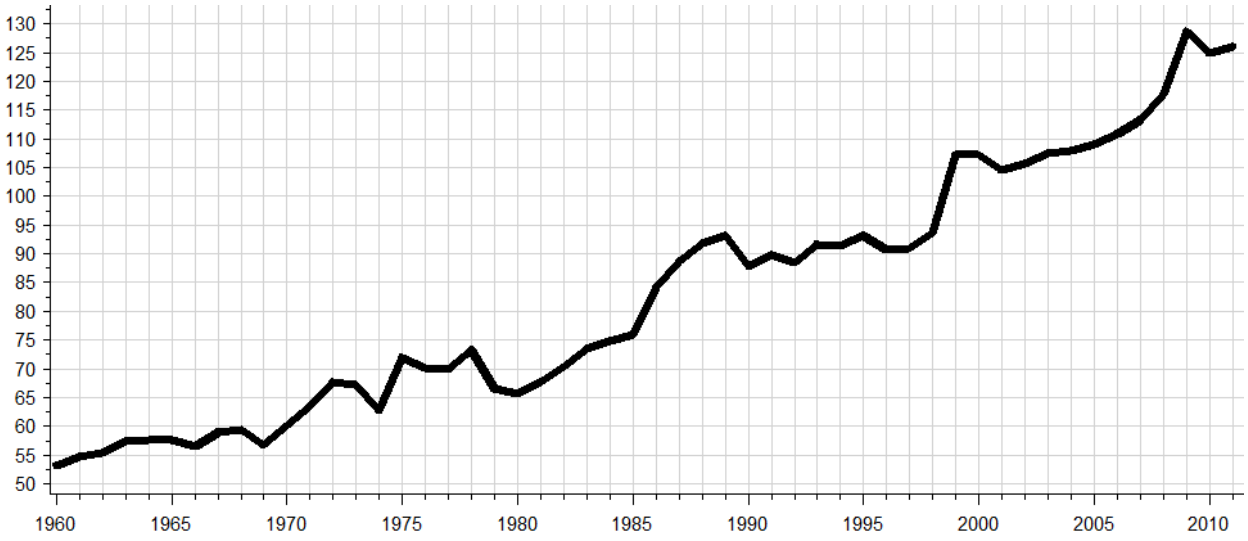
Data source: World Development Indicators, World Bank

Figure 4. Unemployment rates in 12 OECD countries.



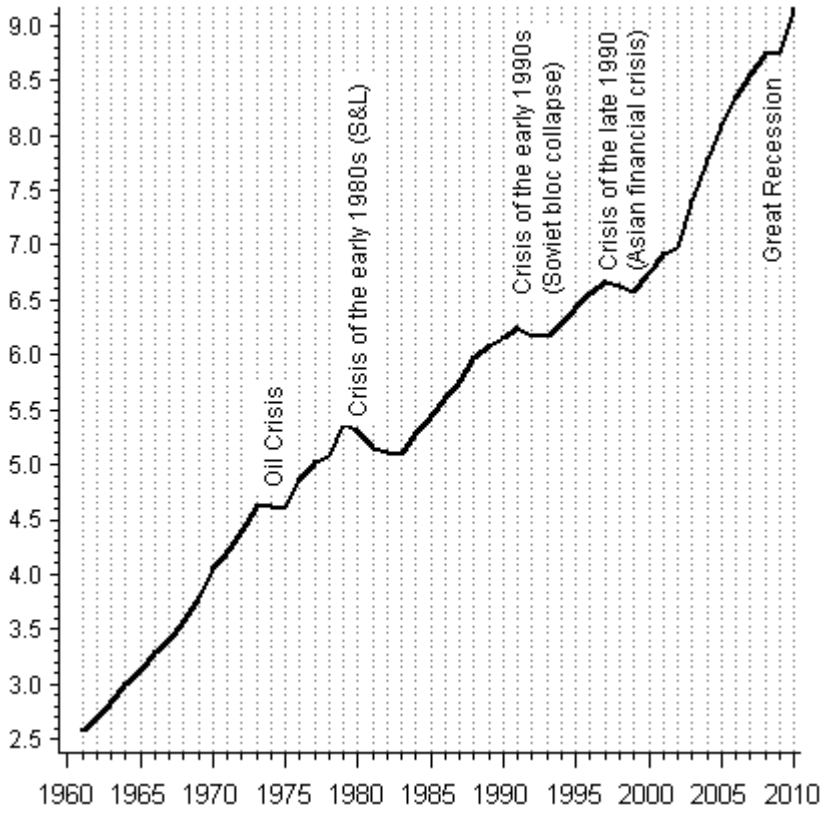
Source: OECD Statistics

Figure 5. Monetary aggregate M2, representing money and "quasi money," as a percentage of world GDP.



Data source: World Development Indicators database, World Bank

Figure 6. CO2 emissions estimated for the world economy in millions of kilotonnes of carbon per year.



Data source: CDIAC.

Figure 7. Annual change in global CO2 emissions (million kilotonnes) and annual change in WGDP (trillion U.S. 1990 dollars)

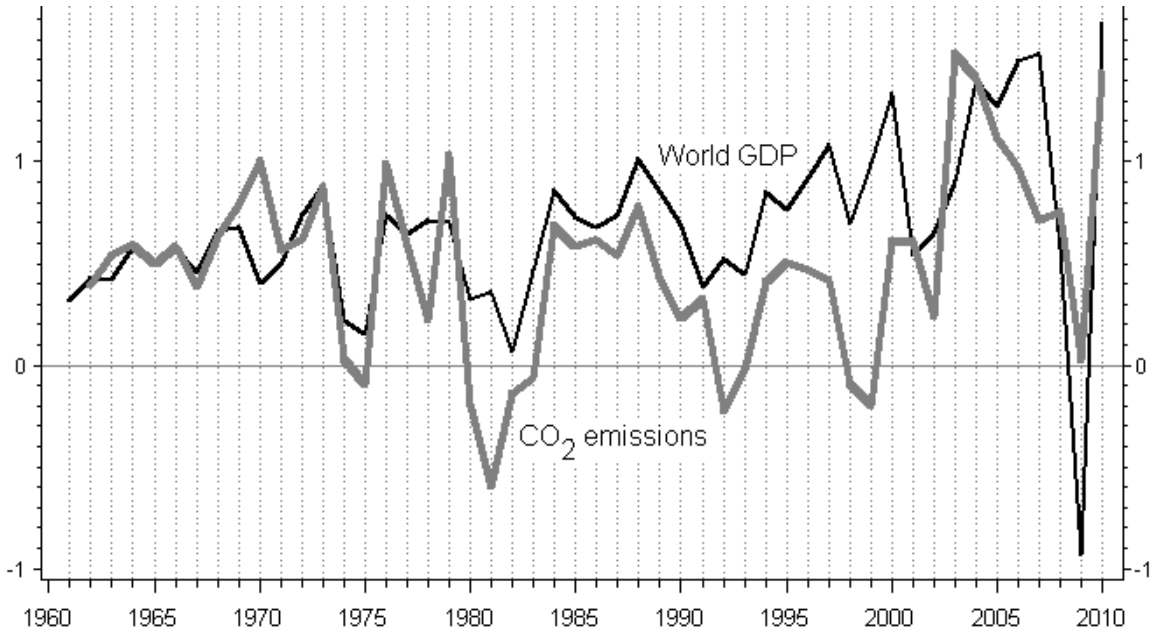
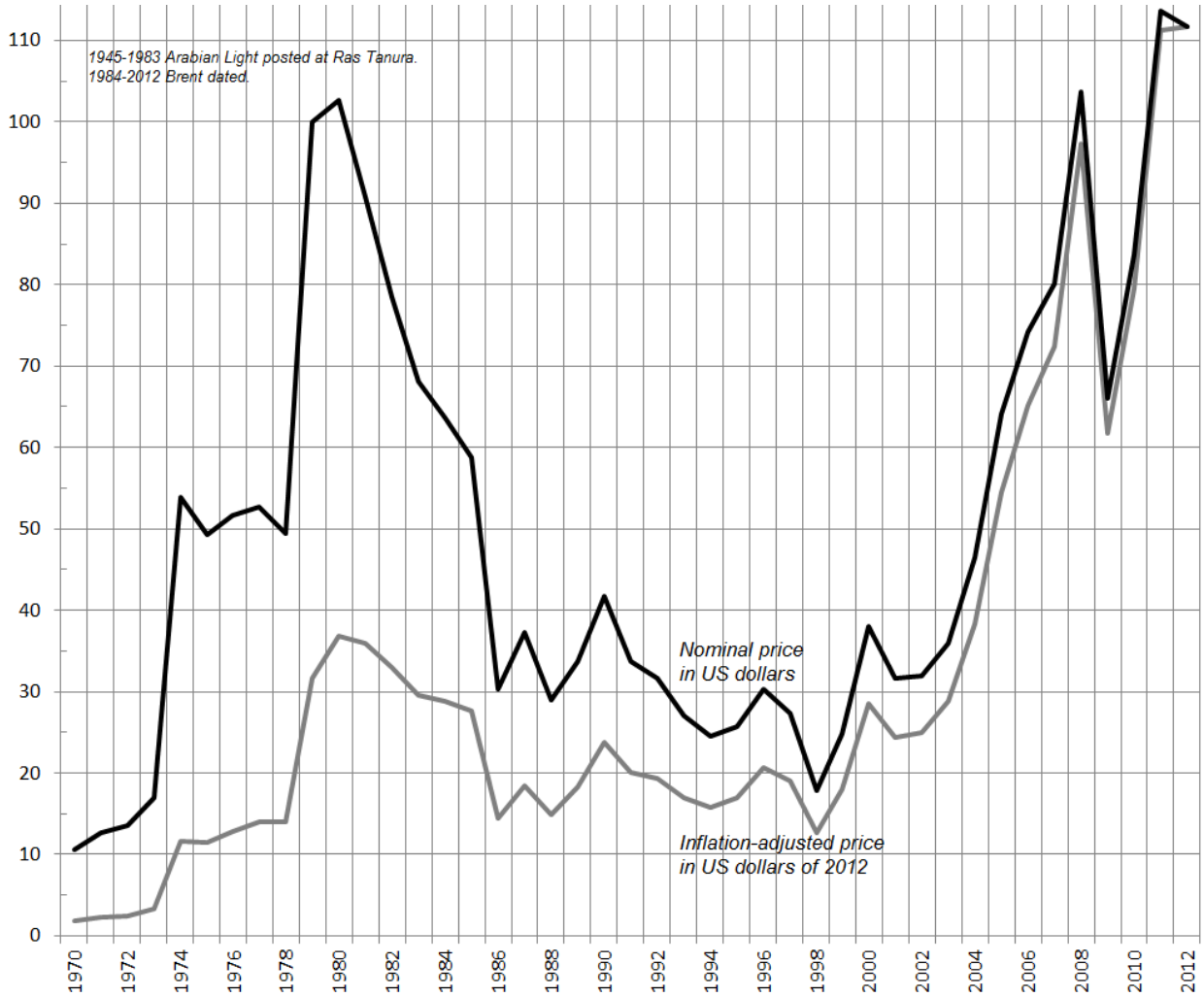
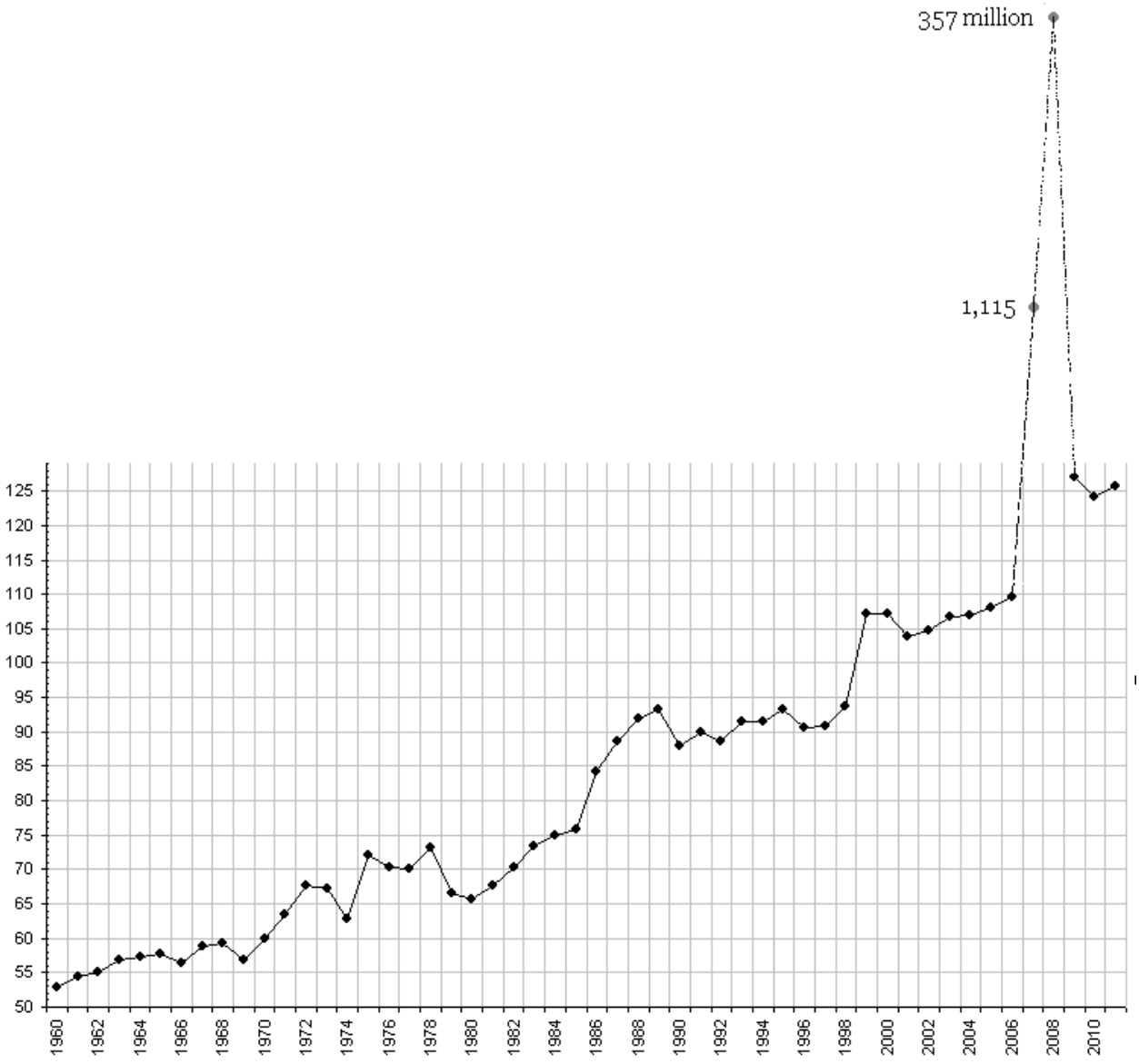


Figure 8. Price of oil, annual means from 1970 to 2012.



Source: BP website, www.bp.com/content/dam/bp/excel/Statistical-Review/statistical_review_of_world_energy_2013_workbook.xlsx

Figure A1. Monetary aggregate M2, representing money and "quasi money," as a percentage of world GDP, as reported by the World Bank in November 2012. As indicated by the absence of vertical scale and grid, the location of the points for 2007 (1,115 percent) and 2008 (357 million percent) is arbitrary.



Source: World Development Indicators database (World Bank). Downloaded November 2012

Table A1. Estimates of money and quasi money (M2) in the world economy, as a percentage of world GDP. Data reported by the WDI dabatase of the World Bank in two different dates.

	Data reported in	
Year	November 2012	July 2013
1960	52.84	53.18
1961	54.37	54.75
1962	55.07	55.44
1963	56.93	57.32
1964	57.23	57.69
1965	57.68	57.66
1966	56.51	56.50
1967	58.86	58.85
1968	59.35	59.35
1969	56.76	56.75
1970	60.02	60.02
1971	63.40	63.41
1972	67.57	67.57
1973	67.24	67.24
1974	62.84	62.83
1975	71.99	71.97
1976	70.22	70.21
1977	70.02	70.00
1978	73.27	73.25
1979	66.62	66.61
1980	65.74	65.70
1981	67.69	67.64
1982	70.38	70.34
1983	73.49	73.45
1984	74.90	74.86
1985	75.94	75.90
1986	84.24	84.20
1987	88.60	88.56
1988	91.91	91.88
1989	93.21	93.18
1990	87.92	87.81
1991	89.85	89.77
1992	88.56	88.52
1993	91.59	91.54
1994	91.42	91.36
1995	93.20	93.15
1996	90.61	90.58
1997	90.90	90.86
1998	93.73	93.72
1999	107.25	107.26
2000	107.15	107.16
2001	103.84	104.51
2002	104.73	105.57
2003	106.63	107.39
2004	106.94	107.76
2005	108.07	108.96
2006	109.60	110.69
2007	1114.98	113.22
2008	357127999019.95	117.67
2009	127.01	128.79
2010	124.08	124.87
2011	125.64	125.98
2012		129.95

Indicator Code FM.LBL.MQMY.GD.ZS

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