Cycles in capitalism

By Michael Roberts to 15th AHE conference, July 2013

Do cycles exist in capitalist economies?

"All of you know that, from reasons I have not now to explain, capitalistic production moves through certain periodical cycles", Karl Marx to Friedrich Engels, 1865

"After more than a quarter-century as a professional economist, I have a confession to make: There is a lot I don't know about the economy. Indeed, the area of economics where I have devoted most of my energy and attention -- the ups and downs of the business cycle -- is where I find myself most often confronting important questions without obvious answers." Greg Mankiw, Harvard economic professor and author of the main economic textbook used in universities, 2011.

Any support for cycles in capitalism usually gets dismissed for two main reasons. The first is that statistics or data showing cycles are spurious and really just an expression of random shocks; or by extension, there are so few turning points in the longer cycles that no statistical significance can be applied. The second is that there is no theoretical model that can explain apparent economic cycles and, without that, the search for cycles is pointless.

In this paper, I tentatively suggest that these criticisms can be overcome and cycles probably exist as part of the laws of motion of capitalism and can be modelled by economic theory, in particular by Marx's theory of capitalist accumulation and crisis. I integrate various cycles identified in modern capitalism to explain why capitalism has experienced a deep slump and an ensuing Long Depression.

But what is a cycle? It has been described as a 'harmonic wave'[1]. It comes from some sort of *restorative force*. With a restorative force, being up high is what makes you more likely to come back down, and being low is what makes you more likely to go back up. Just imagine a ball on a spring; when the spring is really stretched out, all the force is pulling the ball in the direction opposite to the stretch. This causes cycles.

In mainstream economic models, 'business cycles' are not cycles under this definition. They are modelled as 'shocks' to an equilibrium trend. After a temporary shock, the system reverts to the mean (i.e., to the "trend"). This is very different from harmonic motion. In the mainstream model, boom need not be followed by a bust.[2]

But the idea that all deviations from trend growth or equilibrium are simply random shocks or temporary does not hold water. There are plenty of detailed case studies from baseball, elections,

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[1] Noah Smith (2012)

[2] There is a new approach in mainstream economics, Hidden Semi-Markov Model, or HSMMs. In an HSMM, there are two "states" of the economy - a good state, and a bad state. But transitions between these states are abrupt and sudden, rather than smooth as in a harmonic wave. In an HSMM, *the likelihood of a transition increases as the time since the last transition increases*. In other words, the longer your economy stays in a "boom" state, the bigger the chances that you're about to suddenly experience a crash and a transition to a "bust" state. Again this is not the same as a pure harmonic cycle.

climate change, the financial crash, poker and weather forecasting of significant changes from the norm that are not temporary or insignificant[3].

Of course, everything depends on the quality of your 'priors', from which statistical techniques can provide degrees of probability for outcomes. The best economic theory and explanation comes from looking at the aggregate, the average and its outliers. In short, defining and identifying cycles is not impossible and if found can deliver significant explanatory power.

What Marx said on cycles

"Once the cycle begins, it is regularly repeated. Effects, in their turn, become causes, and the varying accidents of the whole process, which always reproduces its own conditions, take on the form of periodicity' (CI, 633).

Marx spent some considerable time and research in trying to identify cycles in the capitalist economy[4]. He looked in particular for periodicity in cycles. Right up to the end of his research on the capitalist economy, Marx continued to look for cyclical movements. He wrote to Engels at the end of May 1873 about *`a problem which I have been wrestling with in private for a long time'. He had been examining `tables which give prices, discount rate, etc. etc.'. `I have tried several times –- for the analysis of crises –- to calculate these ups and downs as irregular curves, and thought (I still think that it is possible with enough tangible material) that I could determine the main laws of crises mathematically.* (31.05.73, CW44, 504).

Marx saw the immobility of fixed capital as a part of the explanation of the periodicity of the cycle. He thought that duration of the accumulation cycle (boom and slump) was about five to seven years, a view which he revised when the expected crisis did not strike in 1852 in favour of ten years.

In the course of his research Marx developed the idea that the cycle was connected with the replacement of fixed capital. On this basis, he argued, *`there can be no doubt at all that the cycle through which industry has been passing in plus ou moins ten-year periods since the large-scale development of fixed capital, is linked with the total reproduction phase of capital determined in this way. We shall find other determining factors too, but this is one of them.'* (CW29, 105)

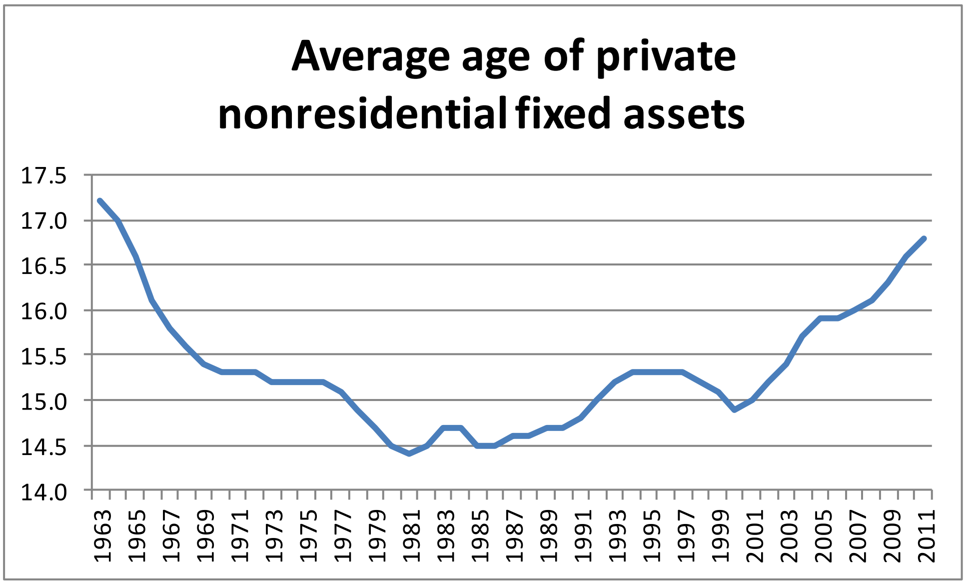
Engels told Marx that it was normal to set aside 7 1/2% for depreciation, which implied a replacement cycle of 13 years, although he noted 20 and 30-year old machines still working.(04.03.58, CW40, 279–281). Marx concluded that *`The figure of 13 years corresponds closely enough to the theory, since it establishes a unit for one epoch of industrial reproduction which plus ou moins coincides with the period in which major crises recur; needless to say their course is also determined by factors of a quite different kind, depending on their period of reproduction. For me the important thing is to discover, in the immediate material postulates of big industry, one factor that determines cycles'* (05.03.58, CW40, 282).

The key point for Marx was that "*the cycle of related turnovers, extending over a number of years, within which the capital is confined by its fixed component, is one of the material foundations for the periodic cycle [crisis] ... But a crisis is always the starting point of a large volume of new investment. It is also, therefore, if we consider the society as a whole, more or less a new material basis for the next turnover cycle'* (CII, 264). So Marx connected his theory of crisis to cycles of turnover of capital.

[3] Nate Silver (2012)
[4] See Simon Clarke (1995)

Marx considered that "*So far the period of these cycles has been ten or twelve years, but there is no reason to consider this a constant figure.*" Indeed, he thought that the cycle of replacement capital would shorten. However, later Engels began to argue that "*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 –- taking place in the various industrial countries at different times.*" (CIII,477n).

How close Marx and Engels were right on their estimate of the replacement cycle? The US BEA provides data on the age structure of replacement for private non-residential fixed assets. This is how it looks.



I have excluded the war and immediate post-war years and started from 1963 when the US rate of profit peaked and began to fall. It seems that the age structure fell from about 17 years to 14.5 years at the turning point in US profitability that began after the slump of 1980-2. From 1982, the organic composition of capital fell and investment growth slowed. The age structure rose back towards 17 years. What is clear is that if the replacement of fixed assets is the model for explaining any cycles in capitalist accumulation, then the cycle can be expected to be around 15-17 years.

Is there a profit cycle?

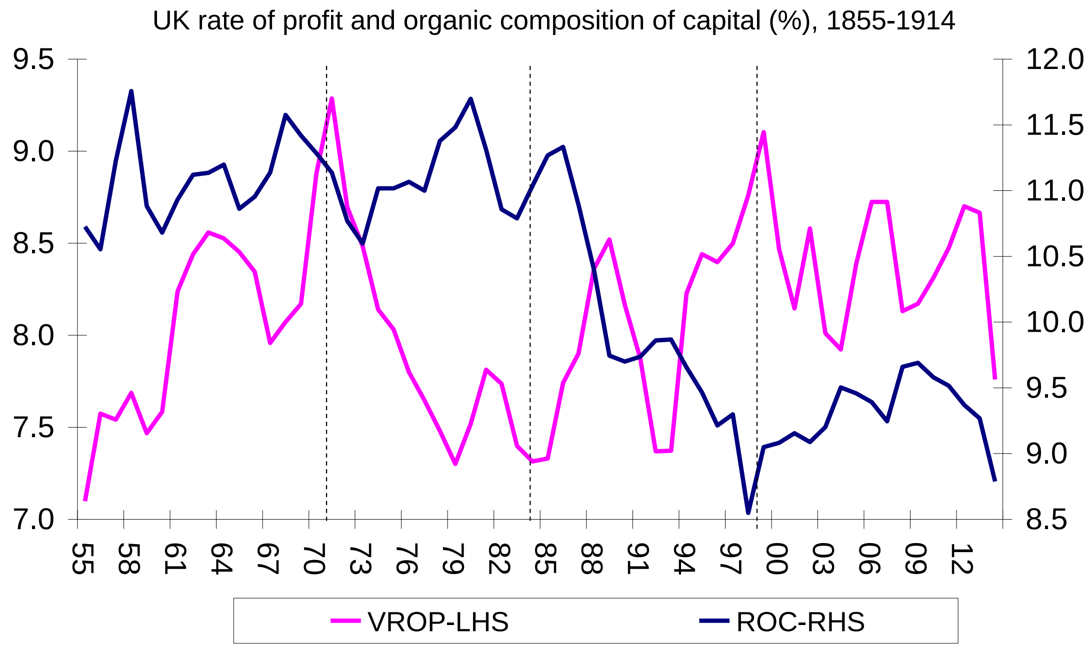
Britain in second half of 19th century

The accumulation of capital, including fixed assets, under capitalism depends on its profitability for the owners of capital. From that fundamental premise (prior), if there is a replacement cycle of some duration in any capitalist economy, there is likely to be a cycle of profitability. Can we discern that?

I consider two case studies here: the British economy when it was the hegemonic capitalist economy during Marx's time from 1850 to 1914; and the US economy in the post-WW2 period.

By the beginning of the second half of the 19th century, Britain was the leading capitalist power by some way. Through the second half of the 19th century, it remained the leading economic, financial, military and political power. In that sense Britain between 1850 and 1914 was in a similar position to the US between 1945 and 2010. It was the most important and advanced capitalist state but its relative superiority was declining.

As we have seen, Marx found it difficult test any of his hypotheses against empirical evidence[5]. However, we now have better data[6]. We can now plot the rate of profit in Marxist terms.



First, The graph shows that the rate of profit for the UK economy between 1855 and 1914 moved in a cycle of about 30-plus years from trough to trough, or in two phases of about 15 years each. The up phase of 1885 to 1871 was followed by a down phase from 1871 to 1884, a period noted for frequent and deep recessions – indeed the decade of 1880s was considered a Great Depression like the 1930s. After 1884 we get another (volatile) up phase in the rate of profit until 1899. Finally, there was a fall back in profitability from 1900 up to the start of the 1914 war.

The data show that the main reason for the cycle of profitability under British capitalism between 1855 and 1914 was the movement in the organic composition of capital. There is a significant inverse relationship between the organic composition and the rate of profit.

The US post-war cycles

In the second case for the US economy from 1946 to 2007, we find a similar profit cycle with upwaves and downwaves, each of about 15-17 years. In the first wave, which I have called the Golden Age, profitability was very high throughout. And after falling back in the 1950s, it rose to reach a peak in 1965. From then, the organic composition of capital rose and the rate of profit fell to reach a low in the economic recession of 1982. The rate fell sharply in the first great post-war economic recession of 1974-5. But the seeds had been set for these falls by the steady decline in the rate of profitability from 1966. By 1982 after two big economic recessions, such was the reduction in the organic composition of capital, the rate of profit steadily rose, apart from the merest of pauses in the recession of 1990-2, up to a new peak in 1997. After 1997, the rate of profit declined. The graphic suggests that we are now in the downwave of the profit cycle similar to the period 1965-82.

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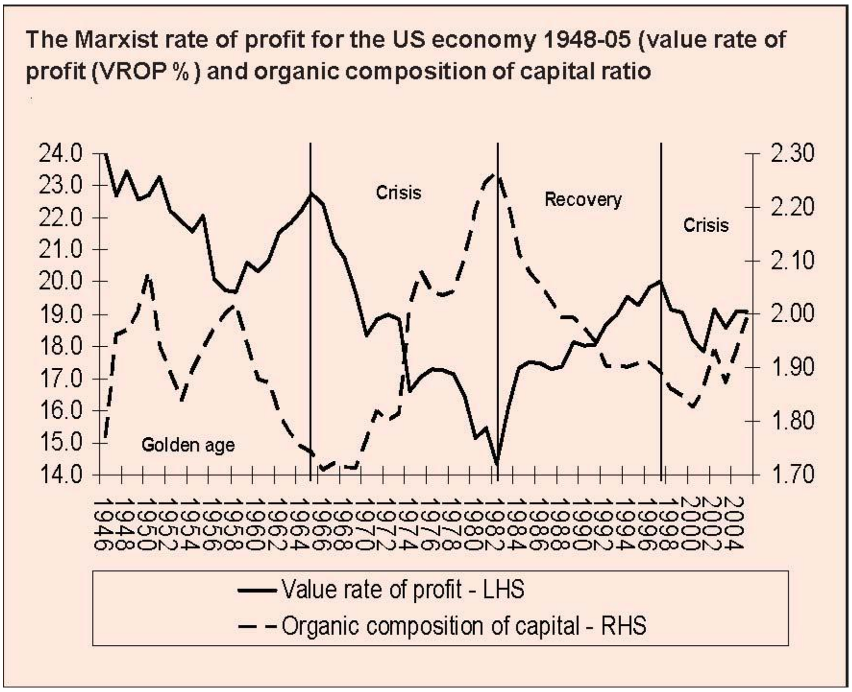
[5] Sources of all data, See Roberts (2009)
[6] Arnold, McCartney (2002)



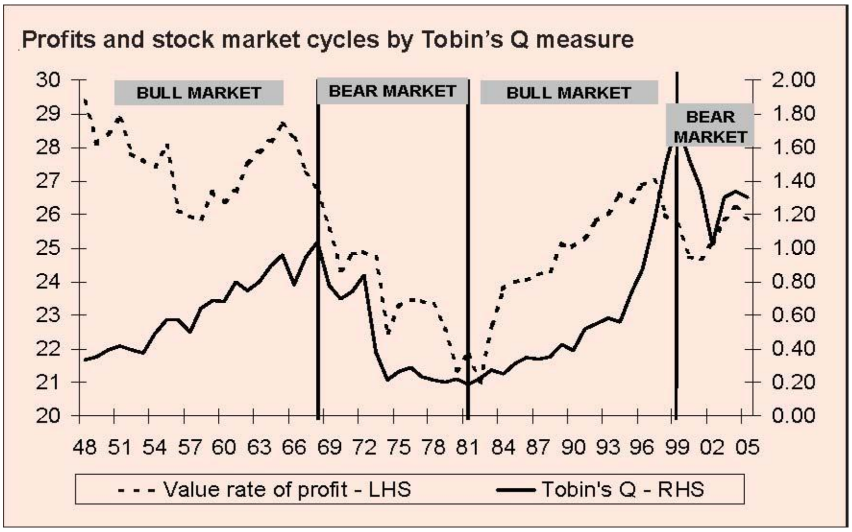
These two studies provide an interesting correlation between the cycle of profitability and the cycle of capital replacement and thus evidence of cycles under capitalist production, as Marx asserted.

The stock market cycle

We can link the cycle of profitability to another cycle: the movement of share prices. The prices of the shares of US capitalist companies in aggregate also appear to move in cycles, with up and downwaves of about 16 years, very similar to the profit cycle. Investment analysts call the upwave in stock market prices a bull market and the downwave a bear market. These are very long periods for broadly one direction for stock prices to go. So these phases are called *secular* bull or bear markets.

So does the stock market price index move up and down with the rate of profit under capitalism? The answer for the US is that it does, although the stock market cycle does not coincide exactly with the profit cycle.

As we know, the rate of profit peaked in 1965, then fell to a low in 1982. Then we entered a rising wave until 1997, after which we appear to be in a downwave. The US stock market cycle follows a similar pattern. That close relationship can be established by measuring the market capitalisation of companies in an economy against the accumulated assets. Tobin's Q takes the 'market capitalisation' of the companies in the stock market (in this case the top 500 companies in what is called the S&P-500 index) and divides that by the replacement value of tangible assets accumulated by those companies (these figures are provided again by the US Bureau of Economic Analysis and by the S&P's data on company accounts). The replacement value is the price that companies would have to pay to replace all the physical assets that they own (plant, equipment etc)



So Tobin's Q measures the value that speculators on the stock exchange can get over or below the actual real value of the company's assets. As we can see from the graphic, for the period 1948-05, Tobin's Q starts at about 0.33 in 1948. So the value of stock market shares was approximately only one-third of the real value of the assets owned by the companies — very cheap. It rose to nearly 1.04 in 1968. That was the peak of the Tobin Q then. Afterwards it fell back to just 0.19 in 1981. That was the trough. From 1982, it rose to reach 1.75 in 1999. So the stock market value was 75% over the real value of the company's assets. From 1999, it fell back to 1.02 in 2002, but then rallied somewhat to 1.30 last year.

So there was a secular bull market from 1948 to 1968, followed by a bear market until 1981 and then another bull market until 1999. The US stock market cycle appears pretty much the same as the US profit cycle, although slightly different in its turning points. Indeed, the stock market seems to peak in value a couple of years after the rate of profit does. This is really what we would expect, because the stock market is closely connected to the profitability of companies, much more than bank loans or bonds. When the rate of profit enters its downwave, the stock market soon follows, if with a short lag.

The credit cycle

The global banking collapse and the subsequent Great Recession have led to significant new research on the causes of crises that are related to the expansion of credit, or what Marx called fictitious capital. There is a continuing debate on the role of fictitious capital in crises and on the relation between the productive and financial sectors of the capitalist economy.[7].

That will not be dealt with here. But new research has started to identify a credit cycle at least in the major capitalist economies with a duration of 16-18 years. Claudio Borio finds what he calls a 'financial cycle' using a composite of property prices (house prices to income) and changes in credit (credit to GDP)[8]. Borio is struck by the fact that the duration is longer than the 'business cycle'. Interestingly, his financial cycle matches the length of the profit cycle identifies above. It appears to run inversely with the profit cycle at least in the US – namely that when profitability is its downward phase, the financial cycle is its upward phase. The financial cycle peak heralds a banking crisis, as in the late 1980s and of course 2007. Borio argues that the build up of debt becomes a burden at some point and thus

[7] See Roberts M, blog
[8] Borio (2012)

triggers the crisis.

Kondratiev cycles

"We consider long cycles in the capitalistic economy only as probable"[9] N Kondratiev

Can we talk about even longer cycles in capitalist production? Just as the capitalist profit cycle appears to be spread over approximately 32-36 years from trough to trough and so does the stock market cycle, there also appears to be a cycle in prices that is about double that size, or around 64-72 years. This cycle was first identified properly by Nicolai Kondratiev, a Russian economist, in the 1920s. He argued that there appeared to be a period when prices and interest rates moved up for about 27 years and then a period when the opposite occurred.

Kondratiev 'long cycles' have been attacked at three levels[10]. First, it is argued that there is no firm statistical evidence that such cycles of 50 years or more really exist. There are few data points and the economic series analysed by Kondratiev have been considered unconvincing[11].

Second, Kondratiev's argument that cycles should be considered endogenous to the capitalist mode of production has been rejected. The alternative consensus is that changes in the relative pace of economic growth or in prices of production are caused by external factors like wars, revolutions, disease, weather or more specifically new stages of capitalist economic organisation (imperialism, financialisation etc)[12].

Third, there is no convincing theory or model to explain these long cycles, if they do exist.

Kondratiev defended his theory of long cycles from all these criticisms. He admitted that the available data were inadequate to *"assert beyond doubt the cyclical character of these cycles. Nevertheless, the available data were sufficient to declare this cyclical character to be very probable".* In particular, the time series for prices of production and commodities bore the greatest support for cycles *"and cannot be explained by external random causes".*

Kondratiev followed Marx in reckoning the long duration of the cycles was based on the gestation period of large capital projects that could not be completed in the normal business cycle and these investments would take place in a series of waves[13]. He rejected criticism that any long cycles were caused by exogenous factors. *"Crossing through different stages, capitalism remains capitalism and maintains its basic features and regularities. Otherwise how could these stages be stages of capitalism?...I am not aware that the law of value and prices or the law of profit and its conjunctural fluctuations is absolutely different at different stages of capitalist development so as to preclude generalisation."*

Later scholars have provided empirical support for endogenous Kondratiev cycles. Goldstein found that *"empirical analysis strongly corroborates long waves in price data both before and after the onset of industrialisation in the late 18h century. Price waves are synchronous among various European countries, reflecting the expansion of the core of the world system*

[9] Kondratiev (1922), p255
[10] Garvey 1943
[11] Garvey op cit p 211
[12] See Trotsky (1923) and Richard Day (1976)
[13] Kondratiev (1928)

and its increasing integration in the industrial era." [14] Walter Rostow found good evidence for 50-year long waves in commodity prices[15] Theoretical and empirical backing has been developed for Kondratiev's suggestion that long cycles are the result of clusters of innovation or long duration capital projects.[16] And Ernest Mandel attempted to link long cycles to movements in profitability, although he claimed rather oddly that the downphase in such cycles was endogenous to capitalist production but the upphase was exogenous.[17]

Can we bring together the claimed Kondratiev prices of production cycles and the cycles of profitability discerned earlier for the UK in the 19th century and the US in the 20th century? The figure shows K-cycles on the left hand side, with the phases of the profit cycle. The first K-cycle begins in about 1785, rises to a prices peak around 1818 and then goes to a trough in the early 1840s. The second cycle peaked in the mid-1860s and then troughed in the mid-1880s or early 1890s. The third K-cycle peaked in 1920 and troughed in 1946. The fourth K-cycle peaked in 1980 and will trough around 2018. On these schema, the K-cycle has been lengthening in duration from Kondratiev's time from about 55 years to 64 years in the third cycle and 72 years in the fourth cycle.

	Profit cycles	
K-cycle 1 (58 years)	1785- 1802	Spring UP
1786-1815 PEAK	1802-1815	Summer DOWN
1815-1844 TROUGH	1815-30	Autumn UP
	1830-44	Winter DOWN
K-cycle 2 (48 years)	1844-49	Spring UP
1844-71 PEAK	1849-59	Summer DOWN
1871-92 TROUGH	1859-71	Autumn UP
	1871-92	Winter DOWN
K-cycle 3 (54 years)	1892-99	Spring UP
1892-1920 PEAK	1899-1918	Summer DOWN
1920-46 TROUGH	1918-29	Autumn UP
	1929-46	Winter DOWN
K-cycle 4 (72 years)	1946-65	Spring UP
1946-82 PEAK	1965-82	Summer DOWN
1982-2018? TROUGH	1982-97	Autumn UP
	1997-2018?	Winter DOWN

[14] Goldstein 1988. P209

[15] Rostow W, 1978

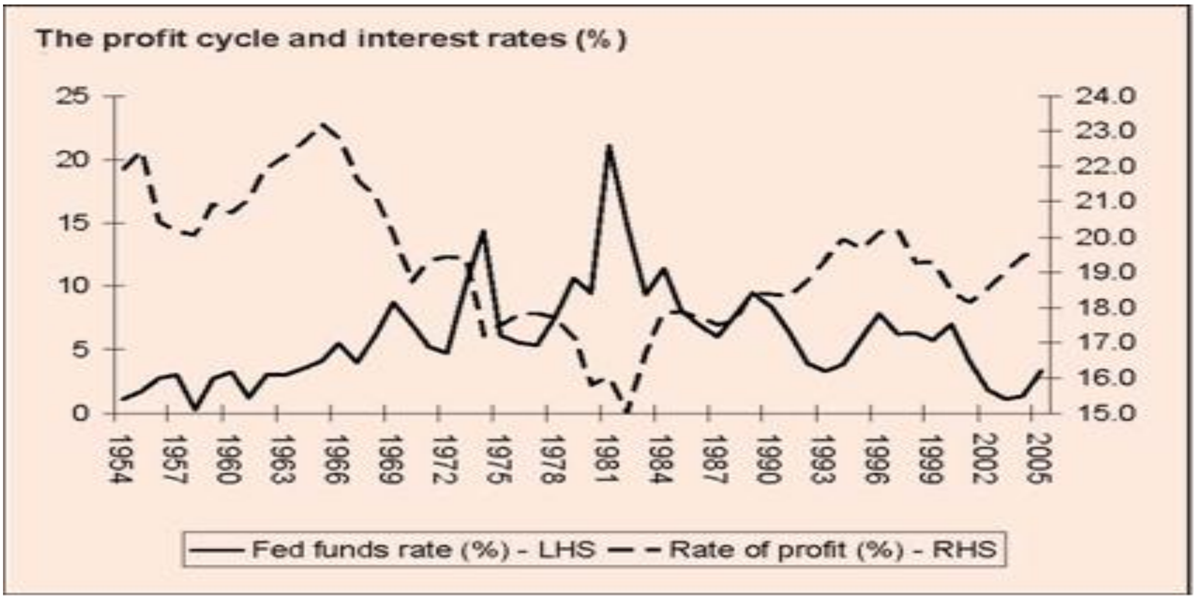
[16] Volland, Van Duijn, Freeman, Schumpeter There are two other capitalist economic cycles that add support to that conclusion. The most important under modern capitalism is the innovation cycle. The Austrian bourgeois economist, Joseph Schumpeter, a close reader of Marx's ideas, reckoned that the volatility of capitalism depended on investment in new technology. Schumpeter called this process 'creative destruction' So a cycle of new technology would start after a major slump, but the new technology would not be developed until the profit cycle moved into an upwave. Then there would be a take-off of the new technology. The change from innovation, take-off, maturity and decline could take 70 years — not dissimilar to the length of the whole Kondratiev.

[17] Mandel (1982) and see Day 1976

Various reasons have been proposed for the lengthening of the cycle including demographics and government debt financing[18]. The argument of this paper is that the K-cycle now follows much more closely the cycle in profitability as the capitalist mode of production has become dominant.

The right side of the figure shows how the profit cycle integrates with the K-cycle into what have been called four seasons: spring (rising profitability); summer (falling profitability) alongside the rising phase of the K-cycle; and then autumn (rising profitability) and winter (falling profitability), alongside the declining phase of K-cycle. In the winter phase, the model would expect to reveal a period of depression (falling prices or slowing inflation alongside or high or rising unemployment and poor economic growth). Previous winter periods have been the 1840s, the 1880-90s (the first Great Depression) and the 1930s (the Great Depression) and we are now in one (The Long Depression).

Interest rates are a very good proxy for the Kondratiev prices cycle. If we look at the period from 1946 again, the graphic shows that the level of the US short-term interest rate (the Fed Funds rate, it is called, as set by the Federal Reserve Bank, America's central bank), rose from 1946 to a peak in 1981 and then fell back after that.



There are three more cycles of motion that operate under modern capitalism: the cycle in real estate prices and construction, the cycle of economic boom and slump (the so-called business cycle); and the inventory cycle.

There appears to be a cycle of about 18 years based on the movement of real estate prices. The American economist Simon Kuznets discovered the existence of this cycle back in the 1930s[19]. We can measure the cycle in the US by looking at house prices. The first peak after 1945 was in1951. The prices fell back to a trough in 1958. Prices then rose to a new peak in 1969 before slumping back

[18] Alexander M, 2002
[19] Kuznets 1930

to another trough in 1971. The next peak was in 1979-80 and the next trough was in 1991. Assuming an 18-year cycle, then the next trough in US house prices should have been around 2009-10[20]. It was.

The real estate cycle is clearly not in line with the Marxist profit cycle, the stock market cycle or the Kondratiev prices/money cycle. These latter cycles are products of the laws of motion of capitalist accumulation. They operate in the productive sector of the economy. In contrast, the real estate cycle operates in the unproductive sector of the capitalist economy. Housing is a big user of consumer income. So the cycle in house prices reflects <u>the spending behaviour</u> of capitalists and workers, not the profitability of capital. For these reasons, the real estate cycle has different timings in its turns than the profit cycle. As we saw in previous chapters, the profit cycle reached a trough in 1982 before rising for 15-16 years to peak in 1997.The stock market cycle also troughed in 1982 and then ran up to a peak in2000, 18 years later. In contrast, the US real estate cycle troughed some nine years later in 1991 and only reached its peak in 2005.

Clement Juglar[21] was the first bourgeois economist to notice a business cycle of about ten years. This cycle of economic growth and recession now seems to be about 9-10 years. That is the average time between trough and trough (or recession and recession) in the recent period. Capitalist economists define a recession as two consecutive quarters of a fall in GDP, or annual output, after taking out inflation. On that basis, there have been seven economic recessions over the last 60years, with varying degrees of severity and length.

The Juglar cycle has different turning points from the Marxist profit cycle, for two reasons. First, the cycle is of the whole economy, the productive and unproductive sectors, including the government sector. Thus the movements in the profit cycle and the productive sectors of capitalism feed through with a lag to the rest of the economy. The turns in the profit cycle since the war have been in 1948, 1965, 1981 and 1997. The turns in the Juglar cycle were in 1958, 1971, 1980-2, 1991 and 2001.

Second, the Juglar cycle seems to be engendered by the decisions of capitalists to invest in constant and variable capital (machinery and workers). Profitability rises and after a while businesses start to employ more workers. As the cycle picks up, then they decided to invest more in machinery. This eventually leads to a fall in the rate of profit. Once this affects the mass of profit for capitalists across the board, they start laying off labour, making machinery idle or even closing down. This crisis takes some time to ensure after the profitability turning point. And the recovery also lags the recovery in profitability

Finally, there is an even shorter business cycle of about 4-5 years. Joseph Kitchin discovered this in the 1930s[22]. This cycle seems to be the product of even more short-term decisions by capitalists on how much stock to keep to sell. It seems that capitalists cannot see further ahead than about2-4 years. They expand production and maximise the utilisation of existing production capacity. In the struggle to compete, capitalist producers end up with more stock than they can sell. So production is slowed until stocks are run down.

We can tentatively integrate these various cycles. In other words, the long Kondratiev cycle of 64-72 years can be divided downwards to the short Kitchin cycle of 4-5 years. Thus, there are two profit cycles in the Kondratiev cycle, four Kuznets cycles, eight Juglar cycles and 18 Kitchin cycles.

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[20] Roberts 2009: "If the US house price bubble finally burst in 2005, we can expect US house price rises to slip back and fall, at least relative to overall inflation, over the next four years".
[21] Juglar, 1856
[22] Kitchin J 1923

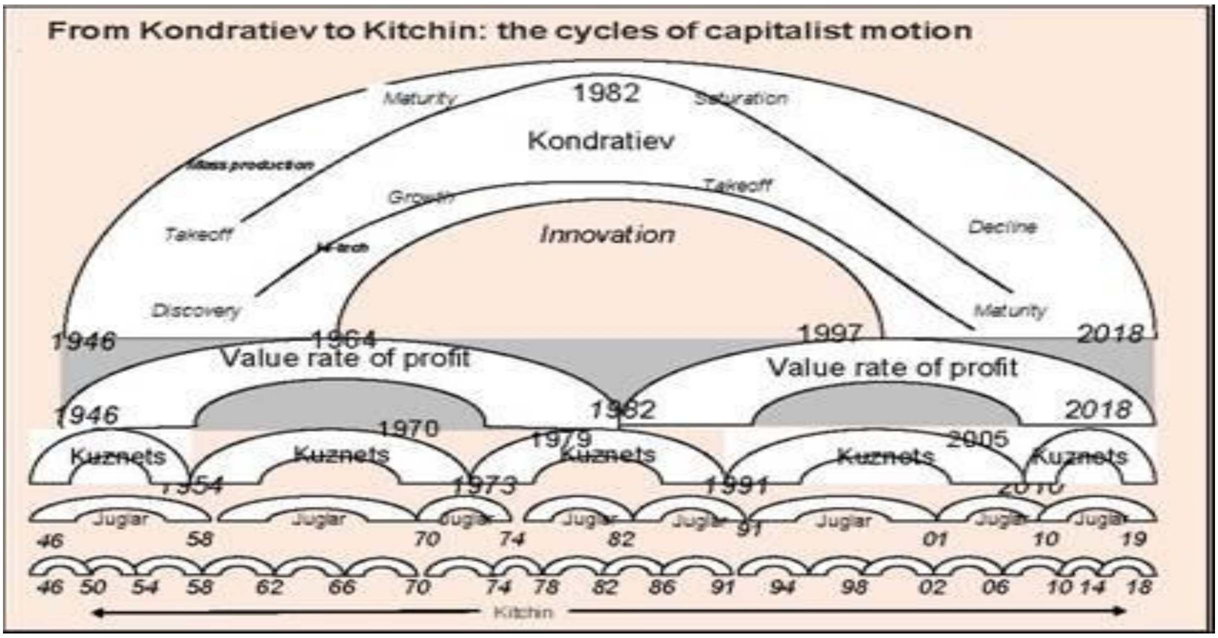
The profit cycle is key though. The upwave in the profit cycle from1946-65 coincided with the upwave in the Kondratiev cycle. Thus the troughs in the Juglar and Kuznets cycles in the mid-1950s did not produce a very deep recession or downturn in economic growth and employment. Because the Kitchin cycle troughed also in 1958, the ‘pause’ was longer than in 1954. But high and rising profitability in an environment of a Kondratiev upwave was generally good news for capitalism.

From 1965-82, the rate of profit fell. The Kondratiev cycle was still in an upwave of prices though. So what we got was successively worse economic slumps (1970, 1974 and 1980-2) alongside rising prices — in other words ‘stagflation’. In 1974, the Kuznets, Juglar and Kitchin cycles troughed together. In an environment of falling profitability, world capitalism suffered its first post-war simultaneous economic slump. The 1980-2 recession was so deep and long-lasting because it was when profitability reached lows and the Kondratiev prices cycle peaked. But the real estate Kuznets cycle was also at a peak, so output and employment fell while prices stayed up — the ultimate stagflation crisis.

The next upwave of profitability (1982-97) coincided with the downwave in the Kondratiev prices cycle, which we are still in. Thus rising profitability was accompanied by falling inflation, from 15% in 1982 to just 2-3% by the late 1990s. Rising and high profitability (by 1997) also meant that the Juglar growth troughs of 1991 and 2001 were not nearly as deep or severe as 1974 and 1980-82. The Kuznets cycle troughed again in 1991, making the 1991 economic recession much more severe than the 2001 recession when the housing market in the US and elsewhere was booming.

We are now in another profit downwave that should not bottom until around 2015. So output and employment slumps should be as severe and long-lasting as they were in 1974-5 and 1980-2. This profit downwave now coincides with the downwave in the Kondratriev prices cycle that started in 1982 and won’t reach its bottom until 2018. [23]

In the figure below, I integrate these various cycles of capitalism.



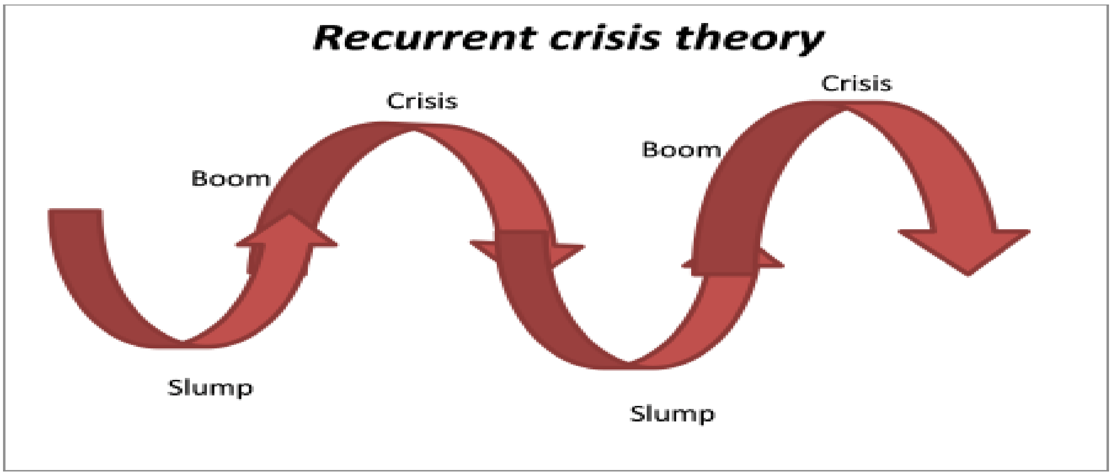
[23] Roberts 2009: “There has not been such a coincidence of cycles since 1991. And this time (unlike1991), it will be accompanied by the downwave in profitability within the downwave in Kondratiev prices cycle. It is all at the bottom of the hill in2009-2010! That suggests we can expect a very severe economic slump of a degree not seen since 1980-2 or more” (written in 2005).

Eventually, the winter phase of the current K-cycle will give way to a Kondratieff spring in the 5th K-cycle. From 2014-16, capitalism enter an up phase on the back of capital destruction from a series of slumps in the winter phase. Labour would also gradually renew its strength. From 2030, we would enter another Kondratiev summer, when profitability would fall, capitalism would be in crisis again and class struggle would reach a peak. This would last until 2046 -This is really what we call the long view!

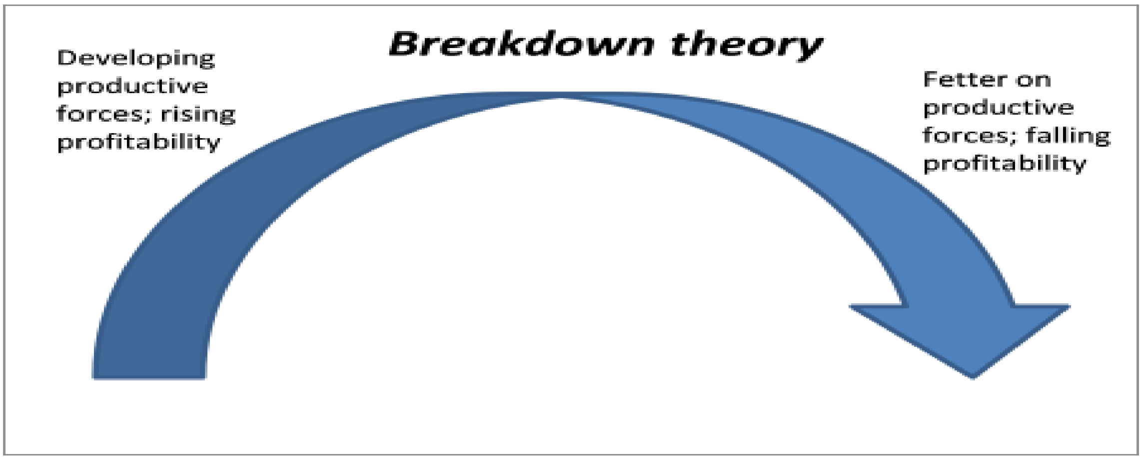
Profit cycles and economic recessions

Is Marx's causal explanation of capitalist crises just that: a theory of recurrent and even regular crises, of booms and slumps in capitalist accumulation? Or is it more than that (or alternatively), a theory of breakdown, namely an explanation of how capitalism cannot continue indefinitely (even if it has regular crises), but must reach its limits as a system of social organisation, then break down and be replaced by a new system?

We can first clarify what we mean by crisis or breakdown by some schematic graphic examples. There is no permanent crisis in the sense of total endogenous breakdown. The Marxist theory of crisis and its laws could be described as showing that capitalism proceeds in cycles of boom and slump like this.



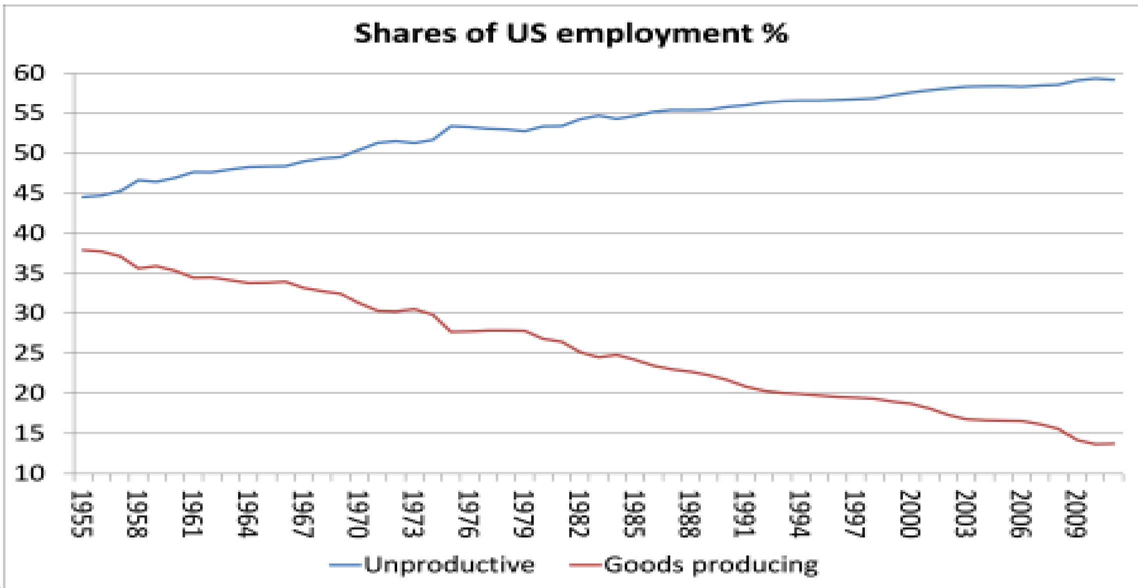
The 'breakdown theory' of capitalist crisis would look more like this graphically.



First, the capitalist economy rises as it is still a progressive system in developing the productive forces, but eventually the contradictions of capitalist accumulation become so great that capitalism becomes a fetter on human progress. It no longer reduces labour time or increases use values sufficiently. Capitalism then heads for breakdown and the final confrontation with the working class. It's socialism or barbarism.

The most well-known proponent of this breakdown interpretation of Marx's theory was Henry Grossman[24] Capital goes into crisis because of lack of sufficient surplus value for accumulation. At a certain point, the drive to accumulate will be blocked by the need to fund workers' living standards and capitalist consumption. Grossman did not think capitalism would collapse 'automatically', without the intervention of human action.[25],

Robert Kurtz argues something like this[26] . Kurz highlights some key indicators in modern capitalism that tells you that it is in its terminal stage. First, there is the growth of unproductive labour. Most labour is increasingly employed in sectors that do not provide surplus value for accumulation, but in circulating existing capital or preserving the capitalist state.



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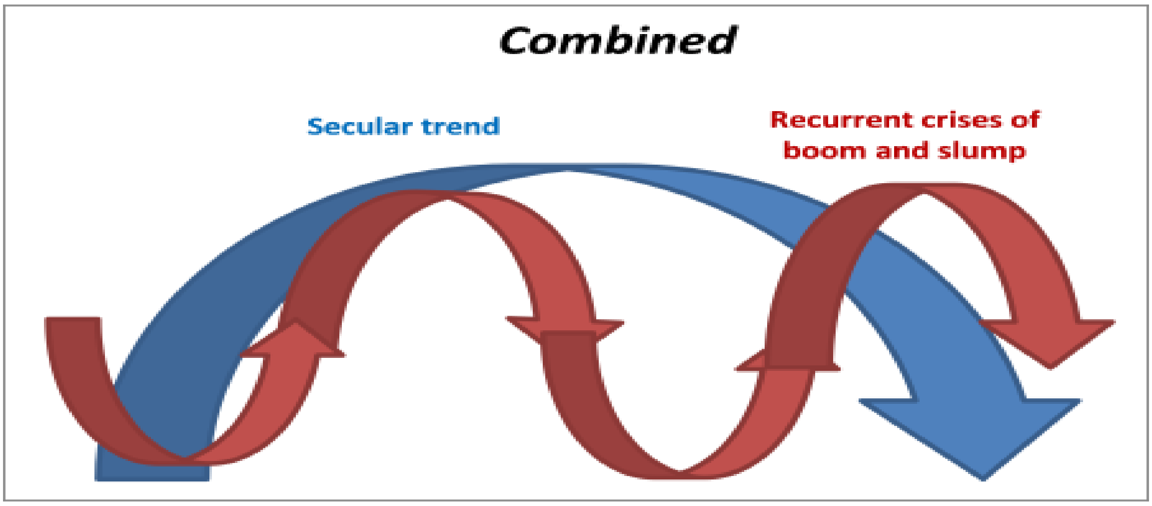
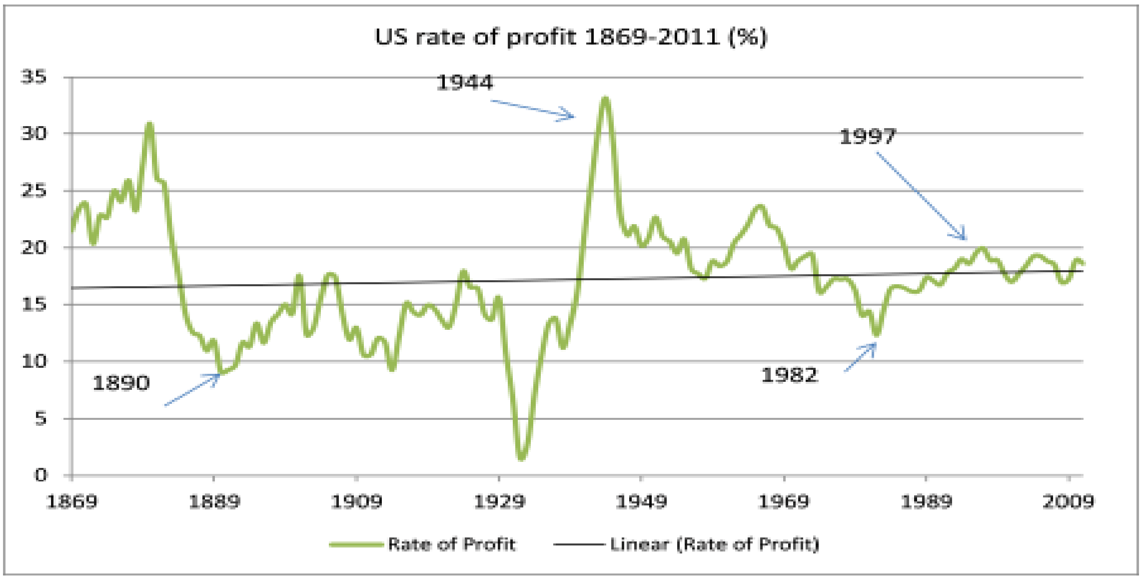
The idea that capitalism can no longer exploit technology successfully is the theme adopted by David Graeber [27] argues that capitalism has failed to deliver on the hopes and promises of technological advance in the last 50 years. Graeber says there are three claims that capitalism makes to justify it as a progressive mode of social organisation: it fosters scientific and technological growth; second, it increases overall prosperity; and third, it creates a more secure and democratic world. But it increasingly fails to deliver on all three: *"we can feel especially confident that none of this will happen within the framework of contemporary capitalism or any form of capitalism"*.

[24] Grossman 1929
[25] As Grossman's disciple, Paul Mattick puts it: *"in principle, in developed capitalism, any great crisis can become the final crisis. But if it does not, it remains a presupposition for further accumulation. But permanent crisis is just as conceivable in the Marxian system as surmountable crises…. under present day conditions of world capital, a state of persistent economic and political crisis can arise as it just as possible that the crisis will give capital a chance of beginning a new expansion"*. (Economic crisis and crisis theory, 1981).
[26] Kurz (1995)
[27] Graeber (2012).

I don't think either a cyclical or breakdown theory of crisis is the full story. I prefer a schema that looks like this and basically combines both the crisis and breakdown model.



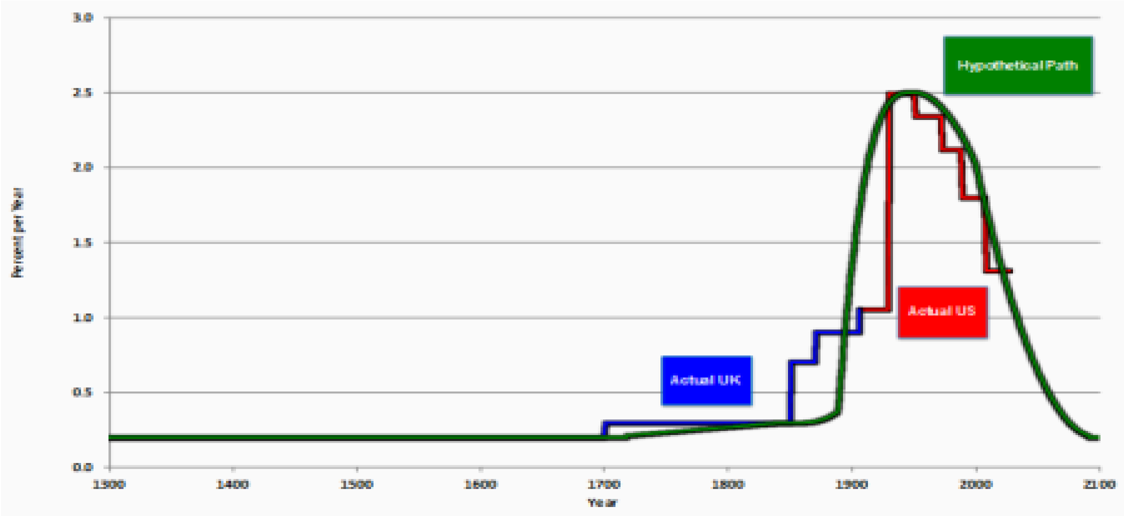
So there are continual recurring crises or cycles that spin round the secular trend for capitalist development that spreads over centuries. The figure below showing the US rate of profit since 1869 suggests that there has been no particular secular decline in the US rate of profit to support the breakdown theory. But we can see a secular decline since the 1960s. So maybe that was when US capitalism entered its 'terminal stage'.



Robert Gordon argues the US is in just such a terminal stage[28]. Gordon suggests that capitalism drove the productive forces (and thus economic growth) upwards from about 1750 to 1950. But now we are in the downward spiral of capitalism that no longer takes the productive forces forward. He exhibits this in a graphic showing UK and US economic growth rates over the period. Capitalism, at least in

[28] RJ Gordon (2012)

the mature economies, has had its day.



But can capitalism get a further kick forward from exploiting the hundreds of millions coming into the labour forces of Asia, South America and the Middle East? This would be a classic way of compensating for the falling rate of profit in the mature capitalist economies[29]. There is still a large reserve army of labour composed of unemployed, underemployed or inactive adults of another 2.3bn people globally that could also be exploited for new value. And even if the mature capitalist economies are in 'down mode' that may not be the case for the world economy.

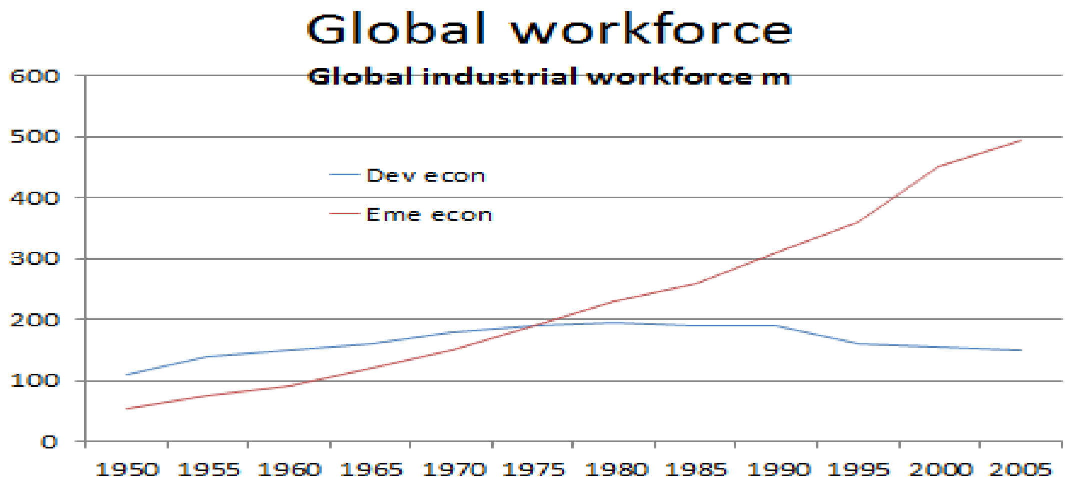
It may be possible for newly expanding capitalist economies to use huge supplies of cheap labour to create surplus value rather than using new technology (or ideally a combination of both, as in China and East Asia). But in more mature (and ageing) economies the supply of cheap labour has run out and capitalists "in the West" can only compete in world markets by either exporting their capital into the emerging economies (imperialism or globalisation) or finding new technologies that raise labour productivity exponentially. 'Globalisation' was the story of the period from the late 1970s to early 2000s as the 'solution' to falling profitability in the major capitalist economies. But a new downturn in profitability in the late 1990s and the recessions of 2001 and the Great Recession of 2008-9 has put that solution in jeopardy.

A new study by McKinsey, the management consultants finds that manufacturing now contributes 20% of global economic output and 37% of global productivity growth since 1995. But because investment in manufacturing is 'capital-biased', it does not create jobs and is designed to avoid raising wages. Indeed, according to McKinsey[30], manufacturing employment fell 24% in the advanced economies between 1995 and 2005. The wider global story is revealed by the rise in the industrial workforce in emerging economies and the fall in

[29] John Smith (2011). While the industrial workforce in the mature capitalist economies has shrunk to under 150m, as unproductive labour has risen sharply; in the so-called emerging economies the industrial workforce now stands at 500m, having surpassed the industrial work force in the imperialist countries by the early 1980s.

[30](*http://www.mckinsey.com/insights/mgi/research/productivity_competitiveness_and_growth/the_future_of_manufacturing*),

advanced economies[31]



In the advanced economies, higher profits can only come from raising the productivity of labour or by a reduction in raw material (energy) costs, rather than lowering or holding wages down through the use of more cheap labour. The shale oil and gas revolution in North America and parts of Europe may help reduce energy costs over the next decade (maybe). But getting overall costs down depends very much on the new technologies.

But that is not to say this potential labour force will ever be properly exploited by the capitalist mode of production. The world rate of profit (not just the rate of profit in the mature G7 economies) stopped rising in the late 1990s and has not recovered to the level of the golden age for capitalism in the 1960s, despite the massive potential global labour force. It seems that the countervailing factors of foreign investment in the emerging world, combined with new technology, have not been sufficient to keep pushing up the world rate of profit, so far[32].

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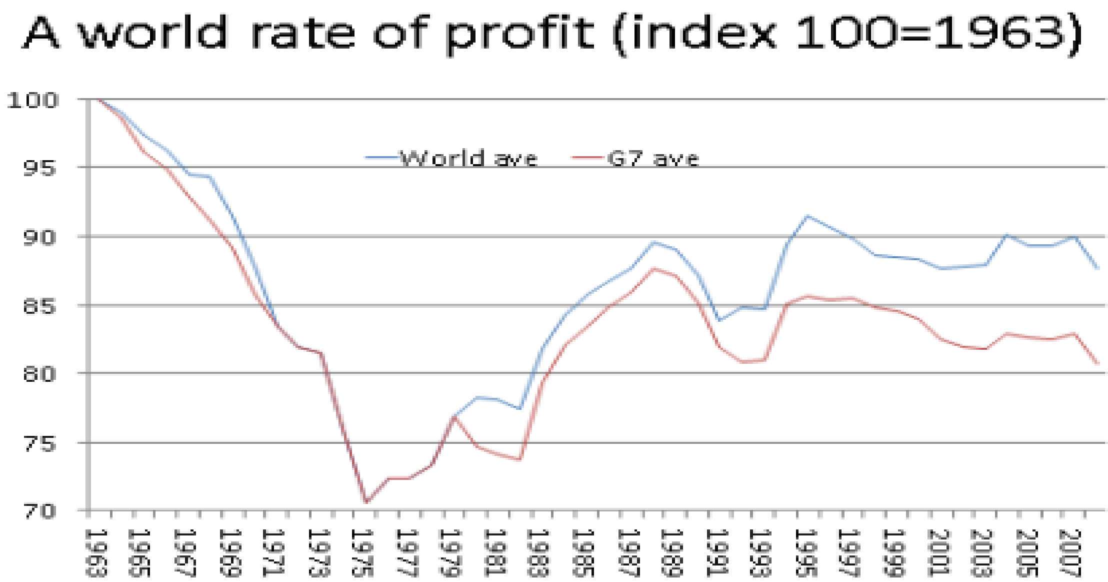
[31] This graph was originally constructed by John Smith in his excellent *Imperialism and the globalisation of production* paper. [Imperialism & the Globalisation of Production]

[32] In his insightful book, (*The rise of China and the demise of the capitalist world economy,* 2008), Minqi Li argues that the mature capitalist economies of the UK and the US have experienced a secular decline in the rate of profit from the 19th century on, confirming Marx's law and suggesting that the 'progressive' nature of capitalist accumulation in these economies is over. He reckons that the global warming crisis and the peaking of energy production will make it impossible for capitalism to avoid collapse or breakdown. Like Gordon, and echoing the views of Immanuel Wallerstein, Li predicts that world economic growth will grind to halt by the 2040s as a result. Capitalism cannot survive beyond that and there must a new system of human social organisation or total chaos. *"Multiple economic, social, geopolitical and ecological forces are now converging towards the final demise of the existing world system, the capitalist world economy. All have reached their advanced phases and this demise will take place in front of the eyes within the lifetime of many readers".* Socialism or ecological disaster is Minqi Li's forecast.



Capitalism will not just collapse of its own accord. Crises are endogenous because of the main contradiction within the capitalist mode of production, of accumulation for profit and not need. But also it is possible for capitalism to recover and soldier on ‘endogenously’ when sufficient old capital is destroyed in value (and sometimes physically) to allow a new period of rising profitability. Capitalism can only be replaced by a new system of social organisation through conscious action of human beings, in particular by the majority class of people (the working class globally). Without such conscious action, capitalism can stumble on or society may eventually fall back into barbarism.

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