

The 25 Year-Old Economic Depression Model and Predictions

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The world economy is in the middle of a depression period that will last the rest of this decade and run perhaps well into the 2020s. This depression period and the others that the world has experienced since the late 1700s were due to an 80 year cycle of paradigm change in physics and technology development. Twenty-five years ago, this author developed an **economic model concerning this relationship between physics paradigm changes and depressions** and described the model and the evidence for it in a book titled: *The Periodic Production of Rationalized Phenomena and the Past Periodic Depressions*. In the early 1990s, I then predicted, based on the model, that there would be a 10 year economic boom starting about the year 2000 in the countries that led in the development of Quantum Mechanics-based technology followed by a financial crisis around 2009 and a long depression period perhaps lasting 12 years. The prediction proved correct. Unprecedented peacetime lending and currency creation has kept the usual depression symptoms at bay, but **conditions will get worse during this decade**. Here's the model, some information about the current economic situation, and predictions.

The Economic Depression Model

In the early and middle 20th century, economists such as Kondratiev and Schumpeter identified a cycle in advanced economies that was known as the long wave or Kondratiev wave. They thought that the cycle lasted about half a century. This assumption was mainly based on the depressions of the 1800s that happened about 50 years apart. But actually, these major depressionary eras tend to happen 40 years apart as I discovered in the late 1980s. **The economic long wave of depressions at about 40 year intervals in advanced societies is due to the technological change that is due to paradigm changes in physics that happened about every 80 years.**

Scientific Revolutions

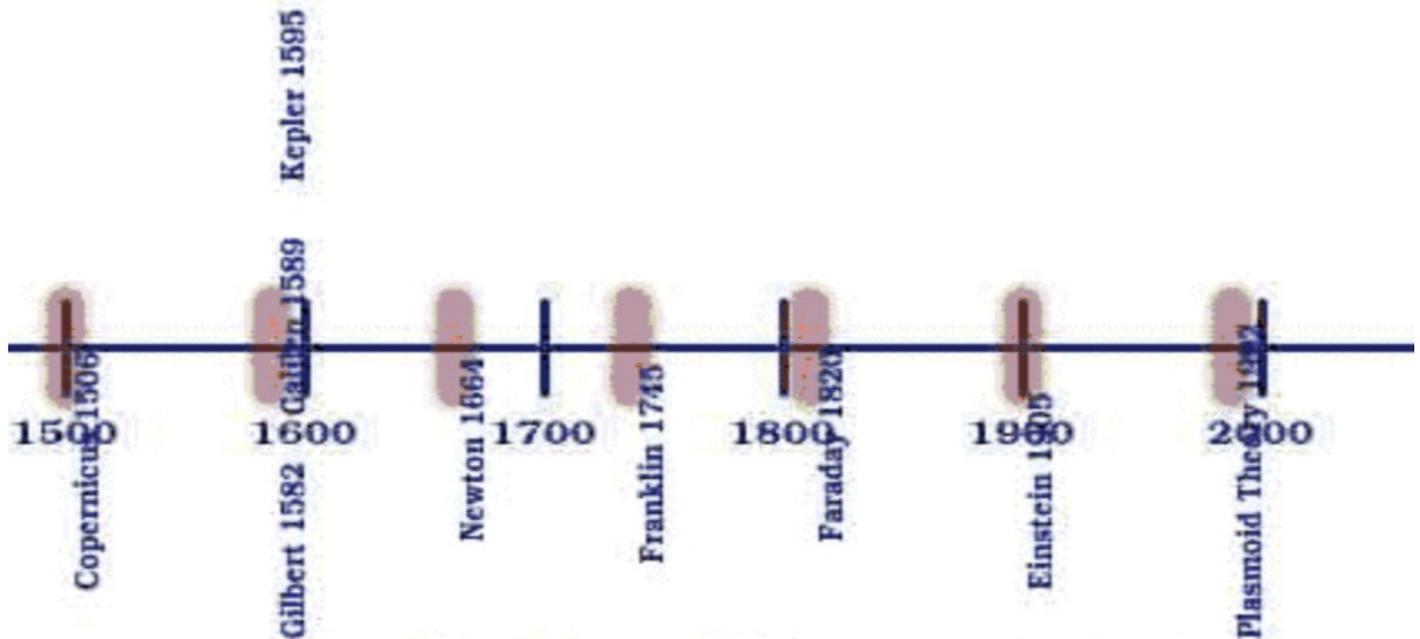


Illustration 1: The scientific revolutions in the field of physics are spaced about 80 years apart. In the 1580s and 1590s, three men individually and more or less independently formulated similar basic theories for the second scientific paradigm. From my study of history, in each paradigm shift except the second, there was only a single paradigm formulator who had a significant role. But in the late 1500s, there were three men who formulated three different though similar theories that were influential. They all learned the same crisis period anomalies directly. Gilbert was the oldest and the first. Both Galileo and Kepler had knowledge of Gilbert's research and book and they corresponded by letter about theory. Details about this history is described in my book.

Thomas Kuhn wrote about how and when these instances of physics paradigm change happened in a classic book called *The Structure of Scientific Revolutions*, but he never described that they happen 80 years apart or that paradigm changes in the field of physics had any regular timing to them. But the regular timing is clear: **historically they have happened from 73 to 87 years apart.** What does it mean that a physics paradigm change happens? It means that large groups of people think about the world differently than earlier generations, and they develop new kinds of technology and products. These products, new technologies, and new industries start to appear about 20 years after the theory of the paradigm is well developed around the time of the "crisis period" at the end of each physics paradigm. Kuhn coined the term "crisis period," and these crisis periods last about 20 years and happened at the times marked in red above in Illustration 1.

I wrote a whole book and many papers about this in the 1990s, and some of these can be found on my site, sciencejunk.org, or published in various places. The economics model is simple and based on the work of Kondratiev, Kuznets, and J. Waters mainly. So if this model interests you, you can read about it online. The book goes into a lot of detail explaining and detailing the history of science from before Copernicus to present times.

Industrial Revolution Depressions

There have been two kinds of depressions since 1780 in the most advanced economies. They are quite different, and they alternate. The two kinds of depressions are the industrial revolution depressions and the technological acceleration depressions. The industrial revolution depressions happen during the industrial revolutions. They more or less coincide with a crisis period in physics and are characterized by low

productivity growth and the emergence of many small companies in major new fields of industry.

First Industrial Revolution: Franklin's Fluid paradigm was developed by Aepinus, Lavoisier, Coulomb and many others in the period from about 1750 to 1785, and it led to the development of industries relatively quickly because his paradigm was accepted and adopted in advanced countries quite rapidly. Young people such as Watt started to make devices based on the conception of fluids of heat, electricity, and magnetism that each had their own unique properties. Watt developed a good steam engine design that was adopted to power many industries during the First Industrial Revolution of the 1790s and early 1800s. So labor productivity growth in Britain started to rise as Britain emerged from the depression era of the 1780s and 1790s.

Second Industrial Revolution: Likewise, Faraday's conception of point atoms and lines of force that extended from them was developed by Maxwell around 1865. Twenty years later, researchers such as Hertz, Tesla and Edison started to invent the technology of the 20th century. There was an industrial revolution in the 1890s and early 20th century. Due to the depletion of the technology potential of the Fluid paradigm and the small size of the nascent Field theory based industries, as well as other factors all stemming from this change of technology, there was a depression period in the US and Great Britain in the 1890s. As the new industries of the Field paradigm grew, productivity growth started to increase in the first decade of the 20th century from its low during that depression period.

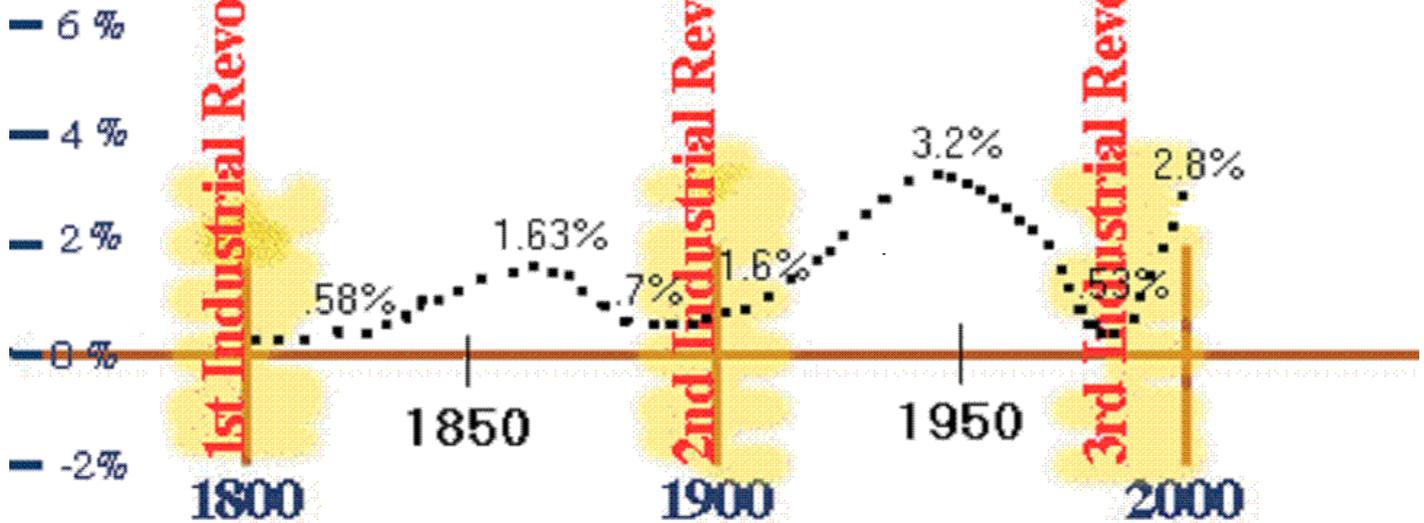
Third Industrial Revolution: Similarly, Einstein's model of 1905 of quanta of energy and space-time change to describe gravity was well developed as two different theories called Quantum Mechanics and General Relativity. These two theories make up the Einstein paradigm, and they were both well developed by about 40 years after 1905 that was when he formulated this paradigm. Again, 20 years after the theory was well developed around 1965, young inventors started to innovate the main products of this technology paradigm such as lasers, computer chips, and PCs. Due to the depletion of the technological potential of the field theory paradigm and the development of the new technologies, there was a depressionary era in the 1970s and 1980s coinciding with the third industrial revolution of those decades. Labor and capital were culled from the matured and dying industries, and they transferred to the new QM based industries that began at that time.

The above is a short explanation for why the industrial revolution depressions were timed as they were in the 1780s-1790s, 1880s-1890s, and 1970s-the early 1980s. **These three industrial revolution depressions were all quite similar.** There were productivity growth dearths and the emergence of revolutionary new fields of industry and technology that supported the rapid growth of many small companies in each field. For more information, read my articles on sciencejunk.org. In my book that was written mostly in the early 1990s, I explain this model in greater detail.

In Illustration 2 below, the labor productivity growth in the US is in a characteristic periodic wave pattern with the slumps during the industrial revolutions. The chart was made about 2001 and shows an S-wave or Gompertz curve pattern.

Technological Revolutions

Industrial Revolutions



caused a periodic trend in United States

per capita GNP and labor productivity statistics

Illustration 2: This chart shows the labor productivity growth trend and the industrial revolutions in the US. The industrial revolutions caused the periodic productivity growth trend, and the industrial revolution depressions happened in the 1780s and 1790s, 1880s and 1890s, and the 1970s and early 1980s. See how around 1830, 1920, and 1999 there was a sudden spurt of productivity growth? It was this technological change that Waters called "technological acceleration" that caused the more severe technological acceleration depressions about 1837, 1930, and 2009.

Graph of Per-Capita GDP and Labor Productivity Growth Rates in US

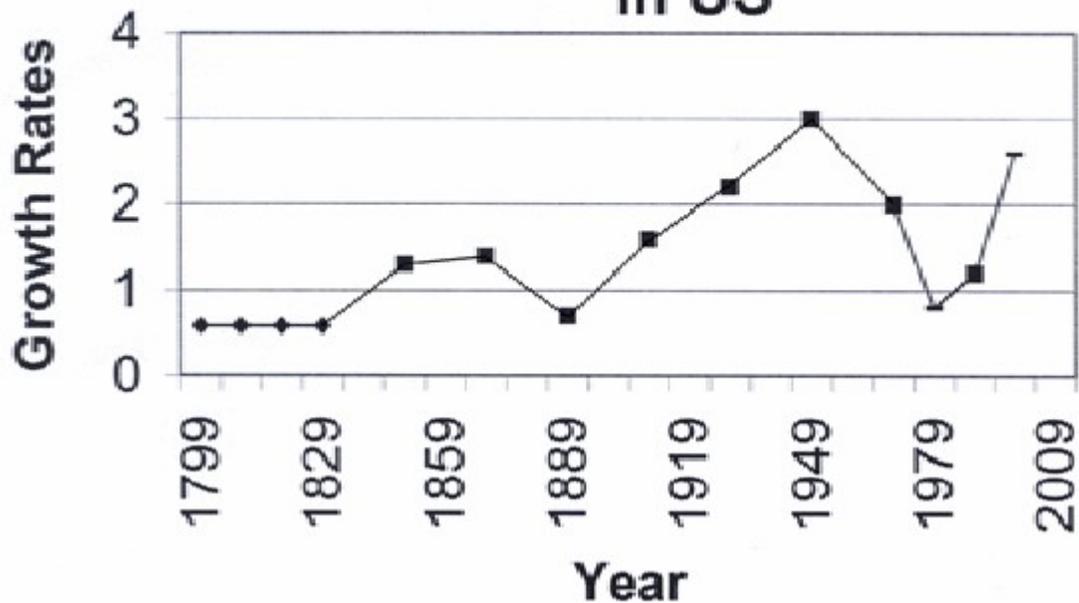


Illustration 3: This chart was made in 2001 or so and includes figures from Romer for 20 year moving averages of labor productivity growth in the US from 1839 to 1989. See how the curve is two similar looking waves that look like S-curves or Gompertz curves? It is this recurring pattern that allows me to make calculations and predictions about future productivity growth rates. The two flat lines at the end show my calculation of labor productivity growth during the industrial revolution depression of the 1970s. The last line blip shows how I was guesstimating the annual productivity growth from 1996-2004. I guessed an average of 2.6% which was almost perfect guess even though the stats for several years were not in yet. You can clearly see the marked productivity growth acceleration around 1830, 1919, and 1999. The diamonds at the beginning mark Romers' calculation of the annual labor productivity growth rates of .58% from 1800 to 1840. In Romer' 20 year moving average calculations, the year 1951 is shown as the peak of growth. I think the early 1950s marks the top of the productivity growth curve. In 1951, productivity growth was about 6% for the year, and it was a record high during the first four or so years of the decade of the 1950s.

Technological Acceleration Depressions

For the last two centuries, after about 20 years after the end of an industrial revolution depression, there has been a sudden doubling of labor productivity growth. Joseph Waters pointed out this acceleration of productivity growth rates in his book *Technological Acceleration and the Great Depression*. When I found this book in 1989, it helped me understand how productivity growth acceleration in the US caused the Great Depression. There was a similar doubling in the 1820s in Great Britain when it was the technology leader of the Fluid paradigm industries.

The doubling of growth happens because people in the industries of a paradigm switch their product innovation from product introduction to process innovation. During an industrial revolution, the generation of young inventors such as Edison focus on designing and introducing new kinds of products. These products are revolutionary, and spur great demand. But 20 years later, the industries standardize so that the people focus on producing the standardized products cheaply and are in competition for market share in markets that become oligopoly markets. **These same characteristic features can be seen in the economies of Great Britain in the 1820s, the US in the 1920s, and the US in the decade of the 2000s when each of these**

economies hit their “boom” phase of development.

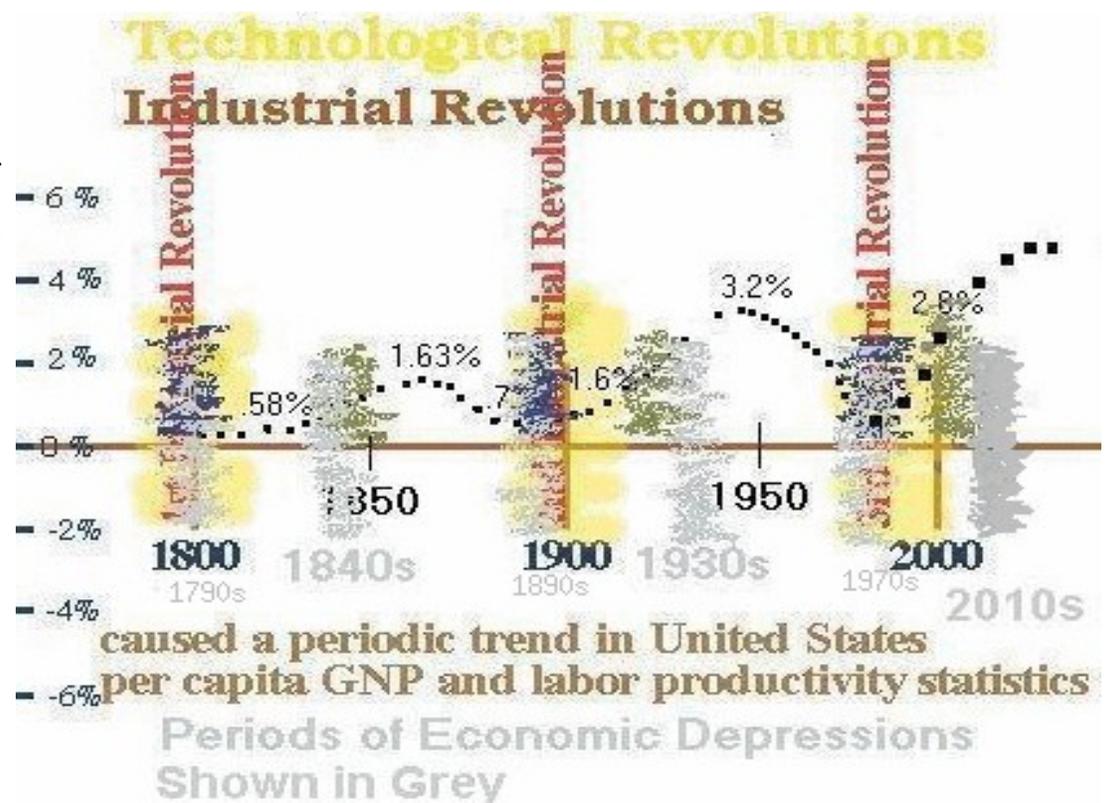
Automation, economies of scale, and capturing the market for a standardized product became the emphasis, and the competition between the many companies in each industry involved price competition and merger and acquisition activity. Through heavy borrowing and offering consumers credit, some companies expanded, automated production to reduce prices, and survived in oligopoly or monopolistic markets while the other companies were absorbed or went bankrupt. We saw this happen during the last decade when oligopolies emerged in the US. The remaining companies unemployed a large part of the workforce through their acquisition and streamlining of production processes.

The switch from product to process innovation is what caused the technological acceleration depressionary periods of the 1830s-1840s, 1930s-early 1940s, and now. So there was a standardization of available products, a lack of new product innovation for revolutionary new products that would allow for new markets, and a great increase in unemployment or disemployment. Since the US was the technological follower of Great Britain, the country entered its depression era about 8 years after Britain did starting from 1837 with a large number of bank closures.

In the early 1800s, the British technological acceleration period happened 10 years earlier than the American because Britain was the technological leader of the First Industrial Revolution era and about 8 or 10 years ahead of the US in industrial development and technology. The British were the leaders in innovation in the fluid paradigm industries, and Americans were behind throughout the years of development of the first paradigm. According to Crafts' statistics, British output per capita grew at a flat rate of about .5 percent annually from the year 1760 to the year 1820. The figures also show that the growth of output in the United Kingdom from the late 18th century to 1820 was a gradual process, but in the 1820s, productivity growth accelerated to about 2 percent annually and stayed at this level until about 1870. Then it slumped to the near zero growth rates characteristic of the end of innovation in the fluid paradigm industries.

In 1989, I realized that the regular timing of depressions of the past of the Kondratiev long wave is due to the 80-year physics paradigm change process causing depressions about every 40 years, and that **there was going to be a depressionary period of the technological acceleration type that would commence about the year 2009** although I wasn't sure my model was accurate enough to pinpoint 2009 as the exact year. But the model did prove very accurate, and the depression era commenced in 2008.

Illustration 4: Chart of the economic depression periods and productivity growth rates in the US extrapolated out to the 2030s. The times of the depression periods are shown in gray. The industrial revolution depressions happened in the 1790s, 1890s, and the 1970s. The technological acceleration



depressions happened in the 1840s, 1930s, and 2010s in the US. The dates for the depression periods are similar for Great Britain, although that country was in an industrial revolution depression in the 1780s extending for two decades, a technological acceleration depression in the 1830s extending into the 1840s, an industrial revolution depression in the 1880s extending for two decades, and their third industrial revolution depressionary period lasted longer in the 1980s than did that of the US that ended in 1983. The **green areas** show the approximate time of the technological acceleration periods when productivity growth suddenly doubled in each of the three eras. The **yellow areas** show the times of technological/industrial revolutions. The **blue areas** (1790s to first years of the 1800s, the 1890s, and the 1970s to early years of the 1980s) show the productivity growth slumps and industrial revolution depression periods.

Past Written Predictions as Evidence for the Model's Accuracy

I've been writing about this depressionary period of the 2010s for 25 years after I developed this model in 1989. The model explains why the economic long wave happens as a result of paradigm changes in physics. That **the economic predictions have matched the economic events for the last 25 years is evidence that this model is accurate.**

In the early 1990s, I wrote:

"Scientific revolutions have happened at about 80 year intervals, and these have caused "technological revolutions" at about 80 year intervals and economic depressionary periods about every 40 years. The periodic depressions have been called Kondratiev depressions." [Introduction to *The Periodic Production of Rationalized Phenomena and the Past Periodic Depressions*, 1996. www.padrak.com/ine/ELEWIS6.html](http://www.padrak.com/ine/ELEWIS6.html)

In the middle of the 1990s, I wrote:

"If the trend of economic development continues as it has for the past 200 years, the peoples who lead in the production of Q.M.-type phenomena will **undergo the first kind of depressionary period about the year 2010 or 2020** unless there will be some type of financial collapse. It is interesting to me that economists such as Dent are also predicting a depressionary period about the years 2010 or 2020 based on generational life-cycle theory." [Introduction to *The Periodic Production of Rationalized Phenomena and the Past Periodic Depressions*, 1996. www.padrak.com/ine/ELEWIS6.html](http://www.padrak.com/ine/ELEWIS6.html)

So 20 years ago, I tried to bucket out in my online introduction to my book the time when this technological revolution depression would happen based on my model. I wasn't totally sure about the 2010 date although I thought this depression would follow along on the 40 year timing, so I included 2020 as a possible late date just in case the 2010 date was too early. As you can see, I was basically predicting that the decade of the 2010s would be the depression period. What I meant about including the phrase "unless there will be some type of financial collapse" is that I was thinking the financial markets could collapse before 2009 since it seemed that a disaster or some other trigger might cause a financial crisis given the record high government debts. Though there were financial crises between 1996 and 2008, none was severe enough to start a depression. By this time, in 1996, I had read Dent's book and his economic predictions based on demographics, and I was surprised that such a different model predicted the same time for this current depression period.

I tried to publish the book and my articles during the 1990s. But almost no one believed me. People who believed in economic long waves in the 1990s mostly predicted that a depression would occur in the 1990s based on their assumption that these Kondratiev wave depressions happen every 50 or 60 years and that the last such depression was the 1930s Great Depression. These people didn't believe that the 1970s global great recession was actually a Kondratiev long wave slump, and they didn't believe that there are two alternating

types of depressions as I tried to explain to them.

In 1998, I was blogging on early long-wave discussion forums and telling people that an economic boom was about to start that would be similar to the 1920s boom period with its doubling of productivity growth rates. Though few people believed or agreed with what I was saying since most of the long wave bloggers and K-wave writers were thinking that the US was in a long wave depression era then in the 1990s. Quite in contradiction, I was predicting that a ten year economic boom was starting. I wanted to get this prediction up on the 1996 web page cited above, so I asked that a note be attached to the original 1996 page. I did not alter the 1996 part of the page, but only attached the note to the top of it to keep it as a record of my 1996 predictions. As shown in a this note attached in May 28, 1998 to the the 1996 web article cited above, I wrote:

"According to the theory, barring unforeseen disasters, even more rapid industrial development and higher growth rates are predicted for the future. **Specifically, during the next 10 years the most advanced economies will experience economic development in many ways similar to the period from 1917-1929 in the U.S., a time when the U.S. economy boomed and entire industries were developed.** That was a time of great social change." [Note appended online in 1998 to my online article: Introduction to *The Periodic Production of Rationalized Phenomena and the Past Periodic Depressions*, 1996. www.padrak.com/ine/ELEWIS6.html](http://www.padrak.com/ine/ELEWIS6.html)

This prediction about the period 1999-2009 was actually made earlier than 1998. It proved exactly accurate to the year. No one I knew about except Harry Dent was writing the same prediction. It shows that I thought that the year 2009 might mark the start of the depression. I knew from the record of the technological acceleration eras of the 1820s and 1920s that these technological acceleration periods had ten year booms followed by a financial crash and a long depression era lasting about 13 years or so.

By 2003, it was clear to me that the technological acceleration had started just as I predicted it would about the year 1999, and it was clear that the US was in a boom period with high borrowing just as I predicted. It was also clear to me that this scientific change-economic model was proving accurate enough that I should warn people that a new major depression period was about to start about 2009.

I calculated the date 2009 from the pattern of the 1920s and 1820s. The productivity growth doubling happened in 1919, and the depression started with a financial crash 10 years later in 1929. So I thought that a financial crash and a depression would start about 2009 or 10 years after the productivity growth doubling of 1999.

I tried to warn people about this imminent depression and financial crash, and after several attempts of sending to journals and business magazines, I eventually published a letter in a small paper circulating science magazine called *Infinite Energy* where I had previously published physics articles. I wanted to warn the people in my field and whoever else would read it. I titled this letter: "**Economic Depression or Deep Recession Coming Soon.**"

Here are quotes from the 2007 published letter:

"If any of these predictions hadn't **turned out to be so accurate** it would have disproved this theory. **But since these predictions from 1990 have proved so accurate, it seemed proper to warn people of a possible depression or deep recession in the near future.** Even if the idea of an 80

year periodicity of revolutions seems untrue to you, if these trends continue of rising productivity due to the displacement of labor by automation, oligopoly and efficiencies of scale, increasing business and consumer debt, and the satiation of consumer demand of the available types of products within the constraints of their budgets, **what will the outcome be but a general decrease of consumption demand?"** “Economic Depression or Deep Recession Coming Soon,” published about ½ a year later in May, 2008. tc38.metawerx.com.au/oldsite/LewisLetter79.pdf

In the middle of the decade of the 2000s, merger and acquisition activity had reached a new high in the US, and I saw other data that reminded me of the 1920s such as the record high consumer and corporate debt. It was clear that products were standardizing and that the major quantum mechanics based industries were becoming oligopoly markets and were rapidly automating. In late 2007, I thought that unemployment would soon quickly spike up due to the merger and acquisitions and the rapid automation of production that was strikingly similar to what happened in 1929.

Quoting this letter to the editor that I wrote in late 2007, I also said:

"In 2007, the stock market reached record highs. Americans are also working record hours per week and the unemployment rate this decade has been lower than any decade since the 1960s. Many American states have record low unemployment. Since August 1982, when it bottomed at 776, the Dow has risen almost 1,700%. That ascent reflects an economy that has nearly tripled from \$5.2 trillion in 1982, adjusted for inflation, to \$13.9 trillion today. Extremely high debt levels were predicted for the lead economy. This is evident. As happened in the late 1920s, the U.S. has record business and private debt as businesses struggle to survive as oligopolies formed in each industry and the survivors tried to gain market share. In 2005 and 2006 a record was set for mergers and acquisitions in the U.S. economy. Mergers and acquisitions are at the highest level since the Great Depression."

The letter continues:

"Total corporate debt that has financed the **corporate drive for market share and for corporate survival** is the highest since the Great Depression. Total American consumer debt reached \$2.2 trillion in 2005, up from \$1 trillion in 1994. And, 2005 was a record year for personal bankruptcies." "Economic Depression or Deep Recession Coming Soon," May, 2008. tc38.metawerx.com.au/oldsite/LewisLetter79.pdf

This letter was sent to *Infinite Energy* in December of 2007, and it was eventually published in May of 2008. It is a good record that I was **warning people about the imminent K-wave depression period** and that this depression would be like the 1920s depression. I explained the causes of the imminent depression and what the depression would be like. I also explained the main financial and technological factors that would cause the depression or deep recession. As I described 25 years ago, these factors are **all due to the transitioning of the QM based industries from emphasizing product innovation to emphasizing process innovation**. Process innovation causes unemployment because people pursue production at lower cost through automation and methods of mass production and unemploy human labor. I couldn't get my economic warning articles or letters published in other journals or magazines though I tried to submit my articles and letters to a handful of publications over a period of about a year.

At the time I wrote this letter in the fall of 2007, I looked online for people who were predicting that a financial crisis and depression era would soon occur, and other than Dent who I already knew about from the 1990s, I only found about two or three other writers saying the same thing. However, in the last few years, I've learned of several more people who were publishing the same prediction back in 2007, so it brings the total of accurate predictors to about 8 individuals out of the thousands of economists and business writers.

From what I can tell, the difference of my predictions from the others, other than Dent, is that I was **making my predictions based on a very fundamental economic model**. Others were simply making predictions based on their assessment of the statistics around 2007. But **my predictions dated from 1990**. In my papers, I explained the 80-year physics paradigm change model and other details of this model that most people still don't believe. I described in more detail about what characterizes both types of depressions, and in my longer articles, I try to include more historical data concerning each of the 6 major Kondratiev wave dips since the late 1700s. To understand more about this model, you can read my papers online. It is a simple theory explaining the cause of scientific revolutions, and the economic model simply follows.

The Current Economic Situation

Since 2008, the Central Bank has been doing some amazing monetary actions and **the government has kept expanding and providing jobs, food, and money to people. The Central Bank, the big banks, and the government has been following a money production and spending program that is different than the behavior of the US government and the banks in the first half of the Great Depression**. So most Americans have not suffered as much as the people did in the 1930s so far. However, it is clear that this **really is a depressionary decade**.

Record Unemployment

Though official unemployment numbers have declined, the unemployment and disemployment are still at record levels as of 2014. People are working less hours, and their income and quality of work has decreased since 2007.

5.9% U3

11.8% U6

23.1 *Shadowstats* estimate in early fall, 2014

Table 1: Early fall, 2014, unemployment numbers.

So far, the **unemployment during this depression is similar or a little worse than the 1970s-1983 deep recession** and about a half of that of the Great Depression. In 1994, the government started to quote the U3 rate as the labor unemployment rate. It replaced a statistical number that is more similar to the current U6. It undercounts because it doesn't count people who haven't interviewed for a job in four weeks, and **a part-time job is counted as a full time job**. When a person with a full time job gets a part-time job, this side job is counted as job in the statistics of new jobs added to the economy. Much of the new jobs growth is simply part-time and temp work.

Four out of five of the new jobs are considered low or minimum wage jobs. Most of these jobs fall into categories such as retail, hospitality, health, and temporary employment. I think that these new service jobs are a result of the booming stock market and cash creation. This gives the wealthy and some other people extra money for luxuries such as restaurant meals, vacations, vacation houses and other luxuries. So there is an increase in the number of service workers and laborers such as waiters, resort staff, hotel staff, people building vacation houses, and medical and health service workers. Much of this low paying work is done for the wealthy and elderly.

This stock bubble and the **new part time jobs, temp jobs, and low paying service jobs** are similar to what happened at the end of the 1920s economic boom when there was a surging stock market. But these things are happening during a long wave depression era. It is said that the derivatives and stock speculation has reached record levels by the fall of 2014 that even exceed that of the time just before 2008.

92 million people are officially counted as not in the labor force in the US. **This is the lowest labor force participation rate in 36 years.** The largest part of the jobs added in the early fall of this year were given to people in the 55-69 age bracket. As in Europe, there is very high unemployment and low labor participation for people in their 20s and younger.

Government Deficits and Official Money Expansion

The official Central Bank money creation program is unprecedented for peace time. The big banks' derivatives program is also unprecedented. There have also been **unprecedented federal deficits, and there is a correlation between deficits each year and the officially recognized money expansion each year.**

The 10 years of the decade of the 1930s, 1930-1939	The 5 war years of World War II, 1941 - 1945	10 years during the third industrial revolution depression era (deep recession), 1973-1983	6 years of this technological acceleration depression, 2009 - 2014	During the next 7 years during the second dip, how much of GDP might be required to maintain this process? 2015-2022
3.8% of GDP	19% of GDP	5% of GDP	7.1% of GDP	?

Table 2: Comparison of deficit spending during the past crises. Remember that much GDP statistics are actually due to the money/debt creation.

So as shown in Table 2 above, deficit spending is **now about twice the level in terms of GDP as during the Great Depression**. What would have happened if the deficit spending had been less and more similar to the 1930s' level? Probably, this depression decade would have been much worse in terms of what the average person feels about it. It would have seemed more like a great depression.

There is a **rough equivalence between Central Bank QE and the deficit in this depression era**. See Table 3 below:

Year	Deficit Spending and Percent of GDP	QE
2009	1.4T 10%	QE1 1.75T
2010	1.3T 10.5%	QE2 .6T
2011	1.3T 8.5%	Twist .4T
2012	1.1T 7%	QE3 1T
2013	.68T 4.1%	QE3 1T
2014	.5T 2.8%	QE3 .5T
6 years	= 6.28T 7.15% of GDP	= 4.25T

Table 3: You can see that year by year and total, there is a rough equivalence between QE and annual deficits. 6.28T for total deficit spending and 4.25T for total QE. QE3 is supposed to end this fall of 2014.

Up until October 2014, these are the official statistics. *Shadowstats* and others say the deficit spending is actually much higher. The official deficits seem to stay in line with the QE numbers.

The unprecedented central bank spending and derivatives keep many banks operating. There are also unprecedented federal deficits. So thus far, the economic crisis doesn't seem so severe to most people as did the middle of the Great Depression seem to the average person then. Thus far, though unemployment is at record highs matching or surpassing that of the 1970s long wave dip, it hasn't reached the levels of the Great Depression. It is clear that **the number of unemployed and bankrupt consumers is reduced by money creation** by both governments and banks.

Predictions According to this Model

This model that was developed 25 years ago predicted a depression period for the 2010s lasting perhaps into the 2020s that would be due to the availability of important new kinds of products, the standardization of these products, and the cessation of the introduction of important new categories of products as has been

usual for the period about 30 years after an industrial revolution. This model predicts that this depression era will be prolonged until at least about 2022 (because the technological acceleration depressions lasted about 13 years). During this depression era, the merger and acquisitions and associated unemployment will continue and there probably will be a lot more personal and corporate bankruptcies. Then the **productivity growth will continue to rise to a peak around 2032 and then decrease as the QM industries mature and experience innovation stagnation.** The 2032 date is arrived at by adding 50 years to 1982. There was about a 50 year interval between the end of an industrial revolution depression and the time of the highest productivity growth in the two prior industrial eras in Britain (when it was paradigm leader) in the middle 1800s and in the US (when it was paradigm leader) in the middle 1900s.

This model predicted that this depression era would be due to the unusually heavy consumer and corporate debt loads that would accrue by the end of the decade of the 2000s and the economic consequences of the switch from product innovation to process innovation that would enable a productivity growth spurt starting about the year 2000. These economic consequences of the standardization of products and the cessation of new product innovation included the rise of oligopolies and monopolies; oligopoly price competition for standardized products through their usual labor layoffs, mergers and acquisitions; the automation of production; and a great rise in personal and corporate bankruptcies associated with a financial crisis similar to that of the late 1820s in Britain and the late 1920s in the US.

More Dips during this Depression

The period of the 1930s had three depression dips that seem to have been associated with the regular business cycle of recessions every 4 to 7 years. **This depression era will also have at least one more dip that people will call “the double dip,”** and there will probably be more afterwards. It is during these times that disemployment and corporate and consumer bankruptcies will occur most heavily during this decade and the next matching what happened in the US in the 1930s and early 1940s.

Exogenous Factors

This model doesn't take into account exogenous factors such as major natural disasters, wars, or government or bank policies. These things can't be foreseen in a theoretical way based on this theory of scientific paradigm change, but since the economic development of Britain during and after the First Industrial Revolution and the economic development of the US during and after the Second Industrial Revolution were so similar, in the late 1980s that was just after the Third Industrial Revolution, I thought I could identify the main economic factors arising from science and technology paradigm change and so described this model.

The governments of the US and the other most advanced industrialized countries and the central banks and the big banks of these countries have followed a monetary and spending course that is unprecedented by Britain and America during the two scientific-industrial paradigms from 1800 to 1980. I believe that these policies are factors exogenous to this model. This depression period would have happened even with better government and banking policies because this depression is due mainly to the standardization of products, the associated oligopoly and monopoly industrial markets, and the investment and marketing strategies of the main players. These are the characteristics of paradigmatic industries at this stage of development. Perhaps the unprecedented government spending and currency and derivative spending has so far kept the people from experiencing the bankruptcies of banks on the scale of the 1930s and the more severe visible poverty of the early to middle 1930s.

I think the great increase of government debt, derivative creation, and bank currency making is ominous and can't really produce any good result for most Americans. But I can't predict what will happen because of this by only basing my predictions on what is in this model since this model doesn't consider this exogenous

factor. I am wondering, though the model doesn't predict this, whether the depression will last longer than those of Britain and the US during the 1830s-1840s and the US during the 1930s-1940s due to the government and bank policy of the last 20 years to fund the government by deficits and pile on debt on top of debt. This model can't address this question because it deals with the characteristic economic effects of periodic scientific and technological innovation.

The Depression Will Grow Worse between the years 2015 and early 2020

In general, I think that **this depression will grow worse for the average American, and there will be rising rates of unemployment and an increase of poverty during the next seven years.** But as happened in the 1930s, I think a small segment of the population who control the oligopolies, banks and the government, might grow wealthier in terms of ownership and control of the land, the resources, and the productive power. Since the government and banking policies are so different than those of the technological acceleration depression eras of the 1830s, 1840s, and 1930s, I can't suppose what the next 15 years will hold for sure. But I'm describing what the model itself predicts.

In the last two technological eras, the most technologically advanced economies emerged from their technological acceleration depression eras within 15 years or so after the depression started. The model would predict that this will happen again. Other than what I've predicted here, I don't know what else to predict based on this model since I don't know what will happen about war around the world, natural disasters, and government and bank policies. At best, the government and bank actions have only delayed the worse features of this depression for some years. At worst, the economic catastrophe will be extremely severe and more severe than the 1930s depression.

Booming Labor Productivity Growth Rates in the Lead Technological Country Predicted from Now to 2045

Because there is much potential for process innovation in the current QM industries for significantly increasing the automation of production and economies of scale. Whichever country or regional economy that has the technological leadership will enjoy **booming labor productivity growth rates probably approaching 4 percent per year growth by 2026.** I get this number by extrapolating on the productivity growth behavior in this quantum mechanics paradigm since its start compared to the prior two paradigms. The year 2026 is arrived at by adding 43 years to the date the economy emerged from the the deep recession in 1983.

The labor productivity growth rates will peak about 4.2 percent (averaged annually over a period about 6 years) about the year 2036. The year 2036 is arrived at by adding 53 years to the date the economy emerged from the the deep recession in 1983. This 53 year figure matches the labor productivity peak in Britain that happened about 53 years after it emerged from industrial revolution depression in 1800; likewise, it matches the experience of the US that had its productivity growth peak about 53 years after it emerged from the 1890s depression in 1900. Computerization and robotic technology clearly has the potential for great labor saving gains in both the service and manufacturing industries.

The 4.2% figure for labor productivity growth is arrived at by adding 60% to the average annual US labor productivity growth rates of about 2.6% about the year 2000. It is remarkable that there is a 60% increase of labor productivity over the first two industrial paradigms from the years of productivity growth acceleration in the US (1830 and 1920) to the years of peak productivity growth in the US (1863 and 1953). The model implies, by adding 60% of the 2.6% labor productivity growth in the US about the year 2000, that the productivity growth may reach 4.2% annually at the peak. According to the stats, the US

recorded a 2.5% annual labor productivity growth rate (non-farm) from 1995 to 2007.

As I explained in a paper edited in February 2008 that I wrote in 2006 that is cited below called “The Productivity Growth Pattern and Economic Depressions in the American Economy,” (tc38.metawerx.com.au/oldsite/proj/2008paper.pdf) the labor productivity growth acceleration, the doubling of productivity growth associated with the technological acceleration phase of paradigmatic industries, started about 1830 in the US, a little later than that in Britain, because the US was a technological follower of Britain. Correspondingly, the wave of growth due to innovation and application of fluid paradigm technologies lasted about ten years longer in the US than in Britain, until about 1890. See the paper cited below.

As shown by Romer, US per- capita GDP grew about .58 percent from 1800 to 1840. See Illustration 3 above. I am not aware of labor productivity growth statistics for this early period. According to Romer, the average annual growth rate for the productivity of American laborers during the twenty-year period from 1839 to 1859 was 1.3%. From 1859 to 1879, it increased about 1.4% per year. From 1879 to 1899 it increased about .7% per year, decreasing to near zero during the decade of the 1890s. So it can be inferred that labor productivity growth must have doubled in the decade of the 1830s, or else the 1.3% growth of the the 1839 to 1859 period would not be understandable or explainable after the .58% per-capita growth in the decades before. There must have been a labor productivity growth acceleration of about double.

Productivity Growth Slump in the QM Based Industries Will Set In in the 2050s

Then, as in the Fluid and Field paradigm industrial eras, the labor productivity growth rates will slump down rapidly matching the S-wave curve in the charts above. During both of the industrial revolution depressions of the 1890s and the 1990s, the rate of growth in the US decreased to about .5%. So this model would expect about the same thing to happen around $1983+75 \text{ years} = 2058$ based on the assumption that a new industrial revolution will be happen about $70 + 1983$ or 2053. If there is no replacement paradigm or innovation in industries of the new paradigm by about 2047, then labor productivity growth rates will drop to zero. Physics improves through paradigm change. If there is no paradigm change or at least the development of industries of the new set, there can't be technological innovation after the end of this era of QM based industry. The new small industries and companies leading the first two industrial revolutions were the ones that caused the productivity growth of both industrial revolution depression eras.

How the leading economy will have full employment after this current depression era isn't clear to me since most of the usual production can be handled by robots and computers. The new 3D production technology will stimulate growth and innovation, but will it help the lead economy reach what has been considered to be full employment? The model predicts that there will be full employment and robust growth after this current depressionary period in whatever country or economy leads in technology since that was the experience of Britain in the middle 1800s and the US in the middle 1900s.

A Replacement Scientific and Industrial Paradigm Current by the 2050s?

In other articles on my site and published in conference proceedings, I explain the details of the physics paradigm change model that underlies this economic model. It still remains to be seen whether another physics paradigm will replace quantum mechanics. I wrote much about this much in other articles. If another physics paradigm doesn't develop or at least some products of the new paradigm are not introduced, then industrial innovation will come to a halt at the time of decline of the quantum mechanics based industries

after 2040; and there won't be technology of another paradigm to replace it.

As I explain in other articles, there is work being done towards developing a theory of plasmoid phenomena, and there is still a lot of experimental research in this area. I explain my model for the plasmoid paradigm and detail what anomalies of the 1970s to 1990s crisis period my plasmoid theory is based on.

In my other articles published on my site and in conference proceedings, I also explained how people working according to a dominant obsolescent scientific paradigm can still innovate products of a newer set as did the European inventors who believed in Fluid theory in the middle 1800s when Field theory was being developed. These inventors were able to invent important revolutionary electromagnetic products such as the telegraph though their actual working physics theory was about fluids and was obsolescent and similar to that of Franklin and Coulomb. So maybe new energy and material manufacturing technology will be introduced by people who believe in quantum mechanics from the Plasmoid paradigm set that is the set of phenomena that was discovered in the last crisis period. It will be as if they stumble on inventions by mistake and trial and error because they don't have an actual theory of plasmoids. Their QM based models might be elegant, but these models will never be as accurate or comprehensive as a plasmoid paradigm theory. Unless you are familiar with the field, this might be hard for you to understand.

Summary

Economics has never had a paradigm model, but dogma is preached instead. I'm trying to show that this model for economic depressions could serve as a fundamental theory for economics. It produces accurate predictions as has now been verified after 25 years. The model I use has remained unchanged for 25 years. For a paradigmatic theory in a field to be valid, it must have testable predictions. This theory's predictions, tested by time, is proving accurate.

As I said, this economic model rests on a simple model of scientific paradigm change in the field of physics that is described in much more detail in my book and articles online. That model explains why paradigm change in physics has had a regular periodicity of 80 years. This economic model is based on that model of paradigm change. But explaining that model here would lengthen this article, and I wanted to keep it focused on economic issues and predictions.

In the first two sections of this paper, I tried to give an overview of this economic model, and I quoted some predictions that were written in articles between the early 1990s and 2007 before this current depression period started in the fall of 2008. Some of my past articles available online goes into much greater depth about this economic model. The accurate fulfillment of predictions for the last 25 years helps to verify this theory's validity.

Then in the third section of this paper about predictions according to this model, I described some more predictions about what will happen in the next fifty years and described how this depression might play out according to this model: I wrote that labor productivity growth in the leading economy (not necessarily the US) will continue to increase until a peak about the years 2030 and 2035 and then decrease to the characteristic low marking the end (or full maturation) of the quantum mechanics based industries around 2050. I wrote about the 60% annual productivity growth in the US over the first two industrial paradigms, and wrote that the model implies, based on the 2.7% labor productivity growth in the US about the year 2000, that the productivity growth may reach 4.5% at the peak.

By including quoted predictions from old articles (actual paragraphs or parts of paragraphs), I showed that the model predicted that the industrial revolution that was underway in QM based industries would bring about a doubling of productivity growth by about 2000, an economic boom like the 1920s boom in the first decade of the 2000s, and **a long wave technological acceleration depression like the Great Depression starting with a financial crash about 2009 and extending for at least 12 years. These predictions were proved correct.**

Because government and central bank policies are so different than in the prior two technological depression eras of the 1830s and 1840s and 1930s and 1940s, the outcome might prove to be very different than in the past. But **the model itself doesn't address this question.** In the past, the leading economies of Great Britain and the US weathered their depressions and reemerged in a period of prosperity. Great Britain did so without any major wars in the 1840s, and the US also emerged from its depression era in the 1840s without major wars. The main part of America's 1830s-1840s depression was over by 1843. Funding the Mexican American War may have contributed some production stimulus in the middle of the 1840s, but it was a relatively minor war compared to the size of the country's economy then.

The US emerged from WWII with clear economic dominance, and the high level of federal deficit spending of about 19% of GDP during the war years seemed to contribute to ending the depression era. But based on the record of both Great Britain and the US in the similar depression era of the 1830s when they recovered without major war, I think the US economy might have recovered in the 1940s even if there was no war.

In both the US by the 1940s and Great Britain by the 1840s, every industry was clearly monopolized or oligopolized by the end of their depressions. Productivity growth was very high during those decades which helped spur a second boom in the economies of both countries in their respective season of world dominance. During this decade, even tighter oligopolies will form in each industry than we have experienced thus far, but it seems to me that the result of the current policies will be to deindustrialize the US and straddle the country with such huge debts that it could grow weaker, so economic and technological leadership may pass to other countries. On the other hand, other major technologically advanced competitors such as Japan or Germany also have record high levels of bank money creation and government debt and many other problems, so maybe the US will continue as a technology leader.

In general, expect that **this depression era will turn more severe in the next few years** for the average American and European although the economic leaders may gain great power and wealth in the world. I'm guessing that the recent government and bank behavior may make this depression extend out for more years past the 13 or so years that seem to be regular for these kinds of depressions that occur during technological acceleration eras, but the model itself doesn't predict that. I've noticed in the last 25 years that my conjectures about economic predictions based on assumptions and ideas other than this model have proved much less accurate than the model's predictions.

Citations

This work is based on research I read in the late 1980s and early 1990s. Read through the February 2008 paper cited below (tc38.metawerx.com.au/oldsite/proj/2008jpaper.pdf) for a lot more statistical information and explanations of this model. In that paper also that I had started writing in 2006 to try to warn people of this coming depression era, I wrote that a depression would start within a few years.

The theory for depressionary periods during times of industrial maturation was originally based partly on Waters' ideas, along with the ideas of Kondratiev, Schumpeter, Christopher Freeman, Robert Ayres and other

more recent writers such as those who contributed articles to *Long Waves in the World Economy* that I found in 1989 that was edited by Christopher Freeman. Later writers, except Rick Szostak, have not cited Waters' work as far as I know. This seems odd to me.

R. U. Ayres, *The Next Industrial Revolution: Reviving Industry Through Innovation*, Cambridge, Massachusetts, 1984.

N. Crafts, *British Economic Growth During the Industrial Revolution*, New York, Oxford University Press, 1985.

Ester Fano, "Technical Progress as a Destabilizing Factor and as an Agent of Recovery in the United States between the Two World Wars," *History and Technology*, 3, no. 3, 263 (1987).

Ester Fano's papers well substantiated this theory and Water's ideas. Fano's papers describe and document the increasing unemployment in the U.S. during the 1920s and 1930s due to increasing automation and innovations in automated mass production. Fano did not cite Waters.

Hobsbawm, *Industry and Empire*, New York, 1968, 1969. p. 69.

Edward Lewis, "The Periodic Production of Rationalized Phenomena and the Past Periodic Depressions," 1990 manuscript. It has been revised and updated several times and is available on sciencejunk.org.

"Introduction to *The Periodic Production of Rationalized Phenomena and the Past Periodic Depressions*," 1996. www.padrak.com/ine/ELEWIS6.html"

"Economic Depression or Deep Recession Coming Soon," May, 2008. tc38.metawerx.com.au/oldsite/LewisLetter79.pdf

"The Productivity Growth Pattern and Economic Depressions in the American Economy, November, 2006 and revised February 11, 2008. tc38.metawerx.com.au/oldsite/proj/2008jpaper.pdf

Data from *Statistical Abstracts of the U.S.* as compiled by Phil Hyde on www.timesharing.com.

Joseph Paul Waters, *Technological Acceleration and the Great Depression*, New York, Arno Press, 1972, 1977.

Most of the reasoning for depressions during the middle of technological periods in this paper was adduced from Waters' explanation for the specific case of the 1930s U.S. depression. His book contained explanations for the depression that were previously suggested by long wave theorists such as Schumpeter. Waters' theory is applicable to a general pattern of technological progress. Two causal factors of my theory were not discussed in his book: the effect of automation on employment during the maturing phase of industrial development as expounded in the life-cycle of industry theory and the effect of satisfaction of consumer demand for types of products.

Editorial Note:

On Dec. 27, a version of this paper was uploaded on The Most Important News site on Dec. 28, 2014. It replaced a version that was put up about two weeks earlier. In this January 17 version, I lengthed it and made it more descriptive, made format changes, included more statistics, and included some citations.