Entropy Economics from the Great Crash to the Strait of Hormuz and the AI Revolution
Levy Institute Economics Conference
May 8, 2026
James K. Galbraith

It is an odd fact that nearly 100 years after the Great Crash of 1929 and the ensuing Great Depression, it is still possible to doubt that a satisfactory explanation of these events has been arrived at.

John Maynard Keynes, writing from England in 1930, placed the blame on the decline of demand, due to a collapse of capital goods investment, owing to a collapse of profit expectations, as prices fell faster than costs. Keynes was an astute observer and (as I shall argue) he was not wrong. But while his logic and his sequence are clear, he described these movements in very broad, abstract terms and the precise trigger, if there was one, does not emerge clearly.

My father, writing at the Baker Library at Dartmouth in 1954, argued that the crash was endemic to the preceding boom in the stock market. As for the Depression – it was not the main topic of his book – he gave only a cursory survey of five interlinked causes: a bad income distribution, a bad corporate structure (meaning too much leverage), a bad banking structure (meaning no deposit insurance), a "dubious foreign balance" (meaning vulnerability to debt default), and the "poor state of economic intelligence," meaning the pre-Keynesian commitment to balanced budgets.

Milton Friedman and Anna Schwartz, writing in the early 1960s, blamed the Federal Reserve for not preventing the collapse of the money supply, and by extension the collapse of the money supply for the Depression. This interesting argument disconnected the crash from the Depression, and supposed (without establishing) that the power to prevent a crash of the money supply rested with the Federal Reserve in the first place. But it flowed from Friedman and Schwartz's prior belief in the natural stability of the private economy, and therefore by construction the responsibility of government for any failures that might have occurred.

Charles Kindleberger, writing in 1973, stressed the weakness of the *international* monetary system, in the process of transition away from the hegemony of sterling but not yet arrived at the hegemony of the dollar. Peter Temin, writing in 1976, sought to critique Friedman and Schwartz, by then the dominant view among academic economists. Temin followed Keynes in stressing demand, but with the modification that he rooted the drop in demand in a shift of consumption function, ostensibly exogenous and not itself easily explained.

Jude Wanniski, writing in the mid-1970s, blamed the Smoot-Hawley tariff, an argument with a bit of support from my father, who noted that the tariffs helped precipitate Peruvian debt defaults, which helped undermine confidence in the banks that had made those loans. But this was not Wanniski's mechanism; for him the essential offense was the sacrilege against free markets and free trade.

Ben Bernanke, writing in 1983, blamed a rise in "uncertainty," and this argument was largely recapitulated by Christina Romer in 1988. Their argument linked the Depression to the Crash, while leaving the crash unexplained, as either an exogenous shock or something endemic to the financial markets. Bernanke focused on investment spending, while Romer added the dimension of consumer durables purchases. She writes that "the stock market crash *caused* consumers and producers to become uncertain about the course of future income." (emphasis added).

Meanwhile, for acolytes of the “real business cycle,” there is nothing to explain. Cycles happen, thanks to the ebb and flow of technologies. The doctrine specifies that “total factor productivity” fell, and the rest followed. No specific asset or specific technology appears to be associated with this idea. What cannot be avoided or improved upon, need not be studied or understood in detail. For as Robert Lucas remarked in 1994, “What technological or psychological events could have induced such behavior in a large, diversified economy? How could such events have gone unremarked at the time, and remain invisible in hindsight?”

I need not comment on some of the more recent work, dating to the 2000s, that blames the Depression on the New Deal, and specifically on the price-fixing efforts of the National Industrial Recovery Act. This work conveniently places responsibility for events in 1929, 1930, and 1931 on policies enacted in 1933, a true feat of rational foresight.

In short, what a mess! It seems we have a better view of the extinction of the dinosaurs, the fall of Rome and the collapse of the Maya than our economists have given us of the defining economic events of the last century. The above list is not entirely wrong. It includes proximate causes, contributing factors, spurious correlations, and also empty, irrefutable assertions based on plausible unobservables, such as Larry Summers' 1986 remark that “What happened was a failure of the exchange mechanism.” What there isn't, is a clear-cut precipitating event, that might explain both the why the stock market crashed when it did and why capital investment collapsed, why the banks collapsed, and why demand and finally production also collapsed.

I think Chris Kennedy has the answer and it is no detraction from the enormous credit he is due for his work in this area – of which he will make only a short summary today – to say that it's astonishing that no one has developed this thesis before. For the clues are abundant, in the industrial history of the 19th century (notably Walt Rostow), in the writings of institutional economists (notably John R. Commons and Thurman Arnold), in the financial histories and in scars on the North American landscape, visible to this day. As Chris notes, there are even some clues in forensic work on wages done some years ago by myself and Tom Ferguson. But in general, the clues are not to be found in an economic literature that chose to detach itself from the physical world, to make no concessions to the second law of thermodynamics, and to couch itself in models operating on national income accounting categories (consumption, investment, government) or, even worse, entirely abstract variables (capital, labor, output) embedded in models of timeless equilibrium.

Joseph Schumpeter wrote in a footnote somewhere, that you may string together as many carriages as you please, you will not get a railway thereby. This gets to the heart of the issue – technological change is not smooth or continuous. It typically involves two types of change: a change in the source of energy, from horse to coal and steam in this example, and a change of infrastructure, from dirt road to steel rail. The first must be assured, over a long future, or the second will not occur. And the second takes time, before the full transformation can be realized.

Entropy economics specifies in simple terms the dynamics of both preconditions. The value of a commodity, such as coal or oil, depends on its relative scarcity, easily expressed in logarithmic form:

$$V = -\log_b(P)$$

where P is a measure of scarcity expressed as a probability, and b, the base of the logarithm, is the number of suppliers, expressing a degree of monopoly power. A new and scarce commodity has high economic value. As competition increases and a commodity diffuses, economic value tends to decline.

Meanwhile the expected profitability of an investment in infrastructure (or fixed capital generally) depends on the discount rate, the project duration, the expected value of variable costs, and the degree of uncertainty associated with the investment, including the degree of expected competition. The discovery of a new low-entropy resource is good news. But it will translate into falling expected profitability for activities that (a) do not use this resource, and (b) will be competing, eventually, with activities that do. Meanwhile uncertainties associated with the demands for new infrastructure and the time required to build it may slow the adoption and expansion of the new alternative.

What were the great American economic activities before the New Deal? Agriculture was by far the greatest, largely powered by horses, for the food of which roughly one-third of American farmland was dedicated, if I remember correctly a statistic mentioned only once in my education, by Wassily Leontief around 1971. As for industries, the largest was the railroads. I'll defer that story.

What then was the New Deal? Under the leadership of Jesse Jones, a Texas oil man (emphasis implied) at the helm of the Reconstruction Finance Corporation, a massive program of public investment in new infrastructure: roads, airfields, new ships burning oil, new rolling stock burning diesel, along with hydropower and electrification (see Fenberg, 2011). When my father immigrated from Canada in 1930, via ferry from Port Talbot to Cleveland, he bought a Model T and drove out to Berkeley, noting that from Lincoln, Nebraska to the California line there were no paved roads. By the end of the 1930s the infrastructure was in place, and the uncertainties over technological direction had been resolved.

Let me skip to the present so as not to step on the story my co-panelist will tell, and ask how, in light of this argument, we might interpret current events. Notwithstanding that many would wish otherwise, so far as I can see the age of oil has not ended. We are witnessing a titanic struggle over the control of oil. But the precise nature of that struggle is obscure, and the day-to-day details are clouded by the extreme inconsistency of American policy statements, as well as the complicating factor of Israeli influence over American decisions.

Still, if one looks past those factors at the underlying economics, it may be that one can discern a logic, which would potentially explain some of the major pressures on American policy. Let us recall, first, that in the pandemic the price of oil properties in the Permian Basin fell dramatically, and that private equity took a strong position while prices were low, placing the production decisions in the hands of entities concerned primarily with money and only peripherally with energy or economic stability. Sustained profitability, in turn, requires a price of crude oil high enough to cover costs, but not so high as to generate a global recession. Let's say that price is roughly between $70 and $90 a barrel.

Let's further note that in the weeks before February 28, the price of oil was just above break-even, at around $65/barrel. President Trump took note of low and falling gas prices in his State of the Union; a speech for the broad public. No inference about the deep preferences of the White House – especially not this White House – should be drawn from a public speech. The well count in the Permian had been falling since 2023, from 360 to 242 by February, 2026, and production had peaked in 2025.

The Iran War took about half of Persian Gulf production off the market. Some oil from Iran continued to flow. Some, if I read news reports correctly, also from Iraq. Some from Saudi Arabia could be diverted to the Red Sea. Kuwait and the Gulf countries with no alternative outlets were stuck.

Using the value function presented above, and treating global oil production as having a high degree of abundance (0.8) and five major producing regions (North America, Iran/Iraq, the rest of the Gulf,

Russia, and all the rest), I calculated the price effect of taking one region and ten percent off the market. The answer was an increase of 60 percent, which was, within a percentage point or two, exactly what happened in the first month of the war. The parameters are pure approximation but the result lends some confidence to the line of reasoning. The resulting price was just above the sweet zone yielding sustainable profits to private equity controlling American oil production.

In this light, the ensuing US naval blockade of Iranian ports, along with Iran's control of the Strait of Hormuz, may be seen as a struggle over *who* exactly in the Persian Gulf gets to participate in the global oil trade at a level sufficiently reduced to keep prices high enough for US interests. There is obvious reluctance to unleash full destruction of energy supply from the Gulf: the resulting price would be around $155/bbl by my simple-minded calculation, which would crush the global economy. And while a world Depression would then cut the price, that sequence following would be unpredictable and there is no guarantee of a floor at profitable levels.

The actual future is uncertain; I do not venture a prediction. My only assessment, as of mid-April, is that a dance is ongoing, whose *desired* outcome from the standpoint of the financial interests behind American oil is to *reduce but not eliminate* the flow from the Gulf, and secondarily to *allocate* that flow between Iran and the other producers so as to forestall the collapse of the latter. Cutting out Iran alone is not a viable option, since Iran would take down the entire Gulf (and destroy Israel into the bargain) if its energy infrastructure is destroyed.

Iran on the other hand would prefer to maintain Gulf production, including its own, exercising its power to collect a toll on the passage through the Strait. For Iran, a low-cost producer, the price is a secondary matter, especially insofar as low prices, for a time, will erode the productive competition from the Permian Basin. Thus the continuing tension between the two powers. Iran here has a strong hand, since it controls the exit from the Gulf. But if no *modus vivendi* can be arrived at, it remains possible that renewed fighting will take the entire Persian Gulf offline.

In all this, there is no fundamental energy transition. There is presently nothing in view, on the energy front, that approximates the coal-oil transition of the 1930s. And there is none in prospect, barring great expansion at low cost of thorium-uranium or other reactor technologies, yet unproven and certainly not baked into market expectations. The limitations of solar, industrial wind, and other once-rising and heavily promoted technologies are now reasonably apparent. A world depression not preceded by new technological possibilities will not, as some imagine, generate massive new investments in any forms of energy. Indeed without a depression the growth in these sectors is outpaced by energy demands, so that the great twentieth century household amenity of electrification is becoming increasingly hard to afford.

What we do see, quite clearly, is an ongoing technological transformation that *uses* energy on a vast scale, and that is artificial intelligence and its associated data centers. For what does AI substitute? The answer, of course, is real intelligence, of the kind cultivated in human brains and matured in costly institutions of secondary and (especially) higher education. Faced with low-cost competition, notwithstanding its low quality, the economic value of real intelligence is in steep decline. The consequences, which are also unfolding all around us, will be seen in the depreciation of higher education, the closing of ever-more colleges and universities, and the eventual (indeed, already ongoing) decline in human reproduction rates.

But as I'm speaking to an audience of college professors and students, as well as of householders, not to mention parents and prospective parents, this is not anything you don't already know.

**
James K. Galbraith is Senior Scholar at the Levy Institute, a professor at The University of Texas at Austin, co-author of *Entropy Economics: The Living Basis of Value and Production,* and author of the forthcoming *The Power to Destroy: How Bad Economics Drove American Decline.*

References

Arnold, Thurman, *The Folklore of Capitalism,* Beard Books, 2000 [1937].

Bernanke, Ben, "Irreversibility, Uncertainty, and Cyclical Investment." *Quarterly Journal of Economics* 98 (February 1983): 85-106.

DeVroey, Michel and Luca Pensieroso, "Real Business Cycle Theory and the Great Depression: The Abandonment of the Abstentionist Viewpoint" ECON Discussion Papers ; 2005/42 (2005) http://hdl.handle.net/2078.1/5735

Fenberg, Stephen, *Unprecedented Power: Jesse Jones, Capitalism and the Common Good*, College Station, Texas A&M Press, 2011.

Ferguson, Thomas and James K. Galbraith, "The American Wage Structure, 1920-1946," *Research in Economic History,* Vol. 19, 205-257, 1999.

Friedman, Milton and Anna Schwartz, *A Monetary History of the United States, 1867 – 1960.* Princeton: Princeton University Press, 1963.

Galbraith, James K. and Jing Chen, *Entropy Economics: The Living Basis of Value and Production,* Chicago, 2025.

Galbraith, John Kenneth, *The Great Crash, 1929,* Cambridge: Houghton Mifflin, 1955.

Kennedy, Chris, "How an Energy Transition Underlay the Great Depression," Levy Institute Conference Draft, April 10, 2026.

Keynes, John Maynard, "The Slump of 1930," in *Essays in Persuasion,* London: MacMillan,1933.

Kindleberger, Charles, *The World in Depression, 1929-1939,* University of California Press, 1973

Lucas, Robert, "Review of Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1867-1960"* in *Journal of Monetary Economics,* Vol. 34, 5-16. Quoted in De Vroey and Pensieroso, *supra.*

Romer, Christina, "The Great Crash and the Onset of the Great Depression," Cambridge: NBER Working Paper 2639, 1988.

Rostow, Walt W. *The Process of Economic Growth,* New York, 1962, 302-303.

Schumpeter, Joseph A. *Theory of Economic Development,* Routledge, 1980 [1911].

Summers, Lawrence, "Some Skeptical Observations on the Real Business Cycle Theory", *Federal*

Reserve Bank of Minneapolis Quarterly Review, vol. 10, pg. 23–27. Cited in De Vroey and Pensieroso, *supra.*

Temin, Peter, *Did Monetary Forces Cause the Great Depression?* New York: Norton, 1976*supra.*

Wanniski, Jude, *The Way the World Works,* Regnery, 1978.