

# What Is a Hyperinflationary Shock Wave?

*Jonathan Tennenbaum explains how the “upward collapse” of today’s hyperinflation is like a sonic boom.*

In late September, Lyndon LaRouche put out an urgent warning to the international community, on the danger of an impending, hyperinflationary explosion of the world financial system, similar in many ways to the hyperinflation crisis which devastated Weimar Germany in the second half of 1923, but on a much greater scale. Then, as now, the outbreak of hyperinflation took the form of a *sudden change*, analogous to what physicists call a “shock wave,” which transformed what had appeared up to that moment as a merely gradual loss of value of the currency, into a totally uncontrollable, self-accelerating process. The immediate trigger for that change now, LaRouche emphasized, is the recent speculative activity of hedge funds and related financial interests in the area of oil, gas, and other basic commodities, which has caused an unprecedented explosion of prices on world markets.

Shortly thereafter, LaRouche requested that his collaborators work out a pedagogical diagram to illustrate the notion of a “hyperinflationary shock wave” for a general audience. A first approximation was published on the cover of *EIR* on Sept. 30 (**Figure 1**). It shows a supersonic airplane flying over a landscape, and trailing behind it is a conical pattern of shock waves, of the sort that, when they reach the ground, are heard as “sonic booms.” The diagram indicates, in metaphorical fashion, how the hyperinflationary process, unleashed by the hedge fund speculation at the “nose” of the plane, propagates successively via an explosion of oil and certain other raw material prices, into a generalized increase in commodity prices, and from there into the economy as a whole.

This article is intended to help the reader grasp the full, intended significance of the diagram, and to go into more depth concerning the nature of the hyperinflationary danger, and its connection to the phenomenon of shock waves in physics.

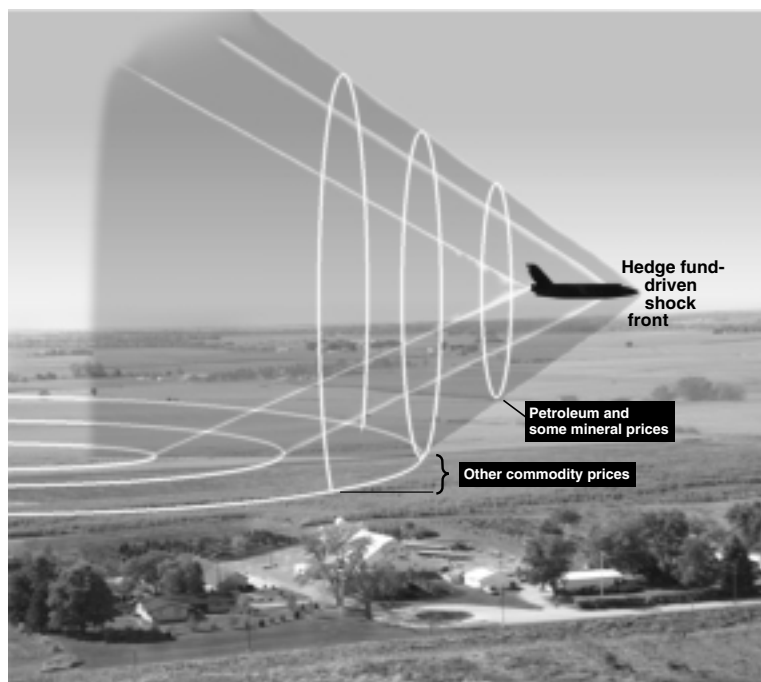
## Where the Danger of Hyperinflation Comes From

The potential threat of a hyperinflationary “blowout” of the world financial system has ex-

isted since at least Summer 2000, when the rate of artificial money-creation in the system, based on U.S. Federal Reserve Chairman Alan Greenspan’s promotion of so-called derivatives and related speculative financial instruments, accelerated to levels far beyond those of the accumulated values of normal financial assets such as stocks and bonds. LaRouche called attention to that event by publishing a revised form of his famous “triple curve” of 1995.

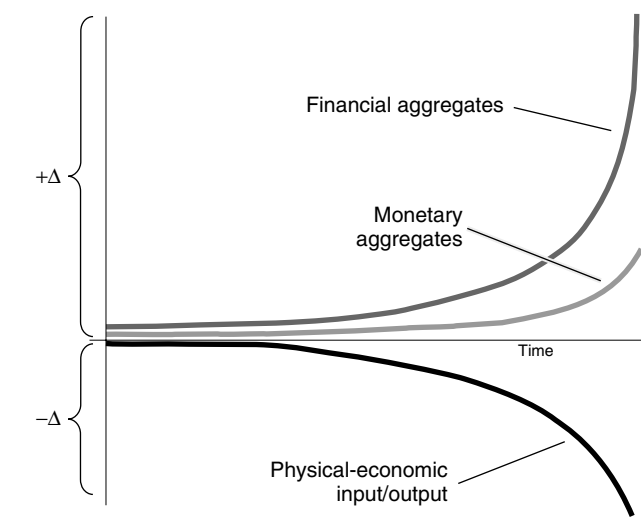
In the original version (**Figure 2a**), the accelerating shrinkage of the real, net physical output of the economy—reflected, for example, in the growing backlog of investments in basic infrastructure and new industrial capacity—was

FIGURE 1



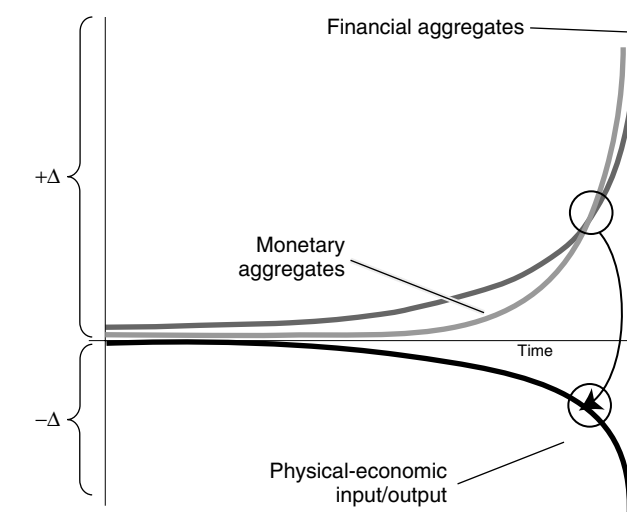
Today’s hyperinflation, driven by the hedge-fund crisis, is comparable to a sonic boom moving across the landscape. At the tip of the cone, where the shock front forms, is the speculative bubble in hedge funds and related derivatives, orders of magnitude larger in monetary value than the physical economy. The commodity price inflation, led by petroleum and certain minerals, is dragged along in the opening conical tail, while prices of other commodities and consumer goods are diffused as they spread out in the conical opening.

FIGURE 2a

**LaRouche's Typical Collapse Function**

*In the original version of LaRouche's Triple Curve, the real net physical output of the economy is shrinking at an accelerating rate, while paper wealth shows hyperbolic growth.*

FIGURE 2b

**The Collapse Reaches a Critical Point Of Instability**

*LaRouche's new version of the Triple Curve shows the same disastrous pattern, but here the "artificial money" has overtaken the growth of financial asset values.*

contrasted with the "hyperbolic" growth of "paper wealth," such as stocks, bonds, and other debt, on the financial markets. Between the two extremes was the curve describing the expansion of money supply, which was also accelerating as a result of central bankers' efforts to support the bubble of financial assets through so-called "liquidity pumping."

However, increasingly into the late-1990s, and particularly following the collapse of the hedge fund LTCM and the "Asian financial crisis" of 1998, as the financial bubble began to falter, the relative efficiency of the Federal Reserve liquidity-pumping operation began to decrease: Relatively more "artificial money" and related debt had to be created, per dollar of financial asset value, to keep the system afloat. With the collapse of the "New Economy" stock bubble in 2000, Greenspan opened the floodgates for generation of a new wave of derivatives-based "funny money," eventually reducing U.S. interest rates to a historic low, in order to create a new, monstrous bubble centered on an inflation of real estate market prices. In June 2000, LaRouche warned that the conditions for a hyperinflationary blowout had been created.

LaRouche's new version of his "triple curve" (Figure 2b) showed the same, disastrous divergence between the real, physical economy and the financial system as before; now, however, the accelerating rate of generation of "artificial money" in various forms had overtaken the growth of financial asset values. The same period was marked by an ominous jump in prices of oil and a number of other basic

commodities, pointing to the possibility of a hyperinflationary breakout at that time.

For various reasons, however, the inflationary process was temporarily contained, owing in part to the acceleration of the globalization process, and the flooding of U.S. and world markets with cheap exports from China and other low-wage areas; to Greenspan's "successful" orchestration of the real estate bubble in the United States and elsewhere, to the blackmail-like impact of Bush-Cheney's imperial war drive, and the agreement of Asians and others to support the dollar by huge purchases of U.S. Treasury bonds and other dollar assets.

**The 'Phase Change' of March-May 1923**

Before returning to today's situation, in which the hedge-fund-driven explosion of oil and other raw material prices is acting to detonate the "hyperinflation bomb," let us briefly look back at the situation in Weimar Germany, just before that "bomb" went off.

In a 2000 *EIR* special report, "Hyperinflation und Weltfinanzkrise" (Hyperinflation and the World Financial Crisis), Lothar Komp examines a series of events that set the stage for the hyperinflationary shock wave that broke out in mid-1923: First, of course, there was the huge accumulation of war debts on all sides at the end of World War I, representing financial claims against a devastated physical economy. Then came the Versailles Treaty of 1919, with its crushing reparations demands; the London ultimatum of May 1921; the debt

crisis of Summer 1922; and the occupation of the Ruhr in January 1923. In the meantime, a turning-point had come when the German Reichsbank, in a desperate effort to counteract the effects of a sudden flow of foreign capital out of the country starting in Spring 1922, decided to provide *huge amounts of additional credit*, at extremely low interest rates, to banks and large companies threatened with bankruptcy. Does this remind one of Greenspan's "liquidity pumping" policy?

As Lothar Komp tells us: After the withdrawal of foreign investments, "the German banking system would very soon have collapsed in a wave of bankruptcies, had the Reichsbank not intervened as the creditor of last resort, turning up the money-printing press for that purpose. The substance of the bailout, was that the Reichsbank now began, in parallel with its short-term refinancing of the state debt, to rediscount bills of exchange of private companies in comparable volume and this, indeed, at *de facto* interest rates, that amounted to more of a gift, than a normal credit. . . ."

Up through the first months of 1923, the inflation in Germany, while significant, remained essentially under control. But, Komp continues:

"Under the influence of the above-mentioned, externally caused events, a phase change occurred in Germany, marking the transition from inflation to hyperinflation. During the inflationary phase, it was the money-printing agency that determined the rate of loss of the value of the currency; once hyperinflation began, the Central Bank became a mere slave of a process, over which it no longer exercised any control whatsoever."

The transition in question was closely connected with a sudden acceleration in the rate of inflation, beyond the rate at which the economy of Germany could adjust, without calling forth a vicious circle of further inflation. Komp gives an important example:

"The domestic producers were forced to take account, in the determination of their sales prices, not only of the momentary, actual costs of production, but also the expected short-term rate of inflation. Otherwise, by the time the next production cycle came around, they would no longer be able to afford the cost of raw materials.

"Propagating into the economy via the cycles of production and consumption, and through wage costs, these higher prices, demanded by the producers for goods sold *today*, on the basis of their expectation of *future inflation* in the costs of supplies they require *tomorrow*, become, in turn, the most efficient driver for a further *acceleration of price increases*, and for a rapidly growing *demand for money* in various forms. Provided that additional money is supplied by the central bank, the self-amplifying inflationary spiral of inflation becomes virtually unstoppable."

In Weimar Germany, an essential trigger for this "phase change" in the behavior of producers and the population as

a whole, in the direction of self-acceleration of price increases, was the sudden increase in import prices for raw materials, associated with a collapse of the Reichsmark relative to the dollar, and the loss of cheap supplies from the Ruhr region.

## Panic Spreading

The highly leveraged character of today's financial markets, the much greater dependency of production upon credit instruments of various sorts—plus, above all, the impact of Alan Greenspan's insane "derivatives bubble" as a mechanism for flooding the economy with additional money—combine to make the danger of a hyperinflationary blowout in the world economy even worse today, than it was in Weimar at the beginning of 1923.

This is one reason that central bankers and others are expressing increasing panic at the recent jump in inflation—exemplified by a nearly 2% rise in producer prices in the United States just for the single month of September—declaring that they will "do everything" to prevent the price increases from spreading into the economy as a whole.

But, once the fact of accelerating inflation becomes recognized, it immediately affects the vast array of *credit instruments*, whose profitability depends on the difference between effective interest rates, and the rate of inflation. In the ensuing race to stay ahead of inflation, increasing interest charges, placed on credit to producers and consumers, become an additional, major contributing factor accelerating the inflation even further.

The original trigger for the price increases in oil, gas, and other commodities, in fact, is the desperate attempt by hedge funds to offset losses in the "gambling casino" of the financial markets, by speculative gains on those commodities. But the rise in basic commodity prices—and particularly fuels—is exactly the most effective way to spread a wave of inflation into the entire economy.

Now, add to this the role of the derivatives markets as a "Doomsday Machine" for flooding the economy with "artificial money" at exactly the worst time.

## Greenspan's Derivatives Bubble: An 'Upward Collapse'

When most people think about a financial crisis, they usually have a deflationary crisis in mind, like a stock market panic, in which the prices of financial assets suddenly collapse to a fraction of their former market values. The case of Weimar 1923 demonstrates, however, that a financial crisis can just as well explode *upward*, in the form of a hyperinflationary blowout in which prices skyrocket, while the value of money shrinks rapidly to nearly zero.

In the case of Weimar Germany, as Komp emphasizes, the central bank "turned into a mere cog in the wheel of the hyperinflationary processes." Today, the situation is poten-

tially far worse, thanks to the far greater “leverage” of the financial markets—that is, the ratio of nominal financial assets effectively controlled by a given player, to the player’s actual capital, and above all, to the advent of the largely unregulated market in derivatives contracts, whose outstanding value amounts to more than five times the total combined Gross National Product of all the world’s nations!

With the help of derivatives, Greenspan and his cronies have created a mechanism which automatically responds to each threatened event of *instability or collapse* of financial asset values, by injecting a much larger amount of “artificial money” into the financial markets. The key to this mechanism is the de facto monetization of derivatives contracts, which are used by companies and speculators as a kind of insurance policy to “hedge” their bets against various sorts of losses. The more unstable the financial system, the greater the volume of derivatives contracts. By assigning a “value” to those contracts, which are then traded as a new sort of “virtual commodity” on the world’s markets, Greenspan and his friends have created a mechanism of “artificial money” expansion beyond the wildest fantasies of bankers and financial speculators of past times.

The *paradoxical* result of this mechanism, is that an ongoing, actual collapse of financial asset values of the conventional type, takes on the *outward appearance* of an *unprecedented boom* in the nominal turnover of hedge funds and banks involved in the trade in derivatives and related financial instruments! The more the economy collapses, the more “money” is to be made in the derivatives markets—at least, for those who have not yet been wiped out.

The analogy would be to a mad mathematician who, having jumped out of a window, constantly changes the units he uses to measure his distance to the ground: from meters, to centimeters, to micrometers, and so on. In this way, the *numbers*, expressing the remaining distance to the ground, seem to constantly increase! Paying attention only to the numbers, and not to the rapidly shrinking dimensions of the *physical units* upon which the measurement is based, the mathematician seriously believes he is actually *soaring upward*. This is the true magic of the markets!

As seen through the glazed eyes of today’s “independent” central bankers, there would seem to be no limits to the success of Greenspan’s ingenious derivatives strategy. Only *physical reality*—the rapidly approaching ground below—stands in its way! But even before hitting the ground of a total physical collapse, the interaction between the real economy and the insanely over-extended financial superstructure is already creating a gigantic “shock front,” which, unless defused by a New Bretton Woods financial reorganization, will soon wipe the entire dollar-based financial system off the face of the Earth.

## What Is a Shock Wave ?

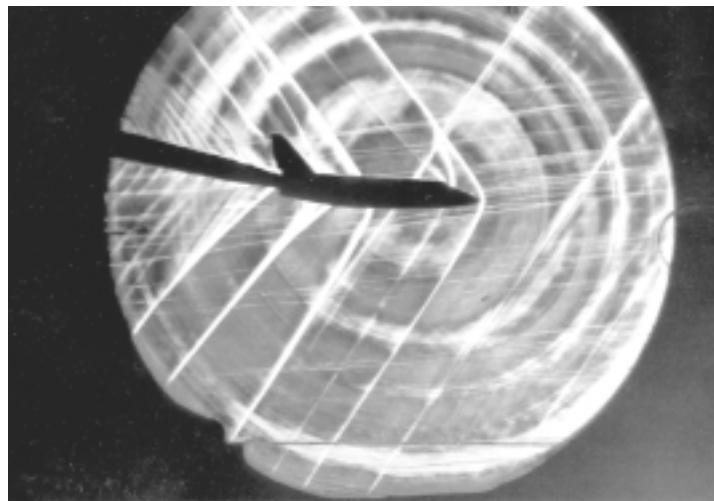
A crucial point to be understood, is the distinction between mere inflation, and a hyperinflationary process, in which it is not the increase in prices per se, but the acceleration of that increase that becomes the driving force. Separating the two is what Komp called a *phase shift*—a qualitative change in the dynamics of the process, which suddenly begins to follow *different laws* than those that appeared to govern it up to the point of the phase change. Exactly this phenomenon was the subject of Bernhard Riemann’s fundamental paper of 1860 on the formation of “shock waves” in physics.

The immediate object of Riemann’s study was the propagation of waves in the air. The most familiar case, from everyday life, is an ordinary sound wave, which maintains its essential characteristics as it is propagating from one point to another. This continuous self-reproduction process of an ordinary sound wave can be described, at least approximately, by a set of mathematical equations.

Riemann demonstrated, however, that when the air is sufficiently strongly compressed, for example by a rapidly moving piston, then the resulting air wave will constantly change its form as it propagates. At a certain point, the wave transforms itself into one or more compression shocks: surfaces across which sudden, discontinuous changes occur in the pressure and other physical parameters of the medium. From this point onward, the newly formed shock waves propagate forward in a different manner than do ordinary waves; they follow different laws than those which appeared to govern the process prior to the occurrence of the singularity.

Riemann pointed out that the mathematical equations

FIGURE 3



NASA/Ames Research Center

*The shock front is generated at the nose of the plane and propagates outwards in a conical array. This photograph is of a test model of the Space Shuttle in a wind tunnel.*

which Euler, Lagrange, and others had devised to describe the behavior of acoustical waves, broke down at exactly the point, where shock-formation sets in. The mathematics collapses, but the wave continues to propagate, reflecting a true physical principle, beyond the reach of formal mathematics. Riemann wrote:

“Therefore, aside from certain exceptional cases, it must necessarily always occur . . . that the differential equations lose their validity, through the divergence to infinity of the differential ratios of the pressure, and that forward-moving compression shocks must arise.”

The physical significance of this explosion to infinity of certain mathematical ratios Riemann speaks about, is this: The propagation of an ordinary sound wave depends on certain self-organizing processes in the medium of propagation (the air), which, in turn, require a certain characteristic time to be completed. This limiting condition is reflected in the existence of a definite speed of propagation of a sound wave, the so-called speed of sound, which, in turn, varies according to the physical condition of the air, its temperature, pressure, and so on. Any attempt to push a sound wave to a faster speed than its internal self-organizing processes can sustain in the given mode, results in a discontinuous change in the condition of the air: a shock wave!

Most people have experienced the formation of shock waves, in the form of the sonic boom generated when a plane accelerates beyond the speed of sound. The nose of the plane compresses the air immediately in front of it, producing a sort of sound wave. As long as the plane moves slower than the speed of sound, the resulting air wave will propagate ahead of the plane. As the plane approaches the speed of sound, however, it catches up with its own sound wave, creating a sudden phase change in the propagation process, which takes the form of a shock front, at which the pressure and other parameters of the air change discontinuously.

As Riemann emphasized, the behavior of such shock fronts is such, that they are originally generated at the nose of the plane and then propagate outwards in a conical array (**Figure 3**).

Now the reader should see the relationship of this phenomenon, to the hyperinflationary transition which took place in May-October 1923, and the one that is taking place now. The equivalent of the speed of sound in an economy, is not a single simple parameter, but rather an overall limiting condition, defined ultimately by the array of short- and long-term physical investment cycles in the economy, and reflected also in the limits of the subjective factor of confidence, with respect to the relationship between monetary and physical-economic processes. Look at this, relative to the thesis typified by Komp’s description, quoted above, of the hyperinflationary trigger-effect of a sudden acceleration in growth of raw materials prices: The rate of change of prices exceeds the rate at which such increases can be absorbed by the economy, without triggering a self-accelerating inflationary spiral.