

# Debt Crisis, Monetary System Instability and Technological Innovation: The Long-wave Perspective\*

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## I. Hypotheses

In a sense, the 1980s are in a position on the Long Wave similar to the 1930s. Based on this assumption, the following hypotheses are presented for analysis.

- 1) Instability and change in relative price structure—broadly defined here to include exchange rates, relative prices for oil and other primary products, terms of trade and inter-country differences in interest rates—have been much greater during the 1980s than in any other period since the end of the second world war.
- 2) The debt crisis, here again broadly defined, worsens. Latin American and other developing countries are not the only ones with debt crises. The United States, the key currency country in international transaction, is now a debtor nation, creating a situation that has destabilized the world economy's very foundations.
- 3) Sharp changes in relative price structure and deepening debt crises are not constantly recurring short-run phenomenon. They are major parts of long continued "global adjustment." They are distinctive attributes of the Long Wave as it makes one cycle every half century; they should be viewed as integral

\* This paper was originally presented to the Conference held in September 1987 by the Institute of Statistical Research in Tokyo, the topic of which is "New Technology for the Revitalization of the World Economy". Incidentally, the author wrote in English the draft report of "Recent Trends in International Monetary and Trade Issues and Japanese Responses Thereto", (Japan Economic Research Institute). This was published on December 1, 1987 as a Special Issue of the Japan Industrial Journal (Nihon Kogyo Shimbum). It includes views similar to the present paper.

parts of the Long Wave.

- 4) The international economy in the post-second-world-war era seems to have passed through three phases: 1) long-term prosperity without inflation, 2) inflationary overheating, and 3) the after-effects of phase two. The Long Wave is still within the end of the post-war cycle. The sharp fluctuations in relative price structure and the deepening debt crisis may thus be taken as characteristics of the third phase.
- 5) In the first phase, increases in the money supply did not cause serious inflation, they functioned rather as growth-push money. They became factors for overheating, however, in the subsequent second and third phases, where non-neutrality of money worked to greatly distort the real economy. Severe changes in relative price structure and expanding debt crises were reflections of the distortions pointed out here. In this sense, the third phase was a consequence of severe preceding-inflation.
- 6) The turn down phase in the Long Wave is assumed to be a process of conflict between technological innovation and debt crisis. Therefore, a period of low interest rates and a shelving of debt, if it actually emerges, may give the debtor countries enough agility and buoyancy sooner or later so that the Long Wave's phase of retardation can evolve into a new phase of buoyancy. Fundamentally, however, technological innovation has to provide strong impetus for new long-term prosperity. It is this reason that makes decisively important prediction of the economic impact of microelectronics, biotechnology, new materials and, most interestingly, the newly emerging superconductivity early in the next century.
- 7) The alternating of systems of fixed exchange rates with systems of floating rates may, in a certain sense, be a phenomenon concomitant with Long Waves. However, international cooperation, particularly in periods of transitional instability, is indispensable for stabilizing currency exchange rates and for solidifying the foundations of progress and stability in the international economy. How the international currency system is to be configured is, therefore, an important consideration in such cooperative efforts.

## II. Debt Crises and Sharp Changes in Relative Price Structure

Theories on the long-term growth process frequently assume that

price levels and relative price structure do not change. However, they have actually gone through violent, long-term cyclical changes in the dynamic processes of history, particularly in the 1930s and 1980s.

Briefly comparing and contrasting the 1930s and 1980s:

- 1) In the early 1980s, the per-barrel price of crude oil went up, temporarily, to 34 dollars, then plummeted to 28, with purchases at one time going as low as 10 dollars on the spot market. Relative prices of primary products, in terms of industrial product prices, are on a declining trend from the mid-1970s on. In the 1930s, too, relative prices of primary goods declined—an important factor accelerating the onslaught of the Great Depression (see Kindleberger 1973; Lewis 1949).<sup>1</sup>
- 2) Prior to the Group of Five's Plaza Agreement, the yen rate hovered around 250 to the dollar. It then dropped to the 150-160 level in 1986(averaging 168 for the year) and fell, even to below 130 in 1987-88. In 1931, the yen in British Sterling, was at 2 shillings, 2 pence, but in 1934 it dropped sharply to 1 shilling, 2 pence.
- 3) Terms of trade changed severely as a reflection of trends in oil prices and exchange rates. For Japan, terms of trade turned sharply for the better with a 40.2 point rise in the index from 1985 to the former half of 1988. Similar phenomena occurred before the second world war. Although Japan's terms of trade deteriorated by 39.5 percent in the 1927-37 period, Germany's improved by 39.2 percent in the same period and the United Kingdom's terms of trade turned up by 22.3 percent in 1927-33.
- 4) During 1980-84, the debt crisis adversely affected the imports (in dollar terms) of many Latin American countries, dropping them sharply by 40-50 percent. At the same time, net external debt for the United States, the key currency country, climbed to 368.2 billion dollars at the end of 1987. If the U.S.'s current account deficit continues at present levels, its outstanding net external debt will exceed 800 billion dollars in 1990. After the first world war, the United States invested actively overseas, particularly in Europe and Latin America to counter a severe

<sup>1</sup> Charles P. Kindleberger. *The World in Depression 1929-1939*. The University of California Press, 1973, Chapter 4; W. Arthur Lewis. *Economic Survey 1919-1939*. London, 1949, Chapter 3 and 8.

post-war capital shortage. That investment bounced up from 420 million dollars in 1923 to 1.25 billion dollars in 1928, but was slashed sharply and suddenly by 46.4 percent to 670 million dollars in 1929. The stock markets then collapsed and the international financial market destabilized to shape the fuse that blew the world into the Great Depression.

The similarities between the 1930s and the 1980s are in that one country's (Japan's) capital exports have risen to enormous levels and a major economic power (the United States) has become a debtor nation. The two decades share this common phenomena of disproportionate distribution in international money, which worsens instability and the other difficulties the world economy faces.

The wide-ranging changes in relative price structure and the spreading debt crisis have lengthened recessions in the 1980s dramatically. Before the 1971 "Nixon Shock," recessions in Japan were 10 to 12 months long, but the recession that started in February 1980 lasted for three years, a three-fold increase. The European countries have had similar experiences. The business cycle reference dates for the 1930s show long recessions: 43 months for the United States, 40 months for Germany, 37 months for Great Britain and 28 months for France.<sup>2</sup>

Sharp changes in relative price structure, which most modern dynamic theories take as constant, and the development of debt crises, which are apt to be theoretically abstracted, thus seem to be integral to the Long Wave's descending phase.

### III. Tumult in the Exchange Rate and the Currency System

The U.S. current account deficit for 1987 was 161 billion dollars. If that deficit continues for three years at the present rate, it will total a cumulative 483 billion dollars. Adding that to net external debt—368.2 billion dollars at the end of 1987—gives a net external debt for 1990 in excess of 800 billion. Some (e.g., Thurrow, Kraus, Feldstein) contend that if that trend continues, the dollar, the key currency, will take a sharp nosedive down to the 100 yen level.

Others (e.g., Mandel, McKinnon) take 1973 or several years average as the base year for Japanese and American wholesale price indices, contending that computations of purchasing power parity

<sup>2</sup> Arthur Burns. *The Business Cycle in a Changing World*. NBER, New York, 1969:16-7.

show around 170 yen to the dollar to be the most appropriate exchange rate. But, the yen-dollar exchange rate has frustrated around 125 to 150 yen to the dollar for the last three years. That exchange rate is the apparent median reflecting differences between purchasing power parity in the two countries and differences in their macro-policies, i.e., the American federal government's past increase in deficit and the Japanese government's past decrease in deficit.

Several factors have recently appeared, however, to suppress the yen's steep climb to the 100-to-the dollar mark.

- 1) The sharp decline in the dollar to the 100-yen level will make people aware that boosts in import prices also move up the rate of inflation in the United States.
- 2) The dollar's sharp decline and concomitant withdrawal of investor funds from the U.S. may intensify fund shortages and heighten interest rates.
- 3) From cost perspectives, increasing inflation and interest rates will decelerate U.S. economic activity and growth.
- 4) That is not all. An extreme drop in the dollar toward the 100 yen mark may further intensify the world recession. Despite U.S. pressure on Japan and West Germany to increase domestic demand, a violently dropping dollar will worsen the recession just that much more and negate efforts to increase domestic demand. The common understanding reached at the Venice Summit that: "further declines in the dollar are counterproductive," shows an awareness of the above four points among the leaders and shows that that awareness will serve, to some degree, to stabilize the dollar.
- 5) But, simultaneous withdrawals of funds from the United States will create stupendous drops in the dollar, and be a major cause of international financial market destabilization (such as the Black Monday, in October 19, 1987) that may spark world recession. If the U.S. becomes aware of this, the 130-140 yen to the dollar rate may continue a little bit longer.
- 6) Japan's direct overseas investment has been rapidly swelling, and as a result its overseas production will go up, exports will fall, and imports will rise, thereby pushing down Japanese trade surplus.

However, the recent trend of spot oil price to fall below 15 dollars per barrel from around July 1988 seems to cast an additional downward instability of the value of dollar, despite a gradual stabi-

lization of the U.S. exchange rate so far observed.

Basically, however, the U.S. must make a concerted effort to stabilize the dollar by reducing its federal deficit, which rose above 200 billion dollars in 1985 and 1986. Japan and Germany will, of course, have to work to expand domestic demand to offset, to greater or lesser degree, the deflationary trends that U.S. efforts to hold down the deficit may incur. But, as long as there are no ongoing improvements in fundamentals, the international currency system will continue to be unstable.

It was once imagined that the floating exchange rate would drive out speculation, thus stabilizing the exchange market. However, that notion was based on an assumption that fundamental factors of instability do not exist in the world. But, now the world economic situation is basically unstable because the nation whose currency is the key medium of exchange is a debtor.

That makes correcting fundamentals a basic necessity for stabilizing the international currency system.

But, those who say that if the fundamentals are unstable, we can take it easy in efforts to stabilize transitional exchange rates, are wrong. We have to strengthen multilateral surveillance through international cooperation, and, if possible, place some sort of institutional boundaries on exchange rate fluctuations. We also have to arrive at a consensus on the kind of procedures that will allow the macro-policies of every nation to conform to that system.

Even if corrections in fundamentals are basically necessary, once we are aware that the dollar's head-long dive to the 100-yen level will probably wreak havoc on the world economy, then our most important task for the time being is to explore ways to prevent a collapse in an unstable world.

#### IV. Technological Innovation, Money Supply and the Long Wave

Kondratieff cites five factors of the Long Wave: 1) technological innovation and investment, 2) expansion of frontiers, 3) war and revolution, 4) gold production (money supply), and 5) agriculture (resource limitation).<sup>3</sup>

According to Schumpeter, factors 1) and 2) can be treated en bloc

<sup>3</sup> N. D. Kondratieff. "The Long Waves in Economic Life". *Review of Economic Statistics* 17 (1935); repr. in G. Haberler (ed.), *Readings in Business Cycle Theory*. Philadelphia: Blakiston, 1951.

as factors of technological innovation, and we can assume that 3) and 4) can be combined as factors of money supply. The reason for including war and revolution with money supply factors is that during war, without exception, fiscal deficits swell currency volume to gigantic proportions. Thus, interaction between technological innovation and money supply may cause capitalist dynamics to copy past Long Waves before it has a run-in with resource ceilings and overheats. This is a type of limit-cycle theory.

But, as mentioned above, undulations in the Long Wave have three phases. The first is one of long-term, non-inflationary prosperity. Even if fiscal expenditure, private investment and private consumption grow in the same direction in this phase, they do not induce serious inflation. It is a positive-sum world. When this phase occurred, most people did not think it strange that multiplier and growth theories were based on assumptions of invariability in price level and relative price structure. In this sense, the phase may be a Keynesian world. But in the sense that rapid technological innovation raised productive capacity but did not create serious inflation, it would be more accurate to say that the phase was a Keynesian-Schumpeterian world. The growing money supply functioned then as growth-push money, which could not cause inflation.

But after twenty years of unbroken prosperity without serious inflation, resources reached a limit, retarded the tempo of technological innovation in the industrialized nations and placed the Long Wave into a near-zero-sum phase. Even during that phase, there was no actual attempt to stop the expansionist macro-policies embarked upon earlier. The lack of such an effort moved the Long Wave into its inflationary overheating phase. When oil price levels were low, there seemed to be no end to the demand for crude. But the oil producer nations' restrictions on supply and subsequent soaring prices brought demand to a screeching halt. That is when oil crises produced overheating. It was a non-Keynesian zero-sum world. If fiscal deficits has risen excessively in this phase, high interest rates would have reduced private investment.

At first glance, the second phase definitely looks like a monetaristic period. Since the quantity theory of money is wed to classical theory, increases in money supply should cause proportional across-the-board increases in prices, so that in that sense, the quantity theory regards money itself, as neutral, or veiled. However, dramatic increases in the money supply and in resulting inflation have disruptive effects on the real economy; then the money supply is not

neutral. As mentioned, disproportionate changes in prices emerge in the process of inflationary over-heating and sharp changes in relative price structure are an intrinsic part of the subsequent, protracted process of adjustment (third phase). Thus, the real world does not move as the quantity theory suggests in either second or third phase. This is seen with crude oil, where until a certain period, the relative price soared but then dropped sharply.

Preceding-inflation also increases external debt. Of course, the factors causal to increases in external debt are not monotoned, they are complex. However, the Latin American countries have broken world records for intense inflation and huge external debt, while South Korea, Indonesia and the Philippines at one time experienced heavy inflation with greater external debt than other Asia-Pacific countries. These facts permit what I call the "preceding-inflation hypothesis" of external debt: that inflation is a long-term cause of increased external debt.

When inflation intensifies: 1) Fear of losing the real value of liquid assets lowers the domestic savings ratio. If attempts are made to maintain constant growth, they inevitably increase the inflow of capital from overseas. 2) The course of inflation delays exchange rate adjustments, tends to cause the overvaluation of exchange rates. Those two factors worsen current accounts and increase borrowing from overseas. 3) If an attempt is made to avoid the capital loss in liquid assets caused by hyper-inflation, capital flight will increase and the balance of payments worsen through this route as well.

Because the background of long-term factors that produce these difficulties lies in preceding-inflation, the need to avoid the above three trends forces an emergence of increased external debt. Excessive expansion of the money supply or preceding-inflation will not, in this sense, increase all prices proportionally and leave the real economy unaffected. It will deal a serious blow to the real economy by distorting savings ratio, exchange rates and other relative prices, inducing capital flight and increasing external debt.

These factors actually increased external debt and were ultimately crucial to Latin America's extraordinary cuts in imports during the first half of this decade. But those are not the only consequences of preceding-inflation. If domestic inflation continues, it will increase a kind of employment that is sustainable only by continued inflation. Thus, when government implements programs to halve the rate of inflation from 20 percent, it also cuts back on inflation-cre-



ated employment. What is important here is that even though inflation is reduced to 10 percent, excess demand still continues. But just because the inflation rate is being reduced, and even though there is excess demand, unemployment is also being forced to increase. The situation is "unemployment during inflation."<sup>4</sup> It seems to show that inflation is not neutral in relation to the real economy and that applies to the domestic economy as well.

Thus, we see that hyper-inflation greatly distorts the real economy and affects it detrimentally and non-neutrally. "Prosperity without inflation" eventually evolves into inflationary overheating and continues during the third phase, where it seriously affects the real economy. Moreover in that third phase, knotty economic problems arise that minor policy adjustments cannot easily cure. Thus, the effectiveness of macroeconomic policy takes a big slide downward during the Long Wave's process of adjustment. That effectiveness is reduced because policies to bring down unemployment push inflation way up and policies to suppress inflation boost unemployment. Reflationary policies for eliminating these difficulties may also work, in the long run, to increase external debt.

## V. Toward the 21st Century: New Innovation in Technology

Considering that fifty years have already passed between the 1930s and 1980s is an indication that the world economy's Long Wave may soon be heading upwards. History does not repeat itself exactly and the durations of the Long Wave are not fixed. This is the reason for taking a brief look at the Long Wave beginning from its post-World-War-II peak around 1970. Tracing back 50 years takes us to 1920, the peak of the previous Long Wave. Moving forward 50 years takes us to 2020, the next probable peak. The cycle could of course shorten or lengthen in the future, peaking either near 2010 or 2030. One thing for certain is that the next ten years will give rise to factors that gradually remedy the economic difficulties of the 1980s. Not only that but the emergence of new technological innovation may play a major part in turning the Long

<sup>4</sup>"The Campaign against Keynesian Inflation", Chapter 13 of F. A. Hayek, *New Studies in Philosophy, Politics, Economics and the History of Ideas*. The University of Chicago Press, 1978; Miyohei Shinohara. "The Present World Economic Impasse and Hayekian Interpretation of the Coexistence of Inflation and Unemployment". *Philippine Review of Economics and Business* (June 1983).

Wave up. The beginning of the 21st century will probably see the Long Wave on an ascending course.

Nevertheless, I believe the 1980s has been a decade of "global adjustment". If this is true, then a low interest era will appear after the money game era, particularly when the U.S. federal government deficit will follow a gradual decline in the coming decade.

Yields on long-term U.S. government bond began to decline after the first world war to 5.3 percent in 1920, 3.3 percent in 1933 and 2.05 percent in 1941. In 1981, the same bond yielded more than 14 percent, but in early 1987, it had dropped to 7 percent with some rise to 9 percent in June of 1988. Even if outstanding debt does not fall enough, declines in interest rates may produce a situation that gives debtor nations more room for maneuver. What role will the discovery of new technologies add to this? Microelectronics, robotics, biotechnology, new materials and other advanced technologies will be widely used by the end of the century. However, they have yet to provide the satisfactory buoyancy effect, one reason being that negative pressures from processes of adjusting debt crisis and relative price structure are still greater than positive pressures of new technological innovation. Another reason is that technological innovation oriented toward producing smaller and lighter products has lower ripple effect on other industries, and thus lower employment effect, than past technological innovation that was oriented toward large, heavy products.

Science, engineering and industry are keeping an eye on recent discoveries in room-temperature superconductivity and speculating on the role it will play. When room-temperature superconductivity is eventually utilized, it will almost certainly have extraordinary ripple effect on every industry. One of the important things it will do is to make possible a linear motor car that travels at 500 kilometers per hour. A train of this type will provide, for example, Japanese commuters living in Yamanashi Prefecture about 150 kilometers away from Tokyo with much faster access to the center of Tokyo. It will probably revolutionize the basic concepts that people have of the urban and the rural, the city center and the outlying environs. If trains like these can go into service in big countries like China, they will revolutionize transportation, accelerate the pace of economic development, and have major economic impact on neighboring countries. It is not clear at present to what extent the linear motor car can go transcend the passenger stage and be used in transporting freight. But the potential for a high-speed transport

mode like that seems unlimited.

Another important thing superconductivity will do is to bring the long-held dream of nuclear fusion into the realm of reality. Nuclear fusion would eliminate almost every restriction now imposed on the energy supply. But it may take a long time. Superconductivity will also make the storage of large amounts of electricity much simpler than now.

The development of superconductive coils will revolutionize the field of electrical power supplies and transformers. Power supplies and transformers now have to be very big and bulky, and they are vital to every kind industry. The development of superconductivity will mean that the huge replacement demand for these big units will be created, and it may be of unprecedented scale.

Superconductivity also presents unbounded possibilities with micro-miniature high-speed computers. In addition to the inestimable contributions to important contemporary technologies like microelectronics and biotechnology, the broad range of superconductivity applications may be a new force supporting the world economy early in the next century.

Of course, the clashes between the arrival of new technology and the phase of overheating at the Long Wave's peak have so far seemed to be inevitable, but there is nothing to guarantee that they truly are. Assume that no nuclear war occurs, that energy restrictions are generally unimportant, thus eliminating the kind of overheating in the economy that the oil crises have induced. The Long Wave would then generate peaks without overheating. However, Long Waves that do not have overheating in their baggage are clearly something the economy has yet to experience. Human beings may not be capable of reaching the limits in capacity that these new technologies permit. But if they do not, it will not be because of an excess capacity caused by a shortage in effective demand. More than likely it will indicate a gap between technological level and human ability or willingness to use that technology. If there is such a gap, the peak in the 21st century Long Wave may extend forward in time.

If there is no overheating, then overheating will generate no after-effects. If the situation continues with no strong ceiling on overheating, it may overly protract the Long Wave's rising phase during the early part of the 21st century. We cannot see that far ahead, the period permits only conjecture. But the frame of observation described here may yield the conclusions stated above.

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