
# JAPAN AS HYPER-CONSTRUCTION STATE: FISCAL, FINANCIAL AND ENVIRONMENTAL CRISIS

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Japan was derailed from its economic growth track in 1991 and other East-Asian countries followed in 1997. These economies now labour under the burden of an immense accumulation of non-performing debts. The largest cause of this indebtedness has been ill-considered development projects that are environmentally destructive and financially unsustainable. This implies that a healthy environment is an essential condition for economic sustainability. The long-cherished assumption that economic growth and environmental conservation are alternatives can no longer be maintained.

From this orientation, this paper deals with the following:

- the financial crisis in Japan's central government finances, local government finances, and the 'Fiscal Investment and Loan Program', or the composite of all three, which we refer to as Japan's 'Fiscal Triad'
- the financial disaster in the tripartite complex of finance and insurance, construction, and real estate
- mutual interrelation between the above two sectors (the public finances and the tripartite complex) and the political structure.

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forming the so called 'Iron Triangle' now threatening the nation's financial stability

- the historical transition affecting Japan's industrial structure, showing a trend towards industrial saturation
- the consequences of the interaction between the above-mentioned factors
- the environmental destruction caused by Japan's construction complex and the Iron Triangle.

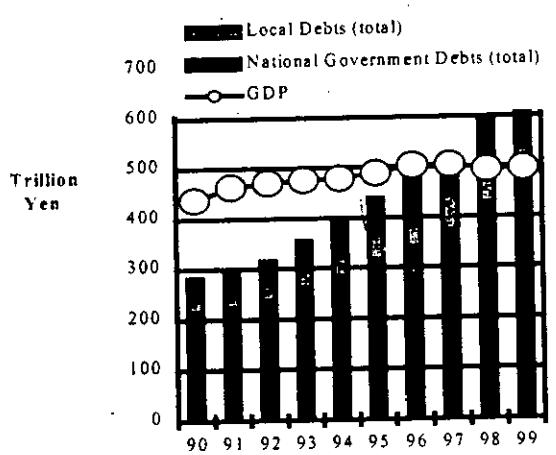
## The Public Sector Fiscal Crisis

Japan's fiscal plight is indicated by the central governments' revenue/expenditure balance. In the budget for financial year 1999-2000, the dependence of the national revenue on government bonds is officially estimated as 37.9%; the revenue from debt is 31.0 trillion yen and the total (gross) governmental revenue was 81.9 trillion yen. A more accurate debt/revenue analysis, however, gives another result. The said gross revenue includes the debt service payments (19.8 trillion yen), the deficit covering expense for 1998-99 (1.6 trillion yen) and the local allocation tax grants (13.5 trillion yen) that must be subtracted from the gross revenue because they are obligatory expenditures for the central government. The net (disposable) revenue of the government, therefore, is only 46.9 trillion yen. Thus the debt to net-revenue ratio amounts to 66.1% (31.0 divided by 46.9). The debt dependence could be further aggravated if a supplementary budget is produced in response to pressure from Liberal Democrat politicians and, possibly, the American government (Budget Committee of the House of the Representative, 1999: 4.)

The accumulation of public-financial deficits by general governments and municipal corporations is shown in Fig. 1. This includes, besides the (central) government bonds, governmental debts in various special accounts (usually called 'hidden government bonds'), debts of local governments, and liabilities of municipal corporations. Discussion of Japan's debt problem commonly deals with the government bonds alone,

resulting in a serious underestimate of the crisis.

**Figure 1: Accumulation of Public-Financial Deficits: Government Bonds, other Government Debts, Local Government Debts, and Liabilities of Municipal Corporations**



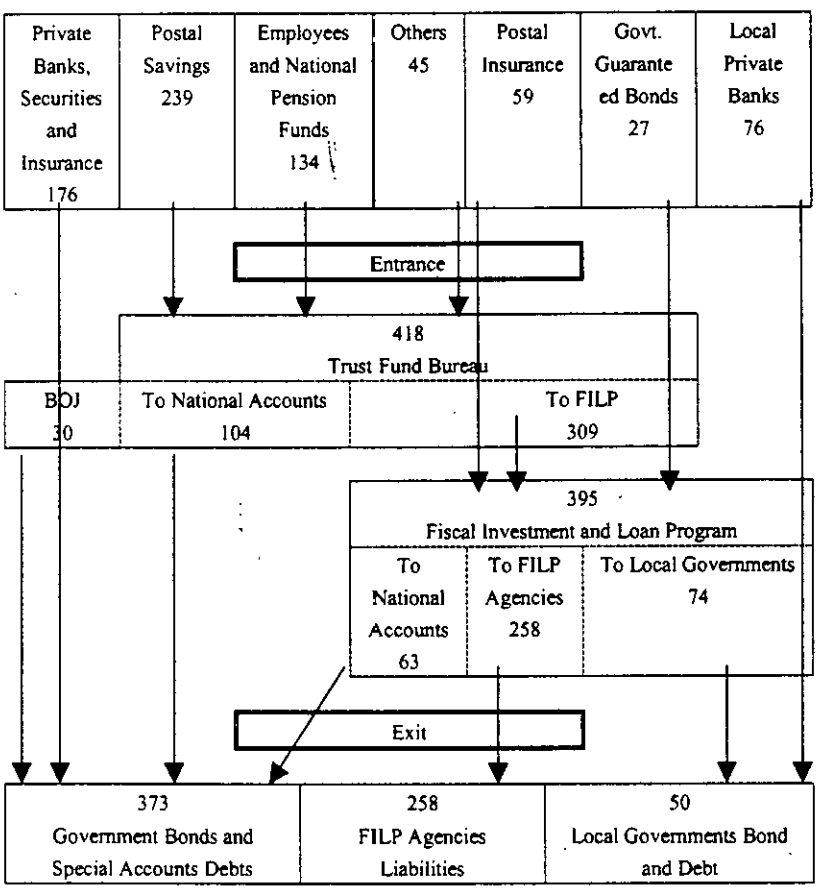

*Source*: Budget Committee of the House of the Representative (1999: 98, 99, 179).

Japan's fiscal system comprises another important source of public debt: the Fiscal Investment and Loan Program, FILP (also known as Treasury Investments and Loans, TIL), using funds from the postal savings, postal life insurance, and annuity pension funds, etc. The FILP amounts to 52.9 trillion yen in the 1999-2000 budget. The FILP has surpassed 50 trillion yen since 1993. Although described modestly as 'the second budget', the FILP regularly exceeds the general administrative expenditure in the national budget:

If the FILP expenditure is added to the ordinary budget, the governmental expenditure based on debt amounts to 83.9 trillion yen in 1999-2000. In this same year, local governments plan to issue municipal bonds amounting to 11.3 trillion yen and to borrow 7.6 trillion yen from the central government. In addition, special public corporations are heavily indebted because of their extravagant development projects to the tune of tens or hundreds of billions of yen. These organisations are the

largest and greediest absorbers of the FILP funds. Moreover, the organisations within the so-called the 'third sector' (half-municipal and half-private corporations) have accumulated enormous liabilities on government security.

**Figure 2: Outstanding Balance of the Total Public Debts Including the Fiscal Investment and Loan Program (FILP)**




Nb: End of Fiscal Year 1997 (trillion yen)

*Source*: Budget Committee of the House of the Representative (1999: 98. 99. 149, 150).

As of the end of 1997-98, the sum total of the public debts of the general governments, municipal corporations, and special public corporations is estimated to exceed 781 trillion yen. Outstanding public debt is estimated at 373 trillion yen for the central government, 150 trillion yen for local governments, and 258 trillion yen for the FILP-financed institutions. This total public debt corresponds to a formidable burden of 6 million yen *per capita*.

A breakdown of the total public debt by sector is illustrated in Fig. 2. The outstanding public debt sums to 781 trillion yen as of March 1998. In 1993, Cabinet adopted a 'Basic Plan for Public Investment', designed to stimulate the economy and to meet the US government request to boost imports. Under this plan, 630 trillion yen was to be allocated to public works expenditure over the coming decade. The plan had once been dropped because of the aggravating fiscal crisis, but was revived because of the deepening recession. It is impossible to isolate the plan from the 'ordinary' public investments of tens of trillions, so the public debt will inevitably be doubled in the same period because all of the Plan will have to be financed by public bonds.

Private financial assets are estimated to have reached 1,228 trillion yen as of Sept. 31, 1998. Total public debts are 781 trillion yen. It is evident that Japan's banking system is dangerously dependent on public finance.

## Structural Analysis of the Crisis

Japan's fiscal system consists of three components: central government finance, local government finances, and the FILP (TIL) system. The last, peculiar to Japan, has served to inflate Japan's fiscal deficit beyond the taxpayers' control. The outstanding FILP finance, rivalling the GDP, is controlled at the discretion of the Ministry of Finance (MOF) and its FILP management bureau. Nominally the Diet controls the FILP, but in fact the MOF controls the Diet financially.

The three public finance sectors form a Fiscal Triad that controls more than one third of GDP, or about 190 trillion yen. Figure 3 shows the relations of the three sectors. The frame width is proportional to each annual budget. The overlaps between the frames indicate a financial

transfer within the Fiscal Triad, e.g., from government or FILP to local governments. This overlapping is introduced to avoid counting the same fund twice (Kawamiya & Aoki, 1996).

Each expenditure sector comprises two parts: general administrative expenditure (a), and construction-related spending and public debt expenses (b). The former causes the latter: accumulated construction bonds stiffen government finance and necessitate issuance of deficit covering bonds. If one sums all (a) terms and all (b) terms, one obtains a consolidated account of the Fiscal Triad expenditure. In addition, each revenue sector is made up of two sources: (a') the tax and stamp revenue and/or (b') the bond revenue. The two can be lumped together as shown in the lower part of Figure 3.

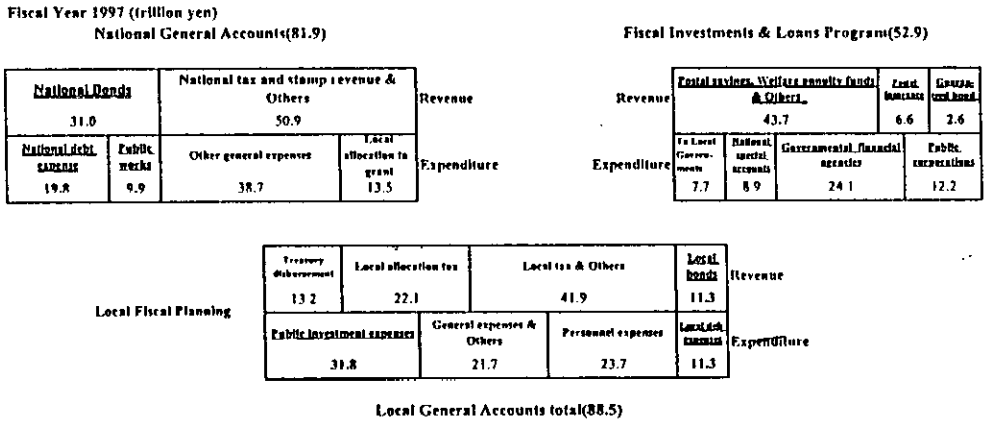
As shown, the proper FILP does not include fiscal investment in government bonds. In the text, however, the term FILP denotes the Treasury Investment and Loans as a whole.

Comparison of the consolidated revenue and expenditure reveals a close correspondence between excessive dependence on public debts and excessive construction spending. Evidently this correspondence is relevant to the Japanese fiscal crisis: in decisions regarding public budgets in Japan - expenditure comes first and revenue follows, flexibly adjusted by public borrowing. Most public investments have been financed by construction bonds, and most public debt expenses have been to repay them. An inevitable consequence of this structure is unlimited expansion of the public debt.

## FILP as a Breeder of Public Debts

The debt-addicted behaviour of Japan's general governments is plain. Less well known is that Japan's Ministry of Finance (MOF) is the world's largest debtor and creditor. It manages an outstanding FILP

## Figure 3: Annual Budgets of the Fiscal Triad Consisting of Government finance, Local Government Finances, and FILP (Fiscal Investment and Loan Program)




| Tax Revenue and Other Cash Revenues(92.8) | | Debt and Loan Revenue(96.1) | |
|---|---|---|---|
| 49.1% | | 50.9% | |
| General Expenditure(70.9) | Debt Expenditure(31.1) | Construction Investment Expenditure(41.7) | Governmental Investment & Financial Expenditure(45.2) |
| 37.5% | 16.5% | 22.1% | 23.9% |

Nb: Fiscal Year 1999 (trillion yen)

*Source*: Kawamiya & Aoki (1994); Kawamiya & Aoki, (1997); Budget Committee of the House of the Representative (1999: 4,136,145-8)

balance of 504 trillion yen as of 31 March 1997[1]. But is this huge credit performing?

Since 1993 the MOF has been spending over 50 trillion yen annually through the FILP alone, a sum which rivals the total assets of the world's largest banks. The outstanding balance of all FILP funds amounts to 504 trillion yen, equal to one seventh of the gross global product (US$25.8 trillion in 1994). Are the MOF bureaucrats competent enough to manage that large fund? If not, the MOF is likely to become a Leviathan 'Ponzi financier', to be exploited by irresponsible debtors.

The worst FILP fund recipient, Japan National Railways Settlement Corporation, had a debt of 23 trillion yen (including non-FILP loans) and had no profitable business in the 1990s. Yet it continued to pay its annual interest payments of 1.3 trillion yen, being financed by FILP until March 31, 1997 (after which the final debt of 27.7 trillion yen was transferred to the national account). The second largest borrower, Japan Highway Public Corporation, engages in unlimited construction of non-lucrative highways, depleting the profits from major trunk highways. Finally the largest and once reputable borrower of FILP funds, the Housing Loan Corporation, has fallen into difficulty because its sound borrowers now switch their H.L.C. loans to commercial bank loans: the latter can offer much lower interest rates. Meanwhile, risky borrowers are failing to meet the debt service payments as they lose income due to the recession and 'restructuring.' Owing to the prodigal FILP fund, most FILP agencies expand their investments recklessly and rely upon incessant feeding of FILP funds even to make up operating losses.

The MOF itself utilises the FILP as an ersatz national budget, in which the administrative (non-lucrative) expenses to be covered by the tax revenue are replaced by interest-laden FILP 'investments'. This process is called 'Zaitou-ka' (FILP-isation) of the national budget, or 'Yosan-ka' (budgetisation) of FILP (Miyawaki, Atusi (1995: 180ff.). The Fiscal Triad has long made an Aladdin's magic lamp for the Iron Triangle. But who is paying the ultimate cost?

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1 The sum 504 trillion yen consists of Trust Fund Bureau fund 418 tr. yen, Postal Life Insurance fund 59 tr. yen, and Government Guaranteed Bond 27 tr. yen.

The central and municipal governments and public corporations have long been engaged in unnecessary construction. Built according to political needs, roads, tunnels, bridges, seaport facilities, dams, and reclaimed lands remain often in virtual disuse. The major construction projects have been financed by ever-expanding construction bonds, compelling issuance of deficit covering public bonds and deepening the total fiscal crisis (Fig. 2).

For financial years 1992 - 1999 the annual tax revenue of the general government has always been and will be less than 90 trillion yen, insufficient to pay for ordinary administrative expenditure or service interest payments, leave alone to repay the debt principal. Therefore public bonds had to be issued incessantly. Net revenue cannot cover domestic administrative expenditures. Strangely, Japan's ODA (Official Development Assistance) of about $1 trillion is now financed by deficit-covering bonds. Moreover, Japan's emergency credits to ailing Asian economies are being financed by loans in Japan, which implies that Japan is now transferring its foreign non-performing debts into Japan.

## The Private Sector Financial Crisis

Until 1996 annual bankruptcies in Japan had totalled between 6 and 9 trillion yen. In 1997-98, they suddenly rose to 15.1 trillion yen (17,439 companies) and, in 1998-99, to 15.2 trillion yen (17,497 companies) (Teikoku Databank, 1999). Bankruptcies are now occurring among companies that have been maintained by financial transfusions, previously being regarded as 'too large to bury'. Most bankrupts are real estate developers, construction companies and financiers - those who promoted reckless development projects during the late 1980s. They built or tried to build golf courses, ski slopes, marine resorts, and deluxe resort condominiums, or simply bought land for speculation.

Hokkaido Takushoku Bank, the first bankrupt among city banks, borrowed 1.8 trillion yen from the Bank of Japan for its settlement in November 1997, but the Bank was dissolved without the loan being repaid. When Yamaichi Securities became insolvent it had a consolidated liability of 6.7 trillion yen. Regarding the Yamaichi case, Nobuhiko

Matsuno, MOF Securities Bureau Chief, testified to the Diet on 18 March 1998, admitting that he had recognised Yamaichi's disastrous loss in 1992. At that time he painstakingly developed a tricky transaction to conceal the loss (AERA, 1998). The MOF was working to window-dress even private financial losses as well as public fiscal deficits.

Since the bubble burst in 1991, the major bankrupts have been rash developers and their creditors. When bankruptcies occur, environmental destruction is the major long-term outcome. In 1997, 16,365 companies went bankrupt, leaving default liabilities of 14 trillion yen. Note for comparative purposes that it took about $124.6 billion (15 trillion yen) to settle the Savings and Loan crisis in the US in the late 1980s (Seidman, 1996).

In Japan during the 1980s development-related industries such as construction, real estate, and banking promoted mutual interactions. The construction industry began to play the role of financiers, creating credits for its customers in the following way.

A construction company *A* makes a development plan and sells it hard to a naive landowner *B*, who borrows money from financier *C* to pay for the construction cost. However, *A* gives a full guaranty for *B*'s loan. This in turn impels bankers and non-bankers to transmute into developers: they virtually omit examination on feasibility of the investment plans. Such a business practice became customary, called 'Zouchuu' or Order Creation (Kawamiya & Aoki, 1998). All these conspiratorial practices promoted development euphoria, which reciprocally boosted the land and the stock market. When *B* fails and goes bankrupt, *A* suffers double losses of the unpaid construction charge and the guarantee for B's bank loan. *B*'s bad loan to *A* then directly transfers to *C*. This 'domino' failure accounts for the greater part of the major bankruptcies of general construction companies and their banks.

Similarly Japanese banks have been acting almost as developers. When the Eurotunnel Corporation failed, Japanese banks constituted its largest creditor group (holding 20.6% of the liabilities). When East-Asian economies stumbled in July 1997 the largest creditors and the hardest sufferers were Japanese banks. Whenever and wherever a large development project fails, its largest creditors would be Japanese banks.

Regardless of feasibility, Japanese banks have responded to big projects by automatically secreting immense funds like Pavlov's dog.

## The Macroeconomics of Mushrooming Private Sector Liabilities

The result of this process has been unlimited expansion of development-related liabilities, which sooner or later must turn into non-performing debts. In January 1998 the MOF estimated the amount of bad credits as 76 trillion yen, but is that estimate reliable? It is insufficient simply to sum up the bad loans declared by financiers, because they are liable to conceal their bad credits as far as possible.

To cast light on this problem we compare the total financial liabilities with the total tangible assets in Japan. Up to 1991, when the present recession set in, total domestic assets had never fallen below total liabilities (Fig. 4). Since 1992, financial liabilities have exceeded total assets and the gap is steadily widening.

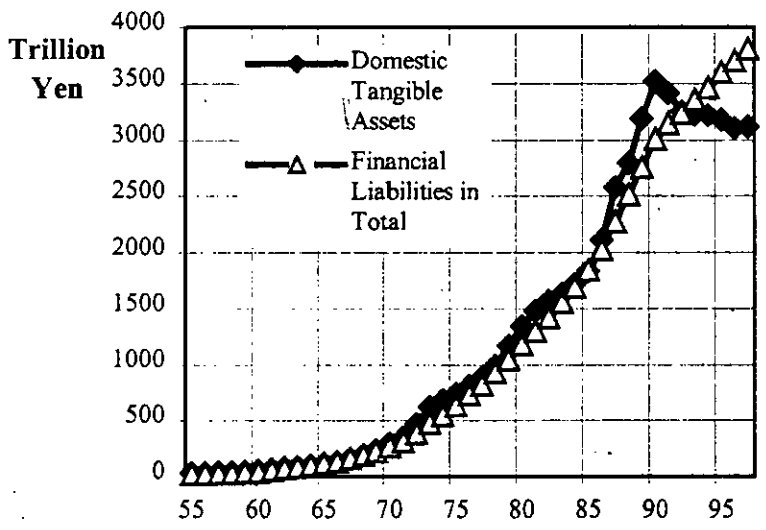
What does this dismal situation imply? It is generally believed that financial liabilities should cancel with financial assets. Some loans can be offset with some credits. For example a non-bank can offset its loan from a bank with its credit to a real estate company. By contrast, however, a prime depositor would not agree to cancel out his saving in the bank with the bank's loan to him, and an ultimate borrower cannot cancel his loan with the credit given to him.

These final borrowers have to pay the highest interest rates. The interest taken by intermediate borrowers/lenders is only part (profit margin) of the last borrowers' interest. These final debtors have to earn their income by managing their tangible assets and, at least, they cannot do so by the appreciation of someone else's interest payments. Fig. 4 shows that the negative gap between total assets and the total liabilities is relentlessly increasing. This implies that the final borrowers, lacking sufficiently profitable assets (or other incomes), are failing to repay their debts.

The total liabilities for the nation amounted to 3810 trillion yen at the end of calendar year 1997, and are increasing at the rate of 100 trillion yen per year (Economic Planning Agency, 1999: 334). As the total liabilities

are not covered by total tangible assets, they must be covered by real (non-financial) income. This is hardly attainable because the total liabilities annually require 38 trillion yen or 8 percent of Japan's GDP, even if the interest rate is only one percent.

**Figure 4: Domestic Tangible Assets and Financial Liabilities**




*Source*: Economic Planning Agency, *Kokumin Keizai Keisan Nenpou* (Annual Report on National Account), 1955-1999.

Such situations are undermining not only the financial stability but also the *raison d'être* of the financial institutions. This coincides with endless series of financial scandals pervading from credit unions, the notorious Jusen companies (non-banks for housing and real-estate loans), city banks, trading firms, securities companies, general construction companies and general merchandise stores and, finally since 1997, extending to the MOF itself.

It is unquestionable that any interest payments (e.g., one percent or so) on the total national liabilities would exceed maximum possible GDP growth (probably one percent or so). The former is about 38 trillion yen and the latter is about 5 trillion yen. This highlights the profound frailty of Japan's financial institutions as a whole: so it is highly doubtful that they can bear the so-called `Big Bang' or financial liberalisation and deregulation. They have fixed or 'solidified' too many funds in ill-conceived construction 'investment' and have thus lowered the solvency of their credits. This is especially the case for Postal Savings (250 trillion yen) and other governmental financial institutions because public construction has been far less profitable and efficient than private construction. Now such projects cannot pay any interest more than 0.5 percent or so.

If the Big Bang should cause a money outflow of, for example, a moderate 100 trillion yen in search of an interest rate of 5 percent or so, Japanese banks would have to refund their best credits into cash or recall the drained money by paying a higher interest, i.e., costing over 5 trillion yen or one percent of the GDP. This would make an unbearable burden for Japanese financiers.

## Correlation of Public and Private Debt

### Public and Private Debts Combined by the Iron Triangle

Japan's construction industry comprises some 564,849 'companies' employing 6.85 million employees as of 31 March 1997. This industry uses more funds and more cement than its American counterpart although Japan's population and land area are, respectively, one half and one twenty-fifth of that of the US. The industry accounts for around 20% of the GDP (as against 10% in the US and the EU). In the mid-1990s, the industry was devouring public works expenditure of around 40 trillion yen per annum, or nearly 8% of GDP.

This industry, determined to defend its traditional privilege in the government budget, has formed a rigid union with politicians and

bureaucrats. The coalition is made up of the industrial troika of construction, finance and real estate, the ruling politicians, and the administrative bureaucrats, and has been called the 'Iron Triangle.'

This Triangle coordinates mutual interests as follows. The high-level bureaucrats provide development plans to the political bosses who, in return, secure necessary parliamentary consent. The ruling politicians, both governmental and municipal, in effect decide which constructors should gain the contracts. In return, the companies provide political funds and manpower for the election campaigns of their favourite politicians. The construction-related companies obtain insider information from the administrative officials and, in return, provide them with generous executive positions on their retirement.

The Iron Triangle stops at nothing to enlarge construction spending. In the midst of serious fiscal crisis, the national budget is wasted on unnecessary or even harmful developments, which also devastate the natural environment. Thus for example:

The Ministry of Agriculture spent 234 billion yen to reclaim 3,550 hectares of Isahaya Bay Coast (completed in 1997) for new rice fields. Meanwhile the same Ministry enforced a reduction of rice crop acreage by 175,000 hectares out of the nation-wide total of 963,000 hectares by the end of 1998-99.

The Ministry of Construction built Nagara River Estuary Dam at a cost of 150 billion yen. Nagoya City, although intended to be the largest customer, declined to buy any water and to pay its allotted charge. Yet the construction went ahead. The loss was covered by other municipalities, which accepted extra charges by further borrowing. Now the MOC is constructing another gigantic dam to supply more water for the same area, spending a further 254 billion yen. Such 'investments' are characteristic of large projects conducted by FILP agencies. Such public corporations act on behalf of the Iron Triangle. The Iron Triangle has successfully conspired to turn Japan's fiscal system into a fund-raising machine for the construction complex.

Why has such a self-destructive spending policy persisted? The Iron Triangle is mobilising public finances to rescue the debt-ridden tripartite

complex, justifying the policy in terms of 'economic stimuli and financial stabilisation'.

When the notorious Jusen problem was settled by the use of a 'public fund' of 685 billion yen at the end of 1995-96, most Japanese people angrily criticised the salvation. Yet few realised that the fund came not from tax revenue but from deficit-covering bonds. The Jusen 'settlement' was achieved partly by rolling over private liabilities to government debts. Does this really amount to settlement? Japan's fiscal policy since 1991 has served to transfer private liabilities in default to the public sector - effectively to nationalise bad loans. How far can the public finances bear this burden?

## Long-term Economic and Fiscal Trends

The long-term trend of Japan's GDP and main fiscal data is shown in Fig. 5. The history can be divided into three periods. The GDP growth rate was above 10% in Phase 1 (1960-1973), around 5% or more in Phase 2 (1974-1990), and around 1% or less in Phase 3 (1991-) (Kawamiya & Aoki, 1998).

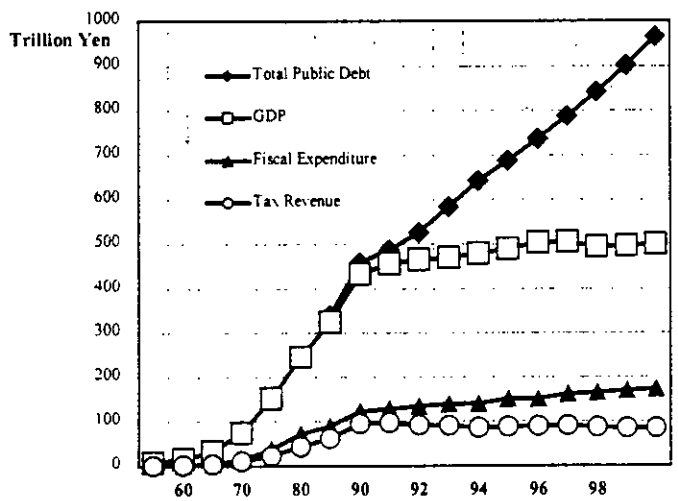
Until the mid-1970s the GDP reflected exponential growth. The vertical gap between the lines of the fiscal expenditure and of the tax revenue corresponds to the annual fiscal deficit.

In Phase 1 there were fiscal deficits, but they were promptly redeemed owing to the rapid increase in tax revenue. Because of the rapid growth in GDP and tax revenue, the fiscal deficit was not cumulative. Phase 2 set in after the first oil crisis of 1973, which ended the age of cheap resources and rapid growth. The government tried to raise the sagging growth rate by expanding the public works budget. Up to the late 1970s, this policy seemed reasonable because it served to construct useful infrastructure. However, the public construction investment did not decrease even after the main infrastructure was completed all over Japan. Instead, there occurred construction of 'extra-structure' - unnecessary roads, dams, dykes, tunnels, harbour facilities and so forth. Public works expenditure has long fallen prey to the Iron Triangle. Because of its

unlimited political power, it has deformed Japan's fiscal system irreversibly.

A serious problem in Phase 3 is that the total public debt has come to surpass the GDP and to 'grow' faster than the GDP itself. During the 1980s, for example, the annual increase of public debt was on average about 30 trillion yen, far exceeding the annual increase of Japan's GDP, i.e., 20-25 trillion. For financial years 1992-95 Japan's Government spent 67 trillion yen (13.4% of Japan's GDP) in stimulus measures. In 1998-99 the Government spent an additional 16 trillion yen (3.2% of GDP), with a similar outcome. Demand is created annually but debts accumulate perennially. Thus the public debt began to rise explosively since 1992. After four decades of rapid growth, Japan is sinking under a sea of bad debts in both public and private sectors. Japan's growth had been accelerated by debt-induced demand. It constitutes a prototype of the process of rapid growth and serious crisis in Asian countries.

**Figure 5: Japan's Fiscal data and Gross Domestic Product**




*Source*: Kawamiya & Aoki (1996b)

Nb. The data are nominal, and include a simple extrapolation to 2000-01.

What will occur at the final stage of debt-induced growth? Interest payments for the accumulated debt alone, not to speak of repayment of the principal, will exceed the annual growth of the economy. This will lead to general financial instability or even paralysis of financial systems, such as is already seen in Japan and many Asian countries.

A dangerous possibility at this stage is the call for 'creation of demand' and 'financial last resort', at the cost of new public debts. This is a dangerous option, because it would simply aggravate the financial instability unless it miraculously boosts growth up to a level sufficient to compensate for the raised debt payments. In fear of financial instability, the Japanese people are shifting their deposits further from commercial financiers to Postal Savings. However, these transferred deposits then flow into the FILP fund. Since 1992 the average annual increase of Postal Savings is 15 trillion yen (3% of GDP), which is much larger than the GDP increase (less than 1%). This flow will reinforce the Fiscal Triad and help the Iron Triangle to continue its fiscal squandering until the last minute of the nation's fiscal-financial breakdown (Kawamiya & Aoki, 1995).

Debilitated commercial banks cannot challenge this vicious circle because they themselves count on FILP money for relief financing. One of these relief measures is the Price Keeping Operation to support the stock market by using FILP funds, in which the participating FILP agencies have always suffered serious losses. The latest PKO of roughly 1.3 trillion yen was carried out in the late March 1998, resulting in a triple low of yen, stocks and government bonds. Is it possible to suddenly raise the growth rate at this stage of an economy? This question leads us to an investigation of the growth potential of the economy.

## Historical Change in Industrial Structure

### Three-Stage Transition in the Manufacturing Sector

Japan's economy used to be considered a 'model for rapid growth'. The electrical and electronic industry and the automotive industry were the

most innovative and cost-effective sectors. However, the fastest growing and the most influential industries in Japan were actually construction, real estate, finance and insurance, or their integrated complex. What they have historically amassed was not profits but non-performing debts, which terminated Japan's rapid growth and caused the prolonged and serious recession.

First we consider the historical trend of Japan's key material and manufacturing industries in the three-phase scheme introduced above (Kawamiya & Aoki, 1998). The phases suggest that the size of the economy in terms of material rather than monetary values has a tendency to saturate: a transition from growth to saturation seems more natural than limitless growth. This view is confirmed by the historical trend of key manufacturing industries.

For 1955-1973 (Phase 1) the steel and the automobile industries grew rapidly, from 9.4 million tons of steel and 69 thousand cars in 1955 to 119 million tons of steel and 6 million cars. These two industries well represented the fast growing trend of the material and the manufacturing industries in general. This phase was suddenly terminated at the first oil crisis of 1973, which heralded a severe recession that affected all the material industries.

Phase 2 began after the first oil crisis of 1973, which corresponds to the second stage of the fiscal succession. The Government tried to raise the sagging growth rate by enlarging the public works budget. Until the mid-1970s, this policy seemed reasonable, because it helped to build still insufficient infrastructures. However, the massive public construction works continued beyond a reasonable limit, resulting in the building of unnecessary roads, dams, dykes, tunnels, harbour facilities, etc. - in short, 'extra-structures'.

After 1974 the steel, cement and ceramic, petrochemical, and other material industries suffered a prolonged stagnation. The steel makers presumably regarded the stalemate as only temporary, so they tried to expand their production capacity during the 1970s. However, from around 1980, they finally had to shut down about one fourth of their facilities.

The automobile industry survived the oil shock and kept growing during Phase 2, mainly because Japanese subcompact cars were highly fuel-saving and became suddenly popular in the global market. In contrast to the auto industries overseas, the Japanese auto industry benefited unexpectedly from the sudden price hike of petroleum. From the mid-1980s, the information industry, with personal computer production playing the leading role, began to rise. As a result the growth rate of Japan's GDP gradually slowed, but it remained at a moderate level of roughly 5%.

Phase 3 was characterised by a sudden decline in the automotive industry: in 1990 the automotive production reached its peak, 13.5 million units, declining to below 10 million units in 1998. There is no sign of a rebound by May 1999. The car manufacturers instead made massive investments to expand production capacity by around three million units per year for 1988-1990. This miscalculation is reminiscent of the steel industry in the late 1970s.

The information industry seems to have failed to take over the role of leading industry from the automobile industry. The former had maximum sales of about six trillion yen (around US$50 billion) in 1991, which corresponds to only one seventh of the maximum automobile shipment in 1990 and is comparable with the sales drop of the auto industry (around 5 trillion yen between 1990 and 1994). The electronics industry itself suffered stagnation at the final stage of the bubble collapse in 1991, although it rebounded briefly owing to the sales of 'Windows 95' personal computers. However, the market size of the computer industry is far smaller than that of car industry. The process of popularisation and market saturation will be much faster than in the case of the auto industry. In addition the replacement demand will shrink with improved performance of existing computer models (Kayamiya & Aoki, 1998).

Thus Japan's GDP has remained almost constant since 1992, while public debt has been 'growing' annually by 30 to 40 trillion yen (6 to 8% of GDP). The growth-oriented policy has become economically irrational and unsustainable because it has raised public and private debt instead of the GDP. This outcome is inevitable and also natural, because Japan's population of senior citizens is going to increase and its basic social needs are shifting toward the requirements of a rapidly ageing society.

Japan's conversion from a 'construction state' to a sustainable society amenable to environmental concerns needs to be facilitated, for energy consumption, carbon dioxide emissions, and waste emissions be reduced. Japan now seems to have no alternative but to seek a really sustainable society.

## The Historical Trend of Shift within Industrial Structure

Whereas motorization and computerisation are the most conspicuous aspects of the present industrial society, ongoing economic change should be studied by a more structural analysis. Here we propose a 'five-sector analysis' instead of the traditional three-sector one, because the latter is too crude and inappropriate for a study of Japan's economy. Table 1 shows a breakdown of GDP by industrial sector. If we put the construction, the finance and insurance, and the real estate industries together this in sum denotes the share of the tripartite industrial complex in the nation's economy.

**Table 1: GDP Share by Industrial Sector in Terms of Value Added**

| Year | 1955 | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| Primary | 19.2 | 12.8 | 9.5 | 5.9 | 5.3 | 3.6 | 3.1 | 2.4 | 1.9 |
| Construction | 4.4 | 5.5 | 6.4 | 7.5 | 9.3 | 9.0 | 7.6 | 9.6 | 9.9 |
| Finance, Insurance & Immovables | 9.3 | 10.9 | 12.7 | 11.9 | 12.9 | 14.1 | 14.8 | 16.0 | 17.0 |
| Manufacturing & Mining | 29.4 | 35.3 | 33.7 | 35.7 | 29.6 | 28.7 | 28.7 | 27.1 | 23.9 |
| Commerce, Transportation & Communication | 27.1 | 26.0 | 27.2 | 29.9 | 31.0 | 32.0 | 33.1 | 33.3 | 34.7 |
| Governmental, Public utilities & NPO | 10.6 | 9.5 | 10.5 | 9.1 | 11.9 | 12.6 | 12.7 | 11.6 | 12.6 |

*Source*: Economic Planning Agency (1999)

The sum of rows 2 and 3 gives the GDP share of the tripartite complex consisting of construction, real estate, and finance. This complex has long been the fastest growing sector.

Table 1 shows that the most significant change is the mushroom growth of the construction / real estate/ financial complex which severely encroached on the primary industry and other sectors. It is a paradox that this fastest growing and dynamic sector piled up not profits but staggering losses, as was scandalously revealed in the 'Jusen' problem. The explosive development of this sector has been materialised by an explosive accumulation of financial liabilities. It was the lavish spending on debts that inflated the size of this industrial complex and its share in the national economy (*Ekonomisuto*, 1998). This unbearable contradiction finally caused the financial breakdown and the prolonged recession in Japan. Is it possible or reasonable to restore the economy by further funding this sector?

## International Comparison of Construction Industry's Weight in the GDP

Japan's construction industry has an extraordinary weight in the nation's economy, which has caused serious problems similar to those concerning the military industry in the former Soviet Union. The construction industry comprises about 20% of GDP. Gross construction investment *per capita* in Japan amounts to 660 thousand yen, compared to 250 thousand yen (US$2,200) in the USA in 1992. Investment per unit area in Japan is about forty times that of the USA whereas Japan's population density is roughly 13 times as large as that of the US. Japan's construction investment is too large compared to the GDP; the public sector is too dependent on debt, which is too concentrated on non-housing public works (Kawamiya & Aoki, 1998).

The problem concerning the excess of construction 'investments' is as follows: interest-laden 'investments' go not to infrastructure but 'extra-structures', of which only few people can make use. Such establishments bring no returns or social benefits, but require huge operational expenses and are likely to bring serious environmental destruction.

The repayment of principal and interest for the previous public 'investments' on debt is possible only through further borrowing, which

aggravates the fiscal deficits. Who needs such financially and environmentally destructive 'investments'? It is the general construction companies on the verge of bankruptcy; banks who gave them exorbitant credits; and politicians who exploit constructors and banks for political funding.

## Concrete Breeding Behemoth Crushing Ecosystem and Economy:

The vested interests of the Iron Triangle are vitally dependent on public works: the larger the budget is the more they can take. So they try to maximise 'public investments' beyond the proper societal needs by mobilising the Fiscal Triad of governmental, municipal, and FILP budgets. In Japan the public works budget is arranged in proportion to the presumed amount of concrete needed. Therefore budget maximisation results in maximisation of concrete consumption and, hence, of the resultant environmental destruction. These situations in concert bring forth a 'concrete breeding behemoth' fed on public finance, which causes damage both public-financial and environmental.

Unlike chemical pollutants, concrete is not poisonous but it cuts off the material and water circulation in nature and physically isolates the artificial space from the natural soil, water, and biological matrix. The 'behemoth' tries to pave every possible space with concrete by the use of seemingly unlimited funds supplied from the Fiscal Triad.

The most disruptive impact of the 'concrete breeding behemoth' is the isolation of water flow from the earth and its soil. Not only the urban areas but also rivers everywhere, even tiny mountain streams, are paved by a method called 'sanmenbari' (three-sided paving). This method paves the bed and both banks of rivers, thus isolating the water from the soil; annihilating aquatic plants and animals and, finally, turning rivers into simple water ducts without any aquatic biosphere and therefore any capacity to purify water. Even Japan's vast coastlines have become non-natural because of concrete embankment or tetra-pod setting, and tidelands have been extensively reclaimed all over Japan, locking out migratory birds.

To gain some sense of the environmental impact, we calculated the mass of concrete that has been stocked on the land surface of Japan from 1955 to 1995. The figure is 4.5 billion cubic metres, a volume sufficient to pave 12% of Japan's land surface with a thickness of 10 centimetres. The ecosystem and the economy of Japan are being buried beneath a thick layer of concrete on the one hand and of debt on the other (Ministry of International Trade and Industry, 1998).

## Conclusion

Financial crisis and environmental destruction in Japan have a common cause: excessive construction investments in both public and private sectors. This requires a simultaneous solution: a stop to debt-induced growth of the economy and of debt-financed destruction of the natural environment. Moves to create a society that is sustainable financially and environmentally must be taken. The dichotomy of 'either growth or the environment' is false.

We have shown that the cause of Japan's fiscal crisis is that the structure of the nation's public finance, the 'Fiscal Triad', is dangerously dependent on debt. The result is a rapid growth of the fiscal deficit, far ahead of the GDP in total amount and in rate of expansion.

Second, analysis of the financial disaster in the private sector shows that this crisis is due to the tripartite complex of construction, finance, and real estate running amok financially. This complex is the fastest growing and thus the largest sector in Japan and the world, and it has accumulated not profits but losses.

Third, the crises in the public and the private sectors have been driven by the same political-economic system - the Iron Triangle, comprising politicians, bureaucrats and financiers. The Triangle makes use of the Fiscal Triad, nominally as part of the process of stimulating growth but actually as a last resort to cover the catastrophic losses of the tripartite complex. This will further inflate the balance of Fiscal Triad debt beyond the present 769 trillion yen; eventually it will become impossible to contain.

Fourth, the historical transition of Japan's industrial structure shows a clear trend towards saturation. The Japanese economy has to change its orientation from growth towards sustainability. The nation's economy has no capacity to absorb further imports as requested from overseas unless there is a corresponding reduction in the domestic product.

Fifth, the present ill-conceived institutions leads to a maximisation of the construction budget, of concrete consumption, and finally, of environmental destruction.

## References

AERA (1998) [weekly periodical of the *Asahi Shimbun Weekly*], 6 April.

Budget Committee of the House of the Representative (1999), *Zaisei Kankei Siryou Syuu* (Data Book on Public Finance)

Economic Planning Agency, *Kokumin Keizai Keisan Nenpou* (Annual Report on National Account), various years.

*Ekonomisuto* (Weekly Economist) (1998), Feature Articles on: Zenekon '5 Gatu Kiki' ('May Crisis' of General Construction Companies), 7 April [published by Mainichi Shimbun Sha].

Kawamiya, Nobuo & Aoki, Hidekazu (1994), "Nihon "Doken Kokka Ron" (Study of Construction State Japan), *Chukyo Daigaku Kyouyou Ronsou*, Vol.35, No.1.

Kawamiya, Nobuo & Aoki, Hidekazu (1995), "Akuzyunkan suru Kinyuu Kiki to Zaisei Kiki" (Japan's Financial and Fiscal Crisis in Vicious Circle), *Chukyo Daigaku Kyouyou Ronsou*, Vol.36, No.2.

Kawamiya, Nobuo & Aoki, Hidekazu (1996a), "The Economic, Technological and Environmental Sustainability - What Impairs it and How to Repair It." IUPAC (International Union of Pure and Applied Chemistry): CHEMRAWN IX, (Seoul, Sept. 1-6, 1996), The Proceedings of 'World Conference on The Role of Advanced Materials in Sustainable Development, p.541ff.

Kawamiya, Nobuo & Aoki, Hidekazu (1996b), "Kokumin Keizai Keisan no Hihanteki Kousatu" (Critical Treatise on National Economic Accounting), *Chukyo Daigaku Kyouyou Ronsou*, Vol.37, No.3.

Kawamiya, Nobuo & Aoki, Hidekazu (1997), "Zikozousyoku suru Kin'yuu Husai" (Self-Breeding Financial Liabilities in Japan), *Chukyo Daigaku Kyouyou Ronsou*, Vol.38, No.2.

Kawamiya, Nobuo & Aoki, Hidekazu (1998), "The Fiscal and Financial Crisis in Construction State Japan-Any Way Out?" *Selected Papers on Entropy Studies* Vol. 5, No. 1.

Ministry of International Trade and Industry (1998), *Namakonkurito Toukei Nenpou* (Annual Report on Ready Mixed Concrete).

Miyawaki, Atusi (1995), Zaisei Touyuusi no Kaikaku (Reform of Treasury Investments and Loans), *Touyou Keizai Sinpou Sya*.

Miyawaki, Atusi, Zaisei Touyuusi no Kaikaku (Reform of Treasury Investments and Loans), *Touyou Keizai Sinpou Sya* (1995) p. 180ff

Seidman, L. William (1996), "Lessons from the Rebirth of Financial Institutions in USA", *Kin'yuu Journal*, Dec., p.66.

Teikoku Databank (1999), in *Nihon Keizai Shinbun* April 15.