The Fiscal Investment and
Loan Program in Transition

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Abstract

This paper discusses the adequacy of the activities of the Fiscal Investment Loan Program agencies after the fundamental reform in April 2001, which disconnected postal savings and public pension reserves from the FILP. It is found that many ideas of justifying the government interventions to the financial sector have now lost their relevancy. The activity of government financial intermediaries should be streamlined. Among infrastructure construction projects, the most serious part of welfare loss lies on national motorway construction, which is estimated to be about 14.5 trillion yen of welfare loss.

Keywords: Fiscal Investment and Loan Program, government bank, expressway construction.
JEL classification numbers: H81, H54, R42

1. Introduction

The Fiscal Investment and Loan Program (FILP, *Zaisei Toyushi*) represents a common problem that the Japanese economy faces. A system that has worked very well in a post-war reconstruction period stumbled in the current time. The system has to be changed so that it fits the well-developed market economy.

The FILP is a kind of government interventions to the financial sector. When the financial sector were not well developed, the role of the FILP was significant. However, as the private financial activities has developed, the role of the government is supposed to be scaled down. Actually, the size of the FILP had grown steadily. Table 1 shows the total new lending of the FILP since the Fiscal Year 1953, when the first FILP plan was assembled. At the peak of nominal values, the new lending of the FILP reached 40.5 trillion yen in 1995[1]. The ratio to GDP had grown from 3.7 percent in 1955 to 8.2 percent in 1994.

The size of the FILP has then declined dramatically since 2000. In FY 2002, it decreased to 26.8 trillion yen by 44 percent from the level of FY 1999. Although aggressive fiscal expansions had partially contributed to the peak in the 1990s, another important reason of the decline is a response to recent criticisms towards the FILP that was suspected of outgrowing its policy purposes. The Japanese policy makers conducted the "fundamental reform of the FILP" in April 2001 that introduced a new scheme into the FILP. This was a first step to the further reforms. In December 2001, the Koizumi administration assembled an action program of reforming special public institutions (*tokushu hojin*). Since the majority of agencies that are affiliated with the FILP are special government institutions, the shape of the FILP would be influenced substantially by the reform plan.

With these reforms, the FILP will enter a new ear of its business, and the landscape of research on the FILP has dramatically changed. While there are many important studies on the former scheme of the FILP, an attempt to reexamine the role and performance of the post-reform FILP scheme is very rare. One important exception is Doi and Hoshi (2002), who estimated that the bad loans of the FILP would cost at least

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[1] This is general FILP (*ippan zaito*), which excludes the dicretionary investment of Postal Savings and Public Pension Reserves.

Table 1: The Fiscal Investment and Loan Program, 1953-2002

Fiscal year	(A) FILP (trillion yen)	(B) GDP (trillion yen)	(C) (A)/(B) (percent)
1953	0.3		
1955	0.3	8.6	3.7
1960	0.6	16.7	3.6
1965	1.6	33.8	4.8
1970	3.6	75.3	4.8
1975	9.3	152.4	6.1
1980	18.2	245.5	7.4
1985	20.9	324.3	6.4
1990	27.6	438.8	6.3
1991	29.1	463.2	6.3
1992	32.3	471.9	6.8
1993	36.6	476.7	7.7
1994	39.4	478.8	8.2
1995	40.2	489.7	8.2
1996	40.5	504.4	8.0
1997	39.3	507.6	7.7
1998	36.7	497.3	7.4
1999	39.3	493.9	8.0
2000	37.5	490.1	7.6
2001	32.5		
2002	26.8		

Note: FILP is the planned amount of new lending. GDP is based on 63SNA, which spans from 1955 to 2000. Since the Japanese SNA has changed to 93SNA in 2000, currently no GDP series cover the whole periods.

78.9 trillion yen. While their stunning number reveals the burden already created by the past inappropriate activities of the FILP, the present paper will address how we will suffer from the future inappropriate FILP activities, which is avoidable if we make a wise decision.

The organization of this paper is as follows. In Section 2, the paper outlines the recent reform movements surrounding the FILP, and discusses the underlying economic ideas.[2] Since the FILP in the current time has grown excessively, downsizing the FILP is a right move. Section 3 discusses reasons of why government interventions to the financial sector are needed. Many ideas of justifying the interventions lost its relevancy under the well-developed financial sector. Remaining relevant reasons are risk bearing of large projects and remedying credit rationing. Based on these observations, the role of government financial institutions will have to be reexamined and streamlined. Section 4 picks up the expressway construction project of the Japan Highway Public Corporation, which is the largest among agencies engaged in public works. Even with very optimistic assumptions, its future welfare loss is estimated to be more than 14.5 trillion yen. Section 5 poses concluding remarks.

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[2] Other papers, which discuss recent issues of the FILP, include Cargill and Yoshino (1999, 2001) Doi and Hoshi (2002), and Ishi (2000, Chap. 12).

2. The Fundamental Reform of FILP in 2001

2.1 Characteristic of the Fundamental Reform of 2001

The basic structure of the FILP before the 2001 fundamental reform had consisted of three parts (entrance, mid, and exit) since the term of "Fiscal Investment and Loan Program" first appeared on the FY 1953 Budget. The entrance side of the FILP was central government's special accounts that had a financial surplus. Among them postal savings and public pension funds had a large share. Postal savings, pension funds and other special accounts were obliged to deposit their money in the Trust Fund Bureau of the Ministry of Finance. The Trust Fund Bureau allocated the money among the exit side (a variety of special accounts and special public institutions).
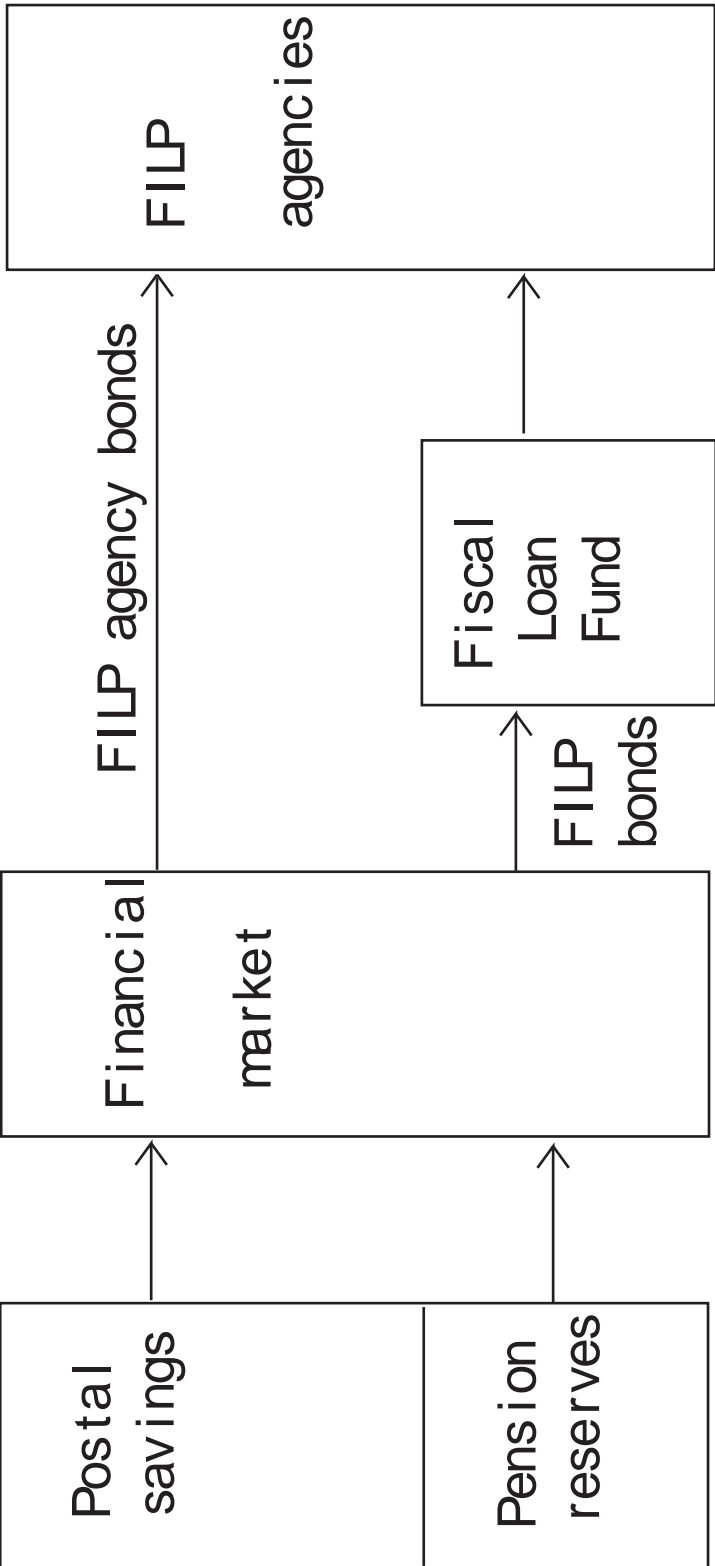
The 2001 Reform derived three major changes in the former scheme (The streamlined money flow under the post-reform FILP is represented as Figure 1).

(1) Disconnect the postal savings and public pension reserves.

Before the fundamental reform, main financial source of the FILP was postal savings and public pension reserves. The 2001 reform disconnected them from the FILP. The following two problems motivated this change.

The first was the size of the FILP. The Japanese financial system has achieved a significant progress since the launch of the Trust Fund Bureau. As the private activity is developed, the role of government intervention is likely to be restrained. However, the size of the FILP has actually grown as shown in Table 1. The growth of postal savings and public pension reserves can be considered as one of reasons of the FILP growth, because the former FILP scheme connected the entrance side and the exit side through the Trust Fund Bureau. Since the Trust Fund Bureau's purchasing Government Bonds works as a buffer, the size of the entrance and exit sides does not necessarily coincide year by year. In the long run, however, the both sides had grown in parallel. Since the FILP agencies and the entrance side of the former FILP have a different policy purpose, there is no guarantee that their optimal sizes are the same. If the growth of the entrance side forces the exit side to follow, FILP agencies become excessively large. The oversized public sector will be engaged in two harmful activities. One is an activity that the private sector can do; the public sector and the private sector thus compete each

Firure 1: The Post-ReformFILP System

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┌─────────────────┐                    ┌─────────────────┐
│ Postal          │                    │ Financial       │
│ savings         │ ─────────────────► │ market          │
├─────────────────┤   FILP agency bonds│                 │────┐
│ Pension         │                    │                 │    │ FILP agency bonds
│ reserves        │ ─────────────────► │                 │    │
└─────────────────┘   FILP bonds       └─────────────────┘    │
                                              │                ▼
                                              │         ┌─────────────────┐
                                              ▼         │ FILP            │
                                       ┌──────────┐     │                 │
                                       │ Fiscal   │ ───►│ agencies        │
                                       │ Loan     │     │                 │
                                       │ Fund     │     └─────────────────┘
                                       └──────────┘
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other. The other is an inefficient or wasteful activity. By disconnecting postal savings and public pension reserves from the exit side of the FILP, the size of FILP agencies can be determined based on their own policy purposes.

The second problem was that the huge money had flowed inside the government from the entrance side to the exit side. The government determined the FILP interest rates faced by the entrance and exit sides, and there was no guarantee that they track the market interest rate.[3] A discrepancy between the market interest rate and the FILP interest rate sometimes caused a serious problem. When the FILP interest rate is higher than the market interest rate, postal savings can collect money by offering a generous interest rate. Since the downward adjustments of the FILP interest rates tend to be slow, postal savings expanded when the market interest rate declined sharply. When the FILP interest rate is lower than the market interest rate, government financial institutions can deprive private banks of good borrowers. With the 2001 reform, the huge money flow inside the government was replaced by the transactions in the capital market.[4]

(2) FILP agency bonds

Since the entrance side of the FILP will be no longer a major supplier of funds, the exit side now has to finance money from the capital market. The intensively debated issue in shaping the post-reform FILP scheme was how to finance the funds that FILP agencies need. There are three options. One is the FILP bond, which is a bond that the newly formed Fiscal Loan Fund issues.[5] Since the government backs its redemption, investors think it is equivalent to the Japanese Government Bond. The second option is a government guarantee of loans or bonds. While the safety of the government

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[3] See Fukao (1998) for further discussion of this issue.

[4] Strictly speaking, only new money from postal savings and public pension reserves were disconnected from the FILP. The existing stock of their deposit will remain in the new Fiscal Loan Fund, until the deposit term ends. Therefore, the stock adjustment process will be gradual. In addition, if postal savings and public pension reserves turn new money into the purchase of FILP bonds or Government Bonds, money flow will not change very drastically. Indeed a massive shift of money flows in the capital market did not occur after the 2001 reform. For further discussion of these issues, see Cargill and Yoshino (2001).

[5] The Reform Act nominally abolished the Trust Fund Bureau, and created the Fiscal Loan Fund. But, it effectively only renamed the central part of the FILP, because all assets and liabilities of the old Fund were transferred to the new Fund.

guaranteed bonds is the same as the government bond, they pay a small amount of liquidity premium. The last is FILP agency bonds that FILP agencies issue without a government guarantee. Since they contain a default risk, bondholders should monitor FILP agencies carefully. Hoping that FILP agency bonds help to governing FILP agencies, some experts strongly advocated introducing FILP agency bonds.

The 2001 Reform plan suggested that FILP agencies should consider FILP agency bonds first as a way of finance. At the first year of the launch of FILP agencies, however, FILP agencies planned to finance only 3.3 percent of the FILP size (1.1 trillion yen) through FILP agency bonds. The actual finance through FILP agency bonds became even smaller by 100 billion yen than planed. In FY2002 Budget, the amount of FILP agency bonds is expected to be 2.7 trillion yen (10.1 percent of the total FILP plan).

Will the FILP agency bonds indeed help to discipline FILP agencies? A serious problem for the function of the FILP agency bonds is that if the government is expected to bail out a failed FILP agency, the monitoring by bondholders does not work well. Although the bailout is not explicitly stated, the government may have incentives to bail out a failed FILP agency *ex post*. No explicit efforts for the government to commit not to bail out have been made. The FILP agency bonds so far get a high rating that is almost equivalent to that of Japanese Government Bond. This fact implies that the market expects an "implicit governmental guarantee." The initial intention of introducing the FILP agency bonds turned out to be less functioning.[6]

(3) Subsidy cost analysis

The newly established Fiscal Loan Fund allocates funds among 43 institutions in FY 2002. The largest borrower is local governments, which plan to borrow 7,600 billion yen (25.5 per cent of total lending). Four special accounts of national government borrow funds from the FILP. The remaining is special public institutions called FILP agencies. One type of them is government financial institutions. They make loans to the private sector that is difficult to borrow money from financial markets or private financial intermediaries.[7] The other type of FILP agencies performs public works.[8]

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[6] For more theoretical discussion of FILP agency bonds, see Iwamoto (1998). Doi and Hoshi (2002) assessed the first year experience of FILP agency bonds issuance.

[7] Targets of government financial institutions are very wide. The Government

Table 2 lists major 15 FILP agencies and their new borrowing from the FILP in FY 2002. Their borrowing accounts for 96.4 percent of FILP loans excluding the local governments. 8 agencies are government financial institutions, and 2 (Social Welfare and Medical Service Company and Japan Scholarship Foundation) are engaged mainly in loan businesses. 4 agencies are for expressway construction. 1 is for real estate and businesses. While the remaining activities span very widely, this paper will focus mainly on the current major activities, which are government financial institutions and expressway construction.

How much do inefficient activities of oversized FILP cost our economy? The government made some attempts to quantify policy costs of the FILP. As one attempt for this direction, the government introduced "subsidy cost analysis" in 1999. The subsidy cost analysis estimates the present discounted value of the future stream of the cash transfers by the government under the assumption that FILP agencies do not launch a new project. Table 2 also presents the estimates of subsidy costs of large agencies. Japan Highway Public Corporation and Urban Development Corporation have a huge amount of subsidy costs, whose sum is 2.9 trillion yen.

In 2001, the Ministry of Finance started another attempt to further disclose the status of FILP agencies by requiring that special public institutions disclose a richer content of financial statements that adhere recent developments of accounting standards.[9] At the same time, special public institutions were required to calculate "policy cost," which represents government's expenses to the activities of special public institutions. It includes the opportunity costs of government capital and depreciation allowances of real capital in addition to explicit government subsidies, while operating surplus is deducted.

Housing Loan Corporation lends money to homeowners. National Life Finance Corporation, Japan Finance Corporation for Small Business, and the Shoko Chukin Bank lend money to small and medium-sized businesses. Development Bank of Japan lends money to big projects. Agriculture, Forestry and Fisheries Finance Corporation specialize in the loan to farmers and fishermen.

[8] Major areas of activities are expressway construction (Japan Highway Public Corporation, Metropolitan Expressway Public Corporation, Hanshin Expressway Public Corporation), airports (Special Account for Airport Development, New Tokyo International Airport Authority, Kansai International Airport), water supply and sewers (Water Resources Development Public Corporation, Japan Sewage Works Agency) and regional development (Japan Regional Development Corporation) among others.

[9] However, in general, the reform of public sector accounting is still behind the trend in other developed countries.

Table 2: Major FILP Agencies (Fiscal Year 2002)

(billion yen)

	New lending	FILP agency bonds[1]	Subsidy costs[2]	Subsidies[3]	Policy costs[4]	Proposed reform[5]
Local governments	7,600					
The Government Housing Loan Corporation	4,967	600	-435	376	433	abolish
National Life Finance Corporation	3,530	200	18	28	115	
Japan Highway Public Corporation	2,118	400	1,794	0	-294	privatize
Japan Finance Corporation for Municipal Enterprises	1,532	220	9	0	-192	
Japan Finance Corporation for Small Business	1,371	200	77	23	104	
Japan Bank for International Cooperation	1,287	200	543	219	-39	
Development Bank of Japan	910	200	132	52	-9	
Urban Development Corporation	895	50	1,118	77	636	abolish
Metropolitan Expressway Public Corporation	462	30	359	45	22	privatize
Social Welfare and Medical Service Corporation	359	20	61	34	47	agency
Hanshin Expressway Public Corporation	358	20	259	17	47	privatize
Japan Scholarship Foundation	222	56	119	113	79	agency
Agriculture, Forestry and Fisheries Finance Corporation of Japan	208	22	413	87	72	
The Okinawa Development Finance Corporation	187	10	12	7	7	
Honshu-Shikoku Bridge Authority	104	0	661	233	141	privatize

Notes: 1) Planned new issue.

2) Subsidy costs are the discounted present value of subsidies that are attributed to the existing activities of the FILP agencies. See section 2.1(3).

3) Subsidies from the national government budget.

4) Explicit subsidies from the national and local governments plus implicit subsidies (opportunity cost of investment of governments) minus operating surplus. Numbers are for FY 2000.

5) Reform Plan of Special Public Corporations (December 2001). Reforms of government financial institutions are pending.

Table 2 also reports the policy costs in FY 2000 and subsidies from the national government in FY 2002.

Subsidy cost, subsidies, and policy cost are not directly comparable, because they take a different approach to measuring burdens. While the subsidy cost is the discounted present value, the others are annual flow. Policy cost reflects the profitability of operation, but subsidies do not take account of it.

The budget expenses or the policy costs do not necessarily result directly in a social waste if the subsidized activity creates enough social benefits. Moreover, these numbers unfortunately do not capture the possible burdens of the future projects, which may be a significant part of the welfare costs of excessive FILP activities. There are three types of welfare costs of inappropriate FILP projects.

First, when the public sector substitutes the activities of the private sector and operates inefficiently, the inefficiency will be the welfare costs. Although many researchers compared the operation efficiency of government financial institutions with private banks, they did not get secure evidence that the performance of the public sector is inferior (For example, see Yoshino, 1994). This is perhaps because the private banks operated inefficiently due to the fact that government policies had restrained competition among private institutions.

The second type of welfare costs is a distortion caused by government subsidies. If the government subsidies remedy market failures or some distortions appropriately, they do not bear welfare losses. If the government subsidies are not based on a sound policy purpose, however, resources will be shifted to targeted activities, exceeding an appropriate level. To evaluate this type of deadweight loss, we need to know the adequacy of subsidies and the interest rate elasticity of demand for loans. Since the adequacy of subsidies is very difficult to determine, existing researches did not give us a definite answer.

The third type of welfare costs is money lost by inefficient or inadequate activities such as non-performing loans for government financial institutions and underutilized infrastructure for public works. When the government financial institutions were required to disclose policy costs, the information of non-performing loans was also disclosed. At the end of March 2001, the sum of non-performing loans of 8 government financial institutions amounted to 5.1 trillion yen. The loan loss reserves were 2.1

trillion yen. Doi and Hoshi (2002) pointed out that the government financial institutions did not deduct enough reserves. They estimated that the under-reservation of FILP agencies (including loans made by non-financial institutions) was 3.2 trillion yen.

Underutilized infrastructure can be another serious source of social waste, too. I suspect the most serious part of welfare costs lies on the national motorway (*kosoku jidosha kokudo*) construction program of the Japan Highway Public Corporation, which will be discussed further in Section 4.

2.3 Reforms of Special Public Institutions

The 2001 Reform did not solve all problems in the FILP. Particularly, how to further discipline FILP agencies is an important remaining problem. A next step of the reform has to address how to reform the FILP agencies.

The Japanese government is now engaging in the reform of special public institutions. The Cabinet set the Gist of Public Administration Reform in December 2000. The Administrative Reform Promotion Secretariat was set up in January 2001, and was in charge of making the Action Program of Special Public Institutions Reform by the end of 2001. Since many special public institutions are FILP agencies, this reform will give a significant impact on the future shape of the FILP.

In December 2001, the Administrative Reform Promotion Secretariat finalized the Action Program. The program determined eight FILP agencies (four highway-related agencies, Japan Environment Corporation, Teito Rapid Transit Agency, New Tokyo International Airport Agency, and Kansai International Airport Co.) would be privatized. Since the FILP does not target private companies directly, a privatization implies a spin-off from the FILP. The plan also determined that among the agencies listed on Table 2, the Government Housing Loan Corporation and Urban Development Corporation would be abolished.[10] Since the plan decided that the Government Housing Loan Corporation would cease loan business, their borrowing is expected to decrease substantially in the near future. If these ten agencies left the FY2002 FILP plan, its total

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[10] Since a new agency (*dokuritsu gyosei hojin*) will take over the business of an abolished institution, the abolishment of some institutions does not necessarily lead to the spin-off from the FILP.

Among the agencies listed in Table 2, Social Welfare and Medical Service Corporation and Japan Scholarship Foundation will be transformed to an agency.

size would have been decreased by 9.0 trillion yen (about 33.5 percent of the FY 2002 FILP plan).

The reform plan of government financial institutions except the Government Housing Loan Corporation was not finalized by the deadline of the Reform Plan in December 2001, due to a strong conflict with an opposing group of the ruling party. The Council for Economic and Fiscal Policy then took over the job of assembling a reform plan by the end of 2002.

3. Government Financial Institutions

3.1 Six Reasons of the Purpose of Government Interventions to the Financial Sector

The loan made by government financial institutions exceeds more than 20 percent of total loans. To discuss why such a high involvement is needed, this subsection will examine reasons that call for the government interventions in the financial sector. We will review six major reasons that have been pointed out in the existing literature. My assessment is the following; the first four is no longer valid under the well-developed financial system. The last two remain valid. We, therefore, need to reexamine and streamline the current activities of government financial institutions under the new economic conditions.

(1) promotion of competition

Due to a heavily regulated environment, the Japanese financial institutions were operated inefficiently. One of the reasons supporting the government financial institutions is that its presence creates a competitive pressure to the private banks. As criticized by Ikeo (1998), however, a real problem is that the government fails to provide the competitive environment that promotes the efficiency of the private financial sector. Deregulation of the financial sector is a more appropriate policy choice.

(2) production of information

The information production of the financial intermediaries consists of screening (before making a loan) and monitoring (after making a loan). Since government financial institutions do not offer a cashing deposit account, they do not have an advantage of monitoring. It is unconvincing to simply say that government financial institutions have a superior screening ability. Thus the information production role of government financial institutions is severely limited.

One possible exception is the story of Higano (1986) that the former Japan Development Bank[11] created some information because they had a strong tie with the policy makers, particularly, the former Ministry of International Trade and Industry.

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[11] It was renamed the Development Bank of Japan in 1999, when it merged with the Hokkaido-Tohoku Development Finance Public Corporation.

This story has lost a relevancy in the current Japanese economy, where the government no longer has advantage of finding leading industries. The role of the Development Bank of Japan is no longer important for the Japanese economy.

(3) asset transformation

Providing long-term funds with a fixed interest rate has been a major purpose of government interventions. When private financial intermediaries cannot change short-term deposits to long-term loans, the government is supposed to be able to bear interest rate risks. However, officials at the Trust Fund Bureau state that they do not bear interest rate risks because they conduct a well functioning Asset Liability Management. [12] If so, the current provision of long-term loans is a result of sophisticated asset management that is manageable also by the private sector. Thus government interventions are unnecessary for this purpose.

(4) externality

When the investment project creates the return that is not collectable by the investor, under-investment of such a project may occur. However, the direct remedy is to give subsidies to such a project. The government sector does not have to be involved further.

(5) risk bearing

The government can bear a very large risk that the private sector cannot, because the government can spread the risk over the whole taxpayers. The FILP thus may be suitable for performing a large project that contains a very large risk. However, we are cautioned that the ability of distributing burdens itself implies that it is very difficult for taxpayers to effectively monitor the risk-bearing behavior of government because a small pain of each taxpayer is not likely to exceed monitoring costs. How to govern the risk bearing of the FILP is a serious issue, which is not yet resolved.

(6) asymmetric information

The credit market is a typical example where a problem of asymmetric information prevails. Even if the government faces the same information constraint with the private sector, there is a possibility that the government can improve welfare (Mankiw, 1986). This story justifies government interventions in the credit market for small businesses, while we lack enough empirical support concerning the current activities of the FILP agencies, like National Life Finance Corporation, Japan Finance Corporation for Small

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[12] Takahashi (1998) made this point.

Business, and the Shoko Chukin Bank.[13]

3.2 Why Direct Loans by Government Financial Institutions?

Japanese FILP relies heavily on direct loans. We will examine relative performance among alternative measures of interventions (interest subsidies and loan guarantee).

One role of government financial institutions is to make a loan with the interest rate below the market rate. The gap is financed explicitly through subsidies and implicitly through government guarantee of liabilities. We have to carefully examine whether subsidies to private institutions can do the same job.

Why do we need an institution that is not private? Some incompleteness of contracts is considered to be an answer.[14] When the government writes a contract that completely describes policy purposes, the government can delegate a necessary loan business to a private financial institution. When the policy purpose is very complicated to write down on a contract, a proper execution of public policy becomes difficult. There are also other types of agency problem. Suppose that a government loan program contracts with a private financial institution to do loan business of the program. When the government has a right to decide whether loan should be made, the private institution worries that the proposal of loan will be turned down by the government, and does not devote enough of their resources to the government program. When the government in turn delegates the decision-making of loans to private institutions, there is another possibility of agency problem; they might lend good borrowers their own fund and apply the government program to bad borrowers.

If the resultant inefficiency is serious, the government may prefer to own an

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[13] Some empirical studies examined whether there are rationing in the credit market. Matsuura, Mitsui and Kitagawa (1991) conducted an empirical test of credit rationing using a test of disequilibrium with an explicit consideration of government financial institutions. They found that while the market of general banking loan is at disequilibrium, the market of small businesses and mortgage is in equilibrium. Since their framework does not focus on the credit market under the absence of government interventions, the role of government interventions cannot be examined. While the asymmetric information story suggests the possibility that the government may play an important role in small business loans, more careful researches would be called for.

[14] For general discussion of the choice between a government enterprise and a private firm, see Sappington and Stiglitz (1987) and Hart, Shleifer and Vishny (1997).

institution that they can control directly.[15] When these problems are small, the government does not have to rely on a governmental financial institution. Interest subsidies or a loan guarantee can perform a necessary job.

The area where problems of incomplete contract are likely to be small is a mortgage loan. Since a financial intermediary handles a huge number of mortgage loans, the policy purpose cannot depend on individualistic factors. Since the securitization of mortgage has been developed in the United States and other countries, information production and financing can be successfully separated in the area of mortgage loan. Therefore, the role of Government Housing Loan Company should be shifted to securitize their loans and promote the secondary market for mortgages. The necessity of direct loan has become small.

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[15] Kaizuka (1981), Iwata (1988) and Ide and Hayashi (1992) discuss the necessity of direct loan by government financial institutions.

4. Welfare Costs of Expressway Construction

4.1 Financial Conditions of the Japan Highway Public Corporation

Policy debates in 2001 and 2002 have been heated on expressway constructions. The national government currently has a plan to build the expressway network of about 14,000 kilometers nationwide. The Japan Highway Public Corporation (JH) is in charge of constructing 11,520 kilometers of national motorways and 2,300 kilometers of regional motorways (*ippan yuryo doro*), and Honshu-Shikoku Bridge Authority is in charge of constructing the remaining 180 kilometers. The initial plan of national motorways in 1966 was to construct 7,600 kilometers. In 1987, construction of 3,920 kilometers was added into the revised plan. As of the end of March 2001, 6,851 kilometers has been opened.[16] Other 2,491 kilometers has been included in the construction plan (*Seibi Keikaku*), which finishes environment impact assessment.

The Japanese government decided to finance construction costs of these roads by toll revenues, while there has been a small share of subsidies to the construction. Four highway-related agencies borrow construction costs from the FILP, operate toll roads, and repay construction costs by toll revenues. When the first motorway, Meishin line, opened in 1963, its construction costs were expected to be fully repaid in 30 years. In 1972, JH, however, started to pool toll revenues of all national motorways for repaying their debt. Thus, after an old line finished to repay full of its construction costs, it has to contribute to repay debts of newer lines and has never become free.

The current financial conditions of JH appear to be healthy. Since toll revenues (1.87 trillion yen in FY 2000) exceed the sum of operating costs (369 billion yen) and interest payments (576 billion yen), the national motorways in the current time appear very profitable. Net policy costs in FY 2000 (the latest available data) was minus 294 billion yen.

However, a hidden problem is that the profitability varies widely among lines. Table 3 presents a measure of the "rate of return" of each line in FY 2000, using the information reported in the Annual Report of JH. The rate of return is obtained as

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[16] At the writing of this paper, the most recent Annual Report of JH was for FY 2000, which ends March 2001. Since much of information used in the present paper is taken from the Annual Report, I focus on the decision-making at the end of March 2001.

Table 3: Rates of Return of National Motorways by Line (Fiscal Year 2000)

Lines	Length in operation	Opening rate	Book value of road	Operating surplus	Rate of return	Welfare gains
	(kilometer)	(percent)	(billion yen)	(billion yen)	(percent)	(billion yen)
Do-o	349	73	1,007	18	1.76	-565
Sapporo, Doto	131	32	365	6	1.70	-210
Tohoku, Tokyo Gaikan	698	100	2,126	188	8.83	2,567
Hachinohe	68	70	212	2	0.94	-162
Akita	123	74	345	3	0.90	-267
Yamagata	125	91	481	3	0.69	-398
Banetsu	213	100	752	11	1.50	-469
Kanetsu	246	100	1,394	81	5.78	619
Joshinetsu	203	100	1,205	27	2.27	-522
Joban, Tokyo Gaikan	200	64	1,161	69	5.95	566
Tateyama	35	64	338	9	2.63	-116
Higashi Kanto	75	67	400	46	11.51	750
Shinkuko	4	100	4	0	9.52	6
Kita Kanto	55	41	373	1	0.35	-341
Fuji Yoshida	94	100	373	42	11.31	682
Chuo, Meishin	462	99	1,948	195	9.98	2,914
Nagano	76	100	527	17	3.30	-92
Tomei	347	100	1,539	231	15.01	4,237
Tokai Hokuriku	145	78	886	6	0.70	-731
Daini Tomei	5	2	161	0	0.00	-161
Hokuriku	487	100	1,852	67	3.63	-169
Ise	69	100	203	11	5.57	80
Meihan, Kinki	137	88	978	91	9.32	1,300
Daini Meishin	5	3	58	0	0.17	-55
Hanwa	73	36	456	25	5.55	177
Maizuru	87	54	324	6	1.82	-176
Kansai Kuko	7	100	156	1	0.45	-139
Chugoku Jukan	543	100	1,245	66	5.27	395
Sanyo	445	100	2,853	108	3.78	-158
Okayama, Yonago	107	96	355	4	1.15	-253
Sanin	14	10	52			
Hiroshima, Hamada	71	100	176	3	1.76	-98
Matsuyama, Tokushima	222	100	1,107	16	1.44	-709
Takamatsu, Kochi	155	55	828	12	1.42	-533
Kyushu	345	100	1,132	89	7.85	1,090
Miyazaki	83	100	153	6	3.59	-16
Kanmon	9	100	41	4	9.69	59
Nagasaki, Oita	246	88	1,050	33	3.15	-222
Higashi Kyushu	38	12	151	0	-0.07	-154
Okinawa	57	100	217	7	3.27	-40
Total	6,851	73	28,982	1,505	5.19	8,685

Notes: 1) Length in operation, opening rate, book value of road, and operating surplus are taken from Annual Repot 2001, Japan Highway Public Corporation. The operating surplus is toll revenues minus operating costs. Rate of return is the operating surplus devided by the book value of load. Welfare gains are the product of the book value of road and (the rate of return - 4 percent) / 4 percent.

2) Annual Report 2001 of Japan Highway Public Corporation does not report the operating records of Sanin Line. The report does not think they are informative, because Sanin Line opened very late in FY 2000.

operating surplus (toll revenues minus operating costs) divided by the book value of roads. This measure helps to judge whether an expressway line can repay its construction costs. If this rate of return falls short of the interest rate, the construction cost will be hardly repaid.[17]

Since underutilization of motorways is easy to notice when one drives down the road, experts and media have recently become skeptical about the solvency of JH, which continues to construct unprofitable lines. However, the solvency is not a single problem in business of JH.

Table 3 indicates that although old lines, which have a high opening rate, achieve a very high profitability, the rates of return to newer lines are quite low. Expressway construction obeys the rule of diminishing return; the newer the time of construction is, the less the traffic is. Since JH pools all toll revenues, a significant cross-subsidization occurs inside. Chuo, Higashi Kanto, Meishin and Tomei lines have already repaid their construction costs and earned 514 billion yen of operating surplus in FY 2000. Kinki, Kyushu, Meihan and Tohoku lines with small remaining borrowing earned 368 billion

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[17] Unfortunately, however, the numerator in the rate of return does not reflect the true construction costs due to data limitation. It may underestimate the true costs by the following reason.

JH has a very idiosyncratic treatment of depreciation allowance and maintenance expenditures. They do not deduct depreciation allowance of roads, but add maintenance expenditures to the book value of roads. The book value of roads in their balance sheet is thus actually the accumulated sum of expenditures on construction and maintenance, measured at the current price.

To evaluate how much the book value differs from the true value, consider the following illustrative example. Suppose $1/N$ of real construction costs is needed each year to keep the quality of road. Denote the inflation rate by π. The book value of roads built M years ago becomes

$$\frac{C}{(1+\pi)^M} + \frac{C}{N} \sum_{j=1}^{M} \frac{1}{(1+\pi)^j} \quad ,$$

where C is real construction costs. As M goes to infinity, the book value converges to $C/\pi N$. With 52 of N (when JH was required to prepare the financial statement that adheres the standard of private companies, they set that the lifetime of road is 52 years), the book value becomes lower than the true construction costs (C) if the inflation rate is greater than 1.92 percent. Since the average annual growth rate of the Consumer Price Index between 1963 and 2000 is 4.25 percent, the construction cost is likely to be underestimated. Indeed older lines have a lower book value per kilometer.

Since the purpose of the present analysis is to point out the inefficiency of expressway construction projects, the upward bias upon the rate of return is not fatal for us.

yen of operating surplus. Since JH has these strong cash cows, they can pay the interest of 576 billion yen even after they lose 306 trillion yen to other lines.

Neither solvency nor current profit is a good measure of judging the business of JH. Two concerns cast doubt on the future financial health of JH. First, since the interest rate is currently very low in Japan, JH enjoys a lighter burden of interest payment. When the interest rate recovers to a higher level, they will suffer from a large hike of the interest payments. Secondly, the cross-subsidization scheme will not be sustainable, because the share of unprofitable lines will grow steadily.

4.2 Cost-Benefit Analysis of Existing Motorways

Whether national motorways are socially useful should be determined by the cost-benefit analysis of the project. According to the Ministry of Land, Infrastructure and Transportation, measurable annual user benefits of the current national motorways network are estimated to be around 9 trillion yen. Additional annual benefits from the *Seibi Keikaku* will be around 2 trillion yen, which is large enough to justify the construction of new expressways.

From the following observations, however, I suspect that their cost-benefit analysis overestimates the user benefit. First, the estimated benefit of toll roads is far larger than the toll revenue. Since a driver choose whether to take an expressway or a free road, the toll fee contains some information about the willingness to pay of marginal users of expressways. Thus the toll revenues become a lower bound of total willingness to pay for highways. If infra-marginal users do not have a quite high willingness to pay, toll revenues would reasonably approximate total willingness to pay. If so, the operating surplus (toll revenues minus operating costs) can be used as a proxy for benefits of expressway users.

The same kind of divergence between toll revenues and calculated benefits can be seen in the Honshu-Shikoku Bridges. Honshu-Shikoku Bridge Agency built 15 big bridges and roads over the Inland Sea of Japan with the construction costs of 2.89 trillion yen. Although the interest payments in FY 2000 were 136.8 billion yen, they earn only 86.5 billion yen of toll revenues, which is too little to repay their debt. According to the *ex post* cost-benefit analysis released by the Honshu-Shikoku Bridge Agency in December 2000, the present discounted value of benefits is 8.7 trillion yen

and the *B*/*C* ratio is 1.7. Since the Japanese government has used 1.5 as a cut-off level of the *B*/*C* for road construction, the construction project is not officially proved to be a mistake. The annual flow of user benefit in FY 2000 is about 250 billion yen.[18] If this number is reasonable, why are users reluctant to pay more than 86.5 billion yen as toll fees?

The second observation is that the value of time in the government cost-benefit analysis is derived from the average wage rate of workers reported in the Monthly Labor Survey (*Maitsuki Kinro Tokei*) by the Ministry of Health, Labor and Welfare, and it is currently 38.8 yen per minute. This setting of time value results in an overestimation, firstly because not all passengers are workers, and secondly because not all drives are on business. Thirdly, the value of time used in Japan is roughly more than double of used in other countries.

This paper then provides an alternative form of cost-benefit analysis based on the assumption that what users actually pay reflects the benefit. Suppose an investment project with initial construction costs, *C*, and the lifetime of capital stock is *N* years. Let *B* be the present discounted value of benefit, *y* the benefit at the initial year, *g* the growth rate of benefit, *r* the social discount rate. The benefit-cost ratio becomes

$$\frac{B}{C} = \frac{y}{C} \sum_{j=1}^{N} \left(\frac{1+g}{1+r}\right)^{j} .$$ (1)

Since we have to use the book value as a proxy for *C*, we assume that the lifetime of roads is infinite and that *C* includes the stream of maintenance expenditures.[19] The Equation (1) becomes

$$\frac{B}{C} = \frac{y}{C} \frac{1}{r-g} .$$ (2)

When the "rate of return" in Table 3 is a reasonable approximation of *y*/*C*, it can be used for the cost-benefit analysis. Since the Japanese guidelines of cost-benefit analysis recommends 4 percent as the social discount rate, an expressway with the rate of return

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[18] Since 8.7 trillion yen is the present discounted value of benefits during 40 years from now, the official cost-benefit analysis assumes the future traffic will grow by 3.24 percent per annum on average.

[19] Another factor of underestimating *C* is that the actual data do not contain the future maintenance expenditures. From the same reason as in footnote 17, this bias is not fatal for our purpose.

of more than 4 percent is socially desirable if the operating surplus does not grow.[20]

Table 3 indicates the overall rate of return of existing lines is 5.19 percent, which is well above the social discount rate practically used in Japan. The present value of welfare gains, $B - C$, is 8.7 trillion yen. The current lines of national motorway derive net gains to our economy. However, some newer lines exhibit a very low rate of return, which cannot be justified even with the very favorable treatment. Therefore, if we stopped building inefficient lines sometime ago, we could have enjoyed more net benefits by devoting resources into other useful purposes.

4.3 Cost-Benefit Analysis of New Construction Projects as a Whole

If JH continues to build an inefficient line, the expressway construction plan would become a huge social waste. Next we will examine the welfare costs of the *Seibi Keikaku*, which is estimated to spend 22.7 trillion yen to add new 2,491 kilometers into the existing network.[21]

Whether building new expressways is efficient or inefficient depends crucially on the projection of future traffic, which has been a controversial issue.

According to the government projection in December 1999, the traffic of national motorways would become 1.36 times as big as the level of 1999 when new lines of 2,491 kilometers are opened. While the traffic per kilometer declines slightly, this projection has been criticized as too optimistic. The traffic of national motorways has grown by 3.1 percent from 1996 to 2000, while the length of motorways has grown by 12 percent during the same period.

There are two main factors that influence the future traffic. First, since many newer

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[20] As already explained, the current guideline for road construction projects requires that the benefit-cost ratio of an enacted project be greater than 1.5. With $g = 0$, the ratio of initial benefit to construction costs should be greater than 6.7 percent. Therefore, our criterion is more generous than the official guideline. Another slightly generous treatment of the present analysis is that we accumulate benefits to the infinite future, while the official guideline suggests that only the first 40 years of benefits should be considered.

[21] 22.7 trillion yen is the author's estimation based on the JH's document that was reported to the Promotion Committee for the Privatization of the Four Highway-related Public Corporations in July 2002. For some lines that are missed from the document, numbers in Annual Report 2001 of JH are used. Since actual costs tended to exceed the planned costs, we are likely to have a conservative estimate of welfare cost.

lines will be built up in a less dense area, the average traffic will decline due to a law of diminishing returns. While more than 100 thousand cars per day drive on expressways in Tokyo, Nagoya and Kansai metropolitan areas, we can easily find in an edge of the network an expressway with the daily traffic of less than 10 thousand cars. Secondly, the aggregate traffic will be affected by macroeconomic activities, demographic conditions, or the shifts of demand for driving a car.

Under the simplified cost-benefit analysis presented in the last subsection, there is a simple relationship between the rate of return and the operating surplus. In order for the rate of return to be 4 percent (the operating surplus is 4 percent of construction costs), operating surplus per kilometer has to be 1.17 times as big as the current level. It is more appealing to connect the rate of return with the traffic. If the toll fee is unchanged, the toll revenues will be proportional to the traffic. We will thus focus on the toll revenues per kilometer. Using the FY 2000 data of 36 existing lines of which the opening rate is above 30 percent, I ran the following regression:

$$\text{operating surplus} = -24 + 0.89 \text{ toll revenues} \qquad\qquad (3)$$
$$(0.01)$$

Adjusted $R^2 = 0.998$ $\qquad\qquad s = 8.3$,

where variables are measured at million yen per kilometer and numbers in the parenthesis is the standard error of the coefficient. When the square of toll revenues was included in the regressed equation, it was not statistically significant. Equation (3) implies that if the toll revenues per kilometer grow by 16 percent, the operating surplus per kilometer will increase by 17 percent.

Table 4 presents a relationship between the toll revenues and the rate of return, based on Eq. (3). If the toll revenues per kilometer grow by 20 percent, the rate of return becomes 4.23 percent. The estimated welfare gains are around 4 trillion yen. However, if the toll revenues per kilometer grow only by 10 percent, the rate of return becomes 3.32 percent, and the welfare loss is 3.8 trillion yen. If the toll revenues per kilometer remain at the current level, the welfare loss amounts to near 9 trillion yen. If the toll revenues per kilometer decline by 10 percent, the loss exceeds 14 trillion yen.

4.4 Cost-Benefit Analysis of New Construction Projects by Line

Let us consider the effects of diminishing returns by looking at the profitability of

Table 4: The Relation between Toll Revenues and Welfare Gains of the National
Motorway Construction Plan

Toll revenues	Toll revenues per kilometer	Rate of return	Welfare gains
(FY 2000 = 1)	(FY 2000 = 1)	(percent)	(billion yen)
1.64	1.20	4.42	2,397
1.58	1.16	4.00	0
1.50	1.10	3.42	-3,289
1.36	1.00	2.42	-8,975
1.23	0.90	1.41	-14,660

Source: Author's calculation.
Note: Toll revenues are projections of total revenues after new expressways of
2,491 kilometers are opened. Toll revenues per kilometer are the toll revenues
devided by total opening length (9,342 kilometers). Rate of return is operating
surplus devided by construction cost (22,655 trillion yen). Welfare gains are the
product of the construction cost and (the rate of return - 4 percent) / 4 percent.

each line. The choice of future growth rate of traffic will affect the evaluation of new projects. Given the fact that the accuracy of future traffic projections is in doubt, another sophisticated projection inside the black box will not be appealing. This paper rather employed a naïve projection, because it becomes easy to trace how an alternative projection of future traffic affects our estimation. I first assume that the current lines with a high opening rate will keep the same traffic. Secondly, except for three cases, new lines with a low opening rate are assumed to have the same traffic as the nearby line.[22] I set the following assumptions for the exceptions. First, the unfinished parts of Joban and Hanwa expressways lie on the less dense area, but the current busy traffic of these lines is contributed largely by the part in the Tokyo and Osaka metropolitan areas respectively. I assume the overall traffic of Joban will be the same as that of Tohoku line, which parallels Joban line between Tokyo and Sendai. The overall traffic per kilometer of Hanwa is assumed to be the half of the current level. Secondly, since Daini Tomei and Daini Meishin lines parallel the existing lines, there will be a shift of traffic between the existing and new lines. I assume that Daini Tomei will have the half of the existing Tomei line and that Daini Meishin will have the half of Meihan-Kinki. It implies that the traffic through new and old Tomei-Meishin lines will grow by 50 percent.

Table 5 presents an estimation of welfare costs of building remaining 2,491 kilometers of national motorways under the above assumptions. New lines have a very low rate of return, and the overall rate of return is 1.44 percent, which cannot be justified by any reasonable social discount rates. A striking fact is that no lines exceed 4 percent, which is our generous cut-off rate. Although some lines (Higashi Kanto, Daini Tomei and Daini Meishin) is expected to have a busy traffic, their construction costs are extremely high, thus making the rate of return less attractive. Lines with the rate of return of more than 2 percent reside on Tokyo and Kansai metropolitan areas and Kyushu islands. The rate of return of most lines are smaller than 2 percent due to the projection of little traffic, although local lines have a cheaper construction cost. Since it is unbelievable that the future traffic will double in these areas, the inefficiency of these lines will not be defeated by any reasonable traffic projections.

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[22] Nihonkai Tohoku and Tohoku Chuo will follow Akita's experience. Chubu Odan will follow Tokai Hokuriku. Sanin will follow Okayama-Yonago. Hihashi Kyushu will follow Nagasaki-Oita.

Table 5: Welfare Costs of the National Motorway Construction Plan

Lines	Remaining Length (kilometer)	Operating surplus (my/km)	Construction cost (billion yen)	Cost per kilometer (billion yen)	Rate of return (percent)	Welfare gains (billion yen)
Do-o	128	51	361	2.82	1.80	-199
Sapporo, Doto	281	47	855	3.04	1.56	-523
Hachinohe	29	29	131	4.52	0.65	-110
Akita	44	25	212	4.82	0.52	-184
Yamagata	12	26	45	3.75	0.70	-37
Nihonkai Tohoku	157	*26*	835	5.32	0.49	-733
Tohoku Chuo	111	*26*	679	6.12	0.43	-607
Joban, Tokyo Gaikan	113	*269*	500	4.42	3.02	-123
Tateyama	20	254	149	7.45	3.41	-22
Higashi Kanto	37	613	1,351	36.51	1.68	-784
Kita Kanto	80	24	552	6.90	0.34	-505
Chuo, Meishin	3	421	127	42.33	0.99	-95
Tokai Hokuriku	40	43	234	5.85	0.73	-191
Daini Tomei	280	*333*	6,562	23.44	1.45	-4,190
Chubu Odan	98	*43*	746	7.61	0.56	-641
Meihan, Kinki	18	665	460	25.56	2.60	-161
Daini Meishin	166	*332*	4,097	24.68	1.39	-2,678
Hanwa	130	*173*	757	5.82	1.30	-510
Maizuru	75	68	460	6.13	1.11	-333
Tottori	68	*38*	354	5.20	0.73	-289
Okayama, Yonago	5	38	12	2.40	1.60	-7
Sanin (Onomichi-Matsue)	123	*38*	571	4.64	0.91	-441
Sanin (Tottori-Masuda)	18	*38*	93	5.17	0.74	-76
Takamatsu, Kochi	129	76	901	6.99	1.09	-656
Nagasaki, Oita	34	135	163	4.79	2.81	-49
Higashi Kyushu	289	*135*	1,448	5.01	3.06	-342
Total	2,491	196	22,655	9.09	1.44	-14,484

Note: Remaining length is taken from Annual Repot 2001, Japan Highway Public Corporation. Operating surplus per kilometer is basically based on the actual experience in FY 2000, although numbers in italics rely on other settings which are described in the text. Construction cost is obtained from JH's document and Annual Report 2001. Cost per kilometer is the construction cost devided by the remaining length. Rate of return is calculated as :(the operating surplus of total loads - the operating surplus of existing line) / the construction cost. Welfare gains are the product of the construction cost and (the rate of return - 4 percent) / 4 percent.

The total welfare losses of these new lines are estimated to be 14.5 trillion yen, which is about two thirds of the total expenditure. Under the assumption that the toll fee is unchanged, our estimation implies that the traffic per kilometer will decline about by 10 percent due to the construction of new roads with a less busy traffic. Even when we assume the aggregate traffic will grow by a considerable amount, the welfare loss will be inevitable.[23] The future construction of underused national motorways turns out to be a huge welfare loss among FILP projects.

As a sensitivity analysis, I next employ a more optimistic (hardly plausible) projection. Since revenues and costs of Daini Tomei and Daini Meishin are distinctly larger than those of other lines, I focus on the traffic of these lines and assume that their traffic will be at the same level of existing Tomei and Meishin lines. In this case, the overall rate of return of new lines turns out to be 2.11 percent, which is still far small. The resulting welfare loss is 10.7 trillion yen, which is 47.2 percent of construction costs.

There is more bad news. National motorways of 2,341 kilometers are not the whole story about the future welfare cost. As explained in the beginning of this section, JH is also building regional motorways of 2,300 kilometers, where the traffic will be much smaller. The national government finances a large part of construction costs of regional motorways with gasoline tax revenues, to help the operation of toll roads sustainable. In our criteria, a dominant part of such subsidies (they do not appear on the financial statement of JH) will result in a social waste. Since JH does not disclose enough information about these lines, unfortunately, it was impossible to conduct the same kind of analysis for these expressways here.

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[23] The Ministry of Land, Infrastructure, and Transportation released in June 2002 a new projection of total motor traffic of Japan. This projection shows that total traffic will reach a peak in around 2030, when it will be 1.15 times as big as the level of 2000. Although the projection is revised downwards from the previous one, it has been criticized as still too optimistic.

5. Concluding Remarks

The current scheme of the FILP was shaped in 1951, when the financial markets and private financial intermediaries were not well developed. Since the long-term fund was not provided by the private sector, the government had played an important role in allocating resources in the capital market. At the same time, a quick development of infrastructures was given a high priority. The role of the FILP is considered to fit such a situation that may be typical in developing countries. Unless we believe Japan is still a developing country after 50 years, we have to feel strange that the FILP continues to keep an original style.

We have thus to reexamine what is a suitable way of intervening a developed financial system. The fundamental reform in 2001 was not a final answer. We need another drastic reform of FILP agencies. The reform of special public institutions is effectively the second step of the FILP reform. Although many of FILP agencies are determined to be transformed to an agency, there is a danger that the newly established agency will take over inadequate business of the existing special public institution. Whether we get an effective reform and a streamlined FILP is now at stake.

Doi and Hoshi (2002) revealed that the past inadequate activities of the FILP had created a huge amount of bill to taxpayers. The already created loss is unavoidable. What is important for the current decision-making is how not to produce a further welfare loss in the future FILP programs. Section 4 picked up expressway construction projects as an example of projects that are likely to be a social waste. The welfare loss of building inefficient national motorways of 2,491 kilometers is estimated to be 14.5 trillion yen, which is about two thirds of construction costs. To avert such kind of welfare loss, we have to conduct further analysis that carefully examines the adequacy of other activities of the FILP agencies.

References

Cargill, Thomas F., and Naoyuki Yoshino (1999), "The Postal Savings System, Fiscal Investment and Loan Program, and Modernization of Japan's Financial System," in Takeo Hoshi and Hugh Patrick eds., *Crisis and Change in the Japanese Financial System*, Boston: Kluwer Academic Publishers, pp. 201-230.

Cargill, Thomas F., and Naoyuki Yoshino (2001), *The Postal Savings System and Fiscal Investment and Loan Program in Japan: Financial Liberalization, Dilemmas, and Solutions*, manuscript.

Doi, Takero, and Takeo Hoshi (2002), "FILP: How Much Has Been Lost? How Much More Will Be Lost?" in Magnus Blomstrom, Jenifer Corbett, Fumio Hayashi and Anil Kashyap eds., *Structural Impediments to Growth in Japan*, Chicago: The University of Chicago Press, forthcoming.

Fukao Mitsuhiro (1998), "Zasei Toyushi Seido no Gaikan to Mondai no Shozai," in Kazumasa Iwata and Mitsuhiro Fukao eds., *Zaisei Toyushi no Keizai Bunseki*, Nihon Keizai Sinbunsha, pp. 1-23 (in Japanese).

Hart, Oliver, Andrei Shleifer, and Robert W. Vishny (1997), "The Proper Scope of Government: Theory and an Application to Prisons," *Quarterly Journal of Economics*, Vol. 107, Issue 4, pp. 1127-1161.

Higano, Mikinari (1986), *Kin-yu Kikan no Shinsa Noryoku*, Tokyo: The University of Tokyo Press (in Japanese).

Ide, Ichiro and Toshihiko Hayashi (1992), "Kin-yu Chukai ni Okeru Koteki Bumon no Yakuwari," Akiyoshi Horiuchi and Naoyuki Yoshino eds., *Gendai Nihon no Kin-yu Bunseki*, Tokyo: The University of Tokyo Press, pp. 219-247 (in Japanese).

Ikeo, Kazuhito (1998), "Seifu Kin-yu Katsudo no Yakuwari: Riron Teki Seiri," in Kazumasa Iwata and Mitsuhiro Fukao eds., *Zaisei Toyushi no Keizai Bunseki*, Nihon Keizai Sinbunsha, pp. 25-48 (in Japanese).

Iwamoto, Yasushi (1998), "Zaito Sai to Zaito Kikan Sai," *Financial Review*, Vol. 47, pp. 134-153 (in Japanese).

Iwata, Kikuo (1988), "Koteki Kin-yu to Kin-yu Jiyuka," Kikuo Iwata and Tsuneo Ishikawa eds., *Nihon Keizai Kenkyu*, Tokyo: The University of Tokyo Press, pp.

215-228 (in Japanese).

Ishi, Hiromitsu (2000), *Making Fiscal Policy in Japan: Economic Effects and Institutional Settings*, Oxford: Oxford University Press.

Kaizuka, Keimei (1981), "Kin-yu ni Okeru Mingyo to Kangyo," Kikan Gendai Keizai, Special Issue, pp. 42-50 (in Japanese).

Mankiw, N. Gregory (1986), "The Allocation of Credit and Financial Collapse," *Quarterly Journal of Economics*, Vol. 101, Issue 3, pp. 455-470.

Matsuura, Katsumi, Kiyoshi Mitsui, and Hiroshi Kitagawa (1991), "Kashidashi Shijo to Koteki Kin-yu: Fukinko Bunseki," in Katsumi Matsuura and Toshiaki Tachibanaki eds., *Kin-yu Kino no Keizai Bunseki*, Tokyo: Toyo Keizai Sinposha, pp. 119-145 (in Japanese).

Sappington, David E. M., and Joseph E. Stiglitz (1987), "Privatization, Information and Incentives," *Journal of Policy Analysis and Management*, Vol. 6, No. 4, Summer, pp. 567-582.

Takahashi, Yoichi (1998), "Zaisei Toyushi Kaikaku no Hoko," Kazumasa Iwata and Mitsuhiro Fukao eds., *Zaisei Toyushi no Keizai Bunseki*, Tokyo: Nihon Keizai Shinbunsha, pp. 175-243 (in Japanese).

Yoshino, Naoyuki (1994), "Kasenteki Shijo ni Okeru Koteki Kin-yu no Yakuwari," in Keimei Kaizuka and Kazuo Ueda eds., *Henkakuki no Kin-yu Sisutemu*, Tokyo: The University of Tokyo Press, pp. 119-141 (in Japanese).