

環境関連財政支出および企業の環境対策による

マクロ的経済効果に関する日中比較研究

名古屋大学図書

課題番号12430008



20106108

平成12-14年度文部科学省科学研究費補助金(基盤研究B1)研究成果報告書

平成15年(2003年)3月

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研究組織および研究費

平成 12-14 年度文部科学省科学研究費補助金（基盤研究 B1）研究成果報告書
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研究費

平成 12 年度：4,000 千円

平成 13 年：3,700 千円

平成 14 年：4,100 千円

名古屋大学図書



20106108

はじめに

新興工業国は、経済発展の初期段階から一般の公害対策に加えて地球規模での環境問題への対応が迫られている。この点で先進工業国が、当初主として局所的な環境問題（公害）への対応することで経済成長を成し遂げてきた発展過程と大きく異なる。先進工業国は経済成長を成し遂げた後に地球規模の環境問題への対応が迫られるようになったことで、先進工業国の側に、新興工業国が現在抱える環境・経済問題解決のための十分な理解があるとは言えない状況にある。経済成長とともに加速する新興工業国の環境問題解決のためには、先進工業国は、環境汚染の内部化に成功したプロセスにおける政府・企業の役割（対策）を明らかにし、新興工業国がとるべき環境対策の方向を示して行く必要がある。

現代の新興工業国（中国およびアジア NIES）は、国際市場における工業製品の飽和を考慮すれば、いっそう厳しい経済条件下で環境保護を進める必要にさらされている。この現実をふまえ、本研究は、新興工業国側の要請に基づき、環境政策がそのマクロ経済全般にもたらす効果を明確にすることを試みたもので、経済成長の維持と地球規模での環境保全を合わせた持続的経済成長のための政策立案に対し有効な情報提供を通して、新興工業国が自らの環境対策を進めていくため指針の提供を目指してきた。

この報告書は、大きく二つの部分からなっている。第一部の「**Economic Development : Environment Perspective**（経済発展：環境の視点）」は、主としてこの研究に携わった研究者の経済発展と環境保護にかかる研究成果をまとめたものである。ここでは、2000年にこの科研プロジェクトの一環として開催した国際シンポジウム「**Environment and Our Sustainability in the 21st Century: Understanding and Cooperation between Developed and Developing Countries**」において報告いただいた中国国家環境保護総局局長（部長）の彭近新氏およびシカゴ大学経済学部のジョージ トーレイ教授の論文をプロシーディングスから再録させて頂いた。

第二部の「**Economic Growth: Regional Perspective**（経済発展：地域の視点）」は2000年に寧夏大学と共催した『中国西部経済発展国際シンポジウム』において報告された論文のうち地域開発の視点から経済発展を分析した研究を収録している。地域開発の論文を同時に収録したのは、環境問題の解決にはその地域それぞれの政府と民間の地道な取り組みがわけても重要であると私が考えたことに他ならない。発展途上国の環境問題を解決に導く鍵が、地域の経済発展パターンの厳密に分析を通して得られる可能性が高い。

第二部にも、シカゴ大学経済学部のトーレイ教授が『中国西部経済発展国際シンポジウム』に出された論文を収めさせて頂いた。この論文は、寧夏大学の呉教授や私が、シカゴ大学でトーレイ教授の主宰されている中国の西部開発に関する研究会のメンバーに加えて頂いていたことから、このシンポジウムのために書いてくださったものである。また、名古屋大学大学院法学研究科の加藤久和教授、同経済学研究科の塚田弘志教授は、この科

研のメンバーではなかったが、それぞれご専門のお立場から中国の環境問題と地域開発に資するためということで論文を用意してくださるとともに本報告書への掲載を快く了承してくださいました。

本報告書の構成にかかる話に加えて、寧夏大学と『中国西部経済発展国際シンポジウム』を共催するに至った経緯、この科研プロジェクトがもたらした思わぬ波及効果およびこの報告書が英語で編集された理由について簡単に触れさせて頂きたい。

現在の中国の重点政策である「西部開発」と「環境保護」の研究を進めるべく寧夏大学西部発展研究センターが2001年10月に設立されたことから、寧夏大学副学長で同センター主任（当時 現寧夏省社会科学院院長）の呉海鷹教授からの強い研究協力要請があった。この要請に対し、研究分担者の大分大学の薛進軍教授と相談の上、この科研プロジェクトの最終報告会を寧夏大学の『中国西部経済発展国際シンポジウム』に併せて開催することにした。中国の環境問題への貢献姿勢を明確できかつ我々の研究成果を公開できる絶好の機会ととらえ、積極的な協力を行うこととなった。もともと我々の研究は、先にも述べたとおり、先進国の公害克服の経験を経済学的に明らかとすることで環境問題に直面している新興工業国の環境政策に寄与することを目的としたものであることから、寧夏大学においてこのような形で我々の研究成果を発表する機会が与えられたことは、誠にうれしいことであった。

この研究プロジェクトでは、2002年度に西安市、桂林市、南寧市、2003年度には寧夏省で、政府の環境政策と企業の対応に関する質問票調査を実施した。この調査では、国家環境保護総局の彭近新司長および北京大学環境科学研究所の栾胜基教授の研究協力をお願いし、栾先生の大学院生をそれぞれの環境保護局に派遣してもらい、その院生が現地での調査員の指導を行うという形で企業調査を進めることができた。3人の北京大学の院生が協力してくれた。寧夏大学でのシンポジウムに栾先生がこの3名の大学院生を伴っていらしたが、驚いたことにはこの院生たちが、集めたデータをもとに自分たちですでに企業の環境対策に関する分析を始めており、その成果をシンポジウムで報告してくれた。寧夏大学の呉先生も、寧夏省での質問票調査のデータをもとにこの報告書の第7章に収録した研究をまとめられていた。

私は、この瞬間まで、中国において、研究者自らがデータを採りそれをもとにして自らが環境政策と企業の対応に関する分析を行い自らが政策提言を行うようになるには今しばらくの時間がかかると考えていた。このゆえに、「公害先進国・環境先進国」の日本が主導する形で、中国の環境をテーマとする研究プロジェクトを進めた。ところが、研究成果の公刊においても、寧夏大学の呉教授に先を越されてしまうといううれしい誤算が生じた。我々の研究チームの報告を含む『中国西部経済発展国際シンポジウム』での報告論文は、中国語に翻訳され《中国西部経済発展理論と実証研究》として一足先に中国经济出版社から出版された。

出版の計画段階から、この科研プロジェクトに対して研究協力をしてくださった多くの方々、さらにはこの科研の研究分担者や研究協力者から、一連の研究成果を英語版として編集してほしいとの希望が出されていた。特に、中国の研究者に、この要望が強かった。この要請に応えるべく、また我々の研究のいっそうの国際化を図るという目的を兼ね、この報告書は英語で編集することとなった。本報告書が、表紙と前書きを除き、英語版となったのはこの事情による。

この文部科学省科学研究費補助金『環境関連財政支出および企業の環境対策によるマクロ的経済効果に関する日中比較研究』を終えるにあたり、このプロジェクトに対しさまざま形でご助力をくださった方々に対して、研究チームを代表しお礼を申し上げたい。わけでも、名古屋大学名誉教授飯田経夫先生、中国国家環境保護総局司長彭 近新氏、シカゴ大学経済学部名誉教授ジョージ・トリー氏、韓国エネルギー経済研究所所長李 相驥氏、中国寧夏省社会科学院院長呉 海鷹氏からはなにもものにも代え難い貴重なご助言と多くの支援を受けた。この方々のご理解なしにはこの研究プロジェクトはけっして成立しなかったといっても過言ではない。

最後に、名古屋大学経済学研究科事務局の効率的にしてかつ心のこもった研究サポートに対して感謝の意を表したい。事務長の鈴木宏治氏（ご退官）、同古田牧夫氏、庶務掛長の中山聖英氏、会計掛長の小林雪子氏（ご退官）、同林 光治氏、会計掛主任の伊藤 誠氏、会計掛事務官大場 亮氏、同小椋友明氏ほか大勢の方々の研究支援に対し感謝申し上げたい。

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Chapter 11

Financing Economic Development: Japan's Experience after the World War II

Hiroshi Tsukada[†]

1. Introduction

The development of Western region is a very important and challenging task for China. From my viewpoint, one of the most fundamental problems in carrying out this task is how to finance it. Namely, how to raise funds and allocate them efficiently among many projects should be the first concern for the government.

Needless to say, promoting development requires huge amount of long-term funds for capital investment. There are two systems to secure long-term funds. One is capital market consisting of stock market and corporate bond market like in the US and England. The other is banking system like in Japan and Germany.

Several conditions must be fulfilled to have a well-organized and smoothly functioning capital market: i.e., ample accumulation of financial assets, investors who can reduce risk by diversifying portfolio, issues of stocks or bonds who has established their name in the market, rating organization, disclose system of accounting information and so on.

On the other hand, such conditions are less relevant under private banking system. Everything tends to concentrate to banks. Banks can gather information and assess the feasibility of the project proposed by the borrower. When banks furnish funds to the borrower, they monitor the practice of the project. And if the borrower is financially distressed or gets into some trouble in his business, they make advice to settle these issues.

Comparing these characteristics of the above two systems, I suppose that a system based on baking could perform principal role in the development of Western region. If we consider the degree of current development in Western region, Japanese experience after the World War II might be useful to a large extent. Banking system has

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been playing prominent roles in the Japanese financial system until now. That is why I will explain the Japanese banking system, focusing on how they secured long-term funds in the period of high rate of growth.

2. Establishing Bases for Long-term Credit

Let me explain the formation of postwar financial system in Japan. Its basic framework was established towards the end of 1940's. At that time, the U.S. tried to establish capital market in Japan. But this challenge by US failed in due course.

During and immediately after the war, due to excessive inflation accumulated financial assets lost most of their values. The ratio of financial assets to GNP dropped sharply, and it reached its bottom, 0.5, in 1950, compared with 2.2 recorded in 1940s. With diminished value of financial assets and unprecedented low-level income, it was impossible for general public to save enough and invest in capital market. In addition to it, banks had established their network under wartime financial system. Therefore banks deposits absorbed the greater part of savings, and banks shouldered prominent role in Japan.

In this system, a vital issue was to provide long-term funds for capital equipment. On one hand, the reconstruction of economy and modernization of industrial facilities enhanced demand for equipment funds. But on the other hand, the bank finance of Japan was founded on the British-style commercial bank concept. So, it was thought unsound for banks to finance long term loans with their financial resources comprised mainly short-term funds.

In this situation, Japanese government builds up two vehicles of long-term funds. The first category is so called long-term credit banks, which are privately owned banks. The second is Japan Development Bank (JDB), which is specially installed public organization.

In 1952, the Long-Term Credit Bank Law was enacted, and it separated long-term finance from short-term finance institutionally. Also in 1951, the Japan Development Bank Law was enacted. The purpose of JDB is to supplement and encourage private financial institutions by supplying long-term funds. According to Japanese government, private financial institutions by themselves could not assume long recovery period or high-risk loans necessary to promote economic and social development.

3. Long-term Credit Banks

There were three long-term credit banks in Japan. They were given the privilege to issue bank debentures that were absent in ordinary banks. With this bank debenture they were able to procure funds with maturities from 3 to 5 years.

At the same time, Ministry of Finance provided administrative guidance, which asked ordinary banks to limit the term periods of their time deposits to only 3 months, 6 months, and one year.

Toward the end of 1960s, the greater part of bank debentures of long-term credit banks were underwritten by ordinary city banks. In this period, as I mentioned, savings were not enough, the level of financial assets were low, and the general public were not interested in long-term securities. In these situations, big ordinary banks, so-called city banks, underwrote nearly half of these bank debentures due to the following three reasons: 1) Certainly, for city banks providing loans was more profitable than holding bank debentures but holding bank debentures bought them definite margin, 2) In exchange for holding bank debentures, city banks could expect cooperation of long term credit banks when their customs needs long term funds. It is believed that if city banks purchased bank debentures, they could withdraw twice as much money as their purchase in the form of long-term loans to their customs, 3) Bank of Japan accepted bank debentures as collateral when city banks borrowed money from Bank of Japan. The interest rates on these borrowings were lower than money market rate. So, actually Bank of Japan compensated city banks for cost of holding bank debentures.

In the latter half 1960s, Japanese government began to issue government bonds which competed with bank debentures. City banks decreased purchase of bank debentures, however, private investors, especially rich ones, made up for this decrease. It is believed that bank debentures were misused to evade inheritance or income tax. Since they were unregistered, rich people could purchase them anonymously and hide their asset or income.

4. Japan Development Bank

JDB was established by JDB Law in 1951, and conducts its activities according to this law. The purpose of JDB is to supplement and encourage private financial institutions by supplying long-term funds. JDB's capitalization value is totally invested by the government.

It obtains necessary funds for its operation through borrowings from the

government. And the funds retained by the government are collected mainly through postal savings and postal life insurance and amenities.

Postal savings were initiated in the 1870's. Backed by government credit, it was regarded as reliable and safe by the general public. In addition to it, network of nearly 24, 000 post offices covered Japan and reached every remote area in the country. So, postal savings was accessible to wide range of people. Even the greatest city bank could not compete with the wide accessibilities of the postal saving.

Through this network, the government offered postal life insurance and postal annuities while private insurance targeted only high-income people. The government initiated these two services (life insurance in 1916, annuities in 1926) to supplement private insurance and tried to provide these services at lowest possible charge.

Now surplus fund of postal savings, postal life insurance and annuities, that is fund remained when necessary expenses are excluded, were deposited with Trust Fund Bureau Fund controlled by Ministry of Finance. They became a major source for JDB. These funds could make an average loan period of JDB much longer than that of city banks or long-term credit banks. In 1965, average loan periods of JDB was 11.3 years, it was 2.9 years in city banks, and was 4.8 years in long-term credit banks.

It is natural for city banks to have such short average figures. But we have to pay attention to the clear difference between long-term credit bank and JDB. Postal savings made it possible for JDB to finance its funds with such a long-term condition. Backed by government credit and wide accessibility, average retaining periods of postal savings were clearly different from that of deposit of ordinary banks. One estimate says that in 1965 the former was 3.8 years and the latter was 0.9 years. This postal savings were entrusted in Trust Fund Bureau Fund for 7 years or longer, and the government would offer these funds to JDB even with longer terms. In this way JDB would supplement and encourage private financial institutions. (See Tables 1 and 2)

5. Economic Development and JDB

Now I would like to concentrate on JDB. In the first half of 1950s, Japanese government established many financial institutions. The people's Finance Corporation (1949), The Export Bank of Japan (1950), JDB (1951), the Agriculture, Forestry and Fisheries Finance Corporation (1953) and the Small Business Finance Corporation (1951), all these corporation except JDB and the Export Bank of Japan supplied funds to some specified area only. But JDB and the Export Bank of Japan were not limited to specific area. They were designed to respond flexibly to the changing situation of

Japanese economy. Let us now briefly review JDB's operation in the following stages.
1950's

When JDB was established in 1951, the policy goal of the government was modernizing industrial facilities to strengthen international competitiveness. Exchange rate was set at 360 Yen per dollar, but wholesale price level had been rising sharply. To restore international competitiveness, it was necessary for Japan to modernize facilities of basic industries and improve general cost structure of industrial sector as a whole. JDB concentrated its finance to basic industries such as electric power, coal mining, ocean shipping, and iron & steel manufacturing. In 1952 and 1953, JDB's share of financing capital investment in these four industries run up to the number between 15% and 30%.

The latter half of 1950s has been devoted to the stage of reconstruction. Japan tried to catch up the advanced industrial economies. Policy goals expanded from consolidating basic industries to include improving industrial structure and enriching social environment.

To improve industrial structure, JDB supplied funds to machinery, electronics, and petrochemicals, synthetic rubber and so forth. To enrich social environment, JDB supplied funds to private railroads, urban gas facilities and so forth. (Table 3)

1960's

In June 1960, the Trade and Currency Exchange Liberalization program was decided. Japan's Trade liberalization rate was approximately 40% at that time, but it increased to 95% in 1965. Japan was going to open her economy rapidly. Japanese economy no longer could enjoy government support under semi-closed system. It had to strive to compete with foreign industries under the new open system.

JDB supplied its funds to support necessary adjustments in many industries such as machinery, electronics, computers, and steel and so forth. Towards the end of 1960s, Japan had essentially carried out almost all the necessary adjustment for trade liberalization. But Japan faced such new problems as pollution, scarcity of social capital, overcrowding of urban areas, under population of other areas due to the rapid economic growth. JDB responded this situation by funding redevelopment of urban areas, project to control pollution and so forth. At that time, it kept its policy goal to develop a base for high-level economic growth by shifting energy financing from coal mining to petroleum.

1970's

Policy goals in this period were set mainly through the following two

considerations. Domestically, public concern about pollution surged. And the national welfare was recognized as equally important as high-growth. Internationally, fixed exchange rate system collapsed, Yen rate appreciated rapidly, and two oil crises shackled Japanese economy.

Japan had enjoyed low price and affluent crude oil as a matter of course. But two oil crises made the prospect of energy supply situation very uncertain, and imposed Japan to take urgent energy conservation.

In 1972, The JDB Law was revised and social and economic development was given equal weight to industrial development, which had been the object of JDB. JDB financed such areas as pollution control, urban development, energy conservation, augmenting petroleum stockpiles. The emphasis of JDB lending moved from expanding economy quantitatively to contributing economic progress qualitatively.

1980's and after

At this point, JDB's tasks reached to a kind of completion. In 1980s and 1990s several new changes were introduced, but they are characterized as fine-turnings to already established JDB activities.

At this stage, with the fundamental change in surrounding economic conditions, JDB and long-term credit banks experienced hardship gradually. After two oil crises, the rate of growth was decelerated to approximately 4 to 5% level. So, the rate of growth of capital investment lost its momentum.

As a result, Japanese big corporations could finance their capital investment mainly through their internal funds. The need for long-term funds dropped sharply. In the latter half of 1980's, the roles of JDB become a topic of controversy. The issues raised at the time were whether to restrict the scope and volume of JDB's activities in order to not disturb private financing. This topic has not been settled until now. But whenever some remarkable deregulation is fulfilled in public sector, the role of JDB has been kept as objects of controversy.

6. JDB's Roles for Economic Development

Let us summarize JDB's roles into 3 points.

1) It provided funds to many projects to which private financial institutions by themselves could not have supplied enough credits. There are projects that have lengthy recovery periods such as electric power, projects which have high technical or

market risk such as commercialization of new technologies, and projects which are socially desirable but economically profitable not enough such as pollution control. In this sense it could enhance the efficiency of whole economy.

2) It bought together enough long-term funds and specialists within one organization and successfully avoided duplication of investment in fund and staffs. Important information related development was concentrated into JDB. And this information raised the accuracy of JDB's assessment and reliability of its advice. It participated in the formation of many national industrial policies as an indispensable member.

3) It played guiding role to private sector. The government could send signals to market through JDB's activities. Its active investment meant that the government had chosen specific area as its policy goal. JDB's respected ability meant that private sector could trust future prospect of this area. And by showing that JDB actually bears the risk in that area, the will of the government to support that area become more credible. In these ways, the government could guide the private sector to its policy goals.

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Table 1. Total amount of Lending of JDB

(End of Fiscal Year Billions of Yen)

| 1955 | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 1999 |
|------|------|-------|-------|-------|-------|-------|-------|--------|--------|
| 389 | 642 | 1,037 | 1,814 | 3,472 | 5,398 | 7,680 | 9,649 | 15,578 | 17,396 |

Note: 1. Japanese Fiscal Year beings are April and ends in March.
 2. Japan Development Bank was reorganized to Development Bank of Japan in 1999.
 So, The figure in 1999 was recorded in September 1999.

Table 2. Total Amounts of Private Financial Institutions,
 Public Financial Institutions and JDB.

(End of Fiscal Year Billions of Yen)

| | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 1999 |
|--------------------------------|--------|--------|---------|---------|---------|---------|---------|---------|
| Private Financial Institutions | 33,373 | 74,508 | 170,489 | 270,502 | 422,668 | 698,735 | 765,151 | 719,686 |
| Public Financial Institutions | 3,473 | 8,011 | 19,771 | 43,065 | 66,200 | 92,914 | 133,141 | 151,285 |
| JDB | 1,037 | 1,814 | 3,472 | 5,398 | 7,680 | 9,649 | 15,578 | 17,396 |

Note: Figures in 1999 were recorded in September 1999.

Table 3. Shares of Five Main Areas in Total amount of Lending of JDB

1) 1960 (%)

| | |
|-------------------------|------|
| Electricity | 50.2 |
| Maritime Transportation | 26.5 |
| Steel | 12.9 |
| Coal | 4.9 |
| Petrochemical | 1.6 |
| Regional Development | 1.6 |

2) 1965 (%)

| | |
|-------------------------|------|
| Electricity | 36.3 |
| Maritime Transportation | 27.4 |
| Regional Development | 9.6 |
| Coal | 6.4 |
| Steel | 3.7 |
| | |

3) 1970 (%)

| | |
|--|------|
| Maritime Transportation | 36.3 |
| Energy | 27.4 |
| Regional Development | 9.6 |
| Redevelopment of Big Cities and Modernization of Distribution system | 6.4 |
| Development of Technology | 3.7 |
| | |

4) 1975

(%)

| | |
|---------------------------------------|------|
| Maritime Transportation | 21.6 |
| Development of Cities | 16.9 |
| Reinforcement of Private Railroads | 8.1 |
| Redevelopment of Big Cities | 5.8 |
| Improvement of National Life | 16.6 |
| Pollution Control | 14.2 |
| Resources and Energy | 15.7 |
| Atomic Energy | 11.6 |
| Petroleum | 3.8 |
| Regional Development | 12.5 |

5) 1980

(%)

| | |
|--------------------------------------|------|
| Resource & Energy | 25.5 |
| Atomic Energy | 13.1 |
| Densification of Energy Source | 7.2 |
| Development of Cities | 19.9 |
| Reinforcement of Private Railroad | 9.3 |
| Redevelopment of Big cities | 8.2 |
| Improvement of National Life | 18.7 |
| Pollution Control | 14.0 |
| Gas | 2.5 |
| Regional Development | 12.7 |
| Maritime transportation | 10.5 |

6) 1985

(%)

| | |
|---------------------------------------|------|
| Resource & Energy | 43.2 |
| Atomic Energy | 18.4 |
| Densification of Energy Source | 13.0 |
| Petroleum | 5.1 |
| Development of Cities | 17.6 |
| Reinforcement of Private Railroads | 9.2 |
| Redevelopment of Big Cities | 6.5 |
| Regional Development | 9.5 |
| National Transportation | 9.4 |
| Improvement of National Life | 9.2 |
| Pollution Control | 8.2 |

7) 1990

(%)

| | |
|---|------|
| Resource & Energy | 39.7 |
| Atomic Energy | 18.3 |
| Densification of Energy Source | 13.7 |
| Petroleum | 3.6 |
| Development of Cities | 19.8 |
| Reinforcement of Private Railroads | 10.0 |
| Redevelopment of Big cities | 8.4 |
| Promotion of Technology | 9.6 |
| Steering up Informatization | 5.3 |
| Promotion of Industrial Technology | 4.3 |
| Regional Development | 8.4 |
| National Transportation And Airplane | 6.7 |
| National Transportation | 4.7 |
| Airplane | 1.9 |

8) 1995 (%)

| | |
|---|------|
| Resource & Energy | 35.8 |
| Atomic Energy | 15.0 |
| Densification of Energy Sources | 12.7 |
| Consolidation of Life and City Infrastructure | 25.3 |
| Development of Cites | 12.0 |
| Reinforcement of Private Railroads | 2.3 |
| Consolidation of Basic Transformation System | 13.4 |
| Basic Railroads | 6.1 |
| Facilities related to Airplane & Airport | 5.3 |
| Regional Development | 7.6 |
| Consolidation of Information & Communication Infrastructure | 6.7 |