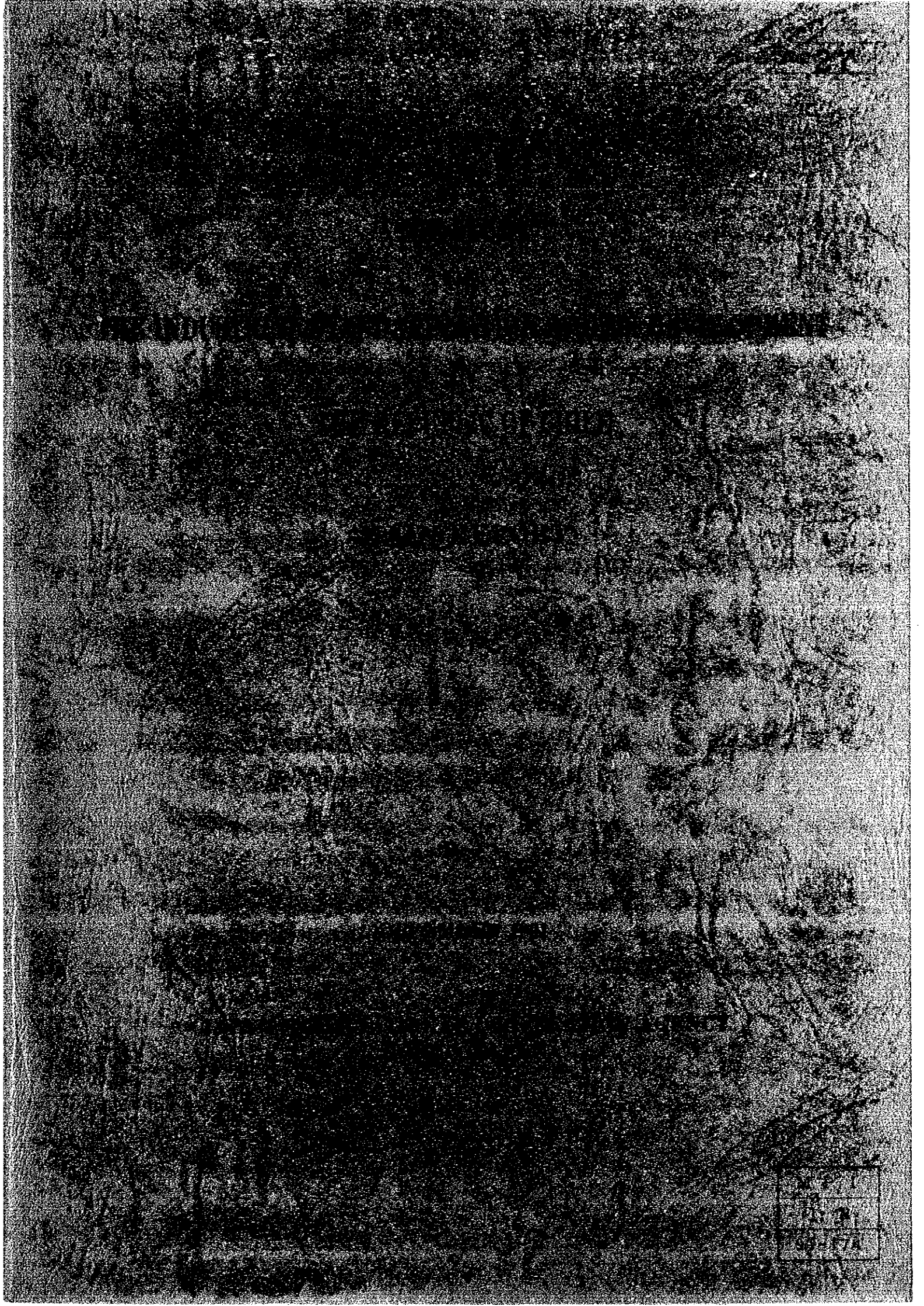


THE STUDY
ON
THE INDUSTRIAL STANDARDIZATION SYSTEM DEVELOPMENT
IN
THE REPUBLIC OF CHILE

〈MAIN REPORT〉

DECEMBER 1991

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO, JAPAN

PREFACE

In response to a request from the Government of the Republic of Chile, the Government of Japan decided to conduct the Study on the Industrial Standardization System Development in the Republic of Chile and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent to the Republic of Chile a study team headed by Mr. Kanji Kakinuma, Executive Director, Japanese Standards Association in June, 1991.

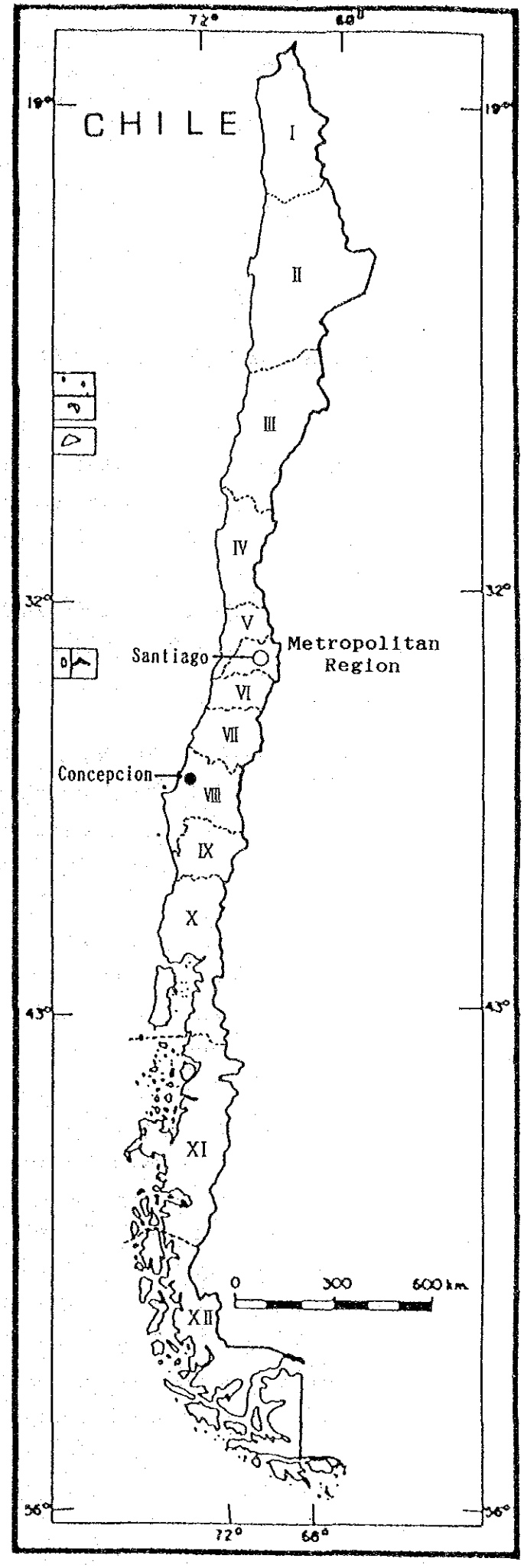
The team held discussions with the officials concerned of the Government of the Republic of Chile, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the plan and to the enhancement of friendly relationship between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Chile for their close cooperation extended to the team.

December, 1991

Kensuke Yanagiya
President
Japan International Cooperation Agency


CHILE
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII
Santiago
Metropolitan Region
Concepcion
0
300
600 km
72°
68°
19°
32°
43°
56°

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List of Abbreviations

A A S H T O	The American Association of State Highway and Transportation Officials
A F N O R	Association Française de Normalisation
A N S I	American National Standards Institute
A O A C	Association of official Analytical Chemists
A P I	American Petroleum Institute
A P S T C	Asociacion de Productores de Salmon y Trucha de Chile
A Q L	Acceptable Quality Level
A S C A L	Asociación Chilena de Control de Calidad
A S E X M A	Asociación de Exportadores de Manufacturas
A S I M E T	Asociación de Industrias Metalúrgicas y Metalmecánicas
A S M E	American Society for Mechanical Engineers
A S N T	American Society for Nondestructive Testing
A S Q C	American Society for Quality Control
A S T M	American Society for Testing and Materials
A W P A	American Wood-Preservers' Association
A W S	American Welding Society
A W W A	American Water Works Association
B I P M	International Bureau of Weights and Measures
B S	British Standards
B. V.	Bureau Veritas
C C V	Consumo y Calidad de Vida
C. Ch. C	Cámara Chilena de la Construcción
C E N	European Committee for Standardization
C E N E L E C	European Committee for Electrotechnical standardization
C E S M E C	Centro de Estudios, Medición y Certificación de Calidad
C H I L E C T R A	Chilectra Metropolitana
C I E	Comite de Inversiones Extranjeras
C I M M	Centro de Investigación Minera y Metalúrgica de Chile
C I R E N	Centro de Investigacion de Recursos Naturales
C. N. E.	Comision Nacional de Energia
C O D E X	Codex-Alimentarius Commission
C O P A N T	Comisión Panamericana de Normas Técnicas
C O R F O	Corporación de Fomento de la Producción
C O R M A	Corporación Chilena de la Madera
C. P. C.	Confederación de la Producción y el Comercio

C. T. I.	Compañía Tecno Industrial S.A.
D. A. E.	Dirección de Aprovisionamiento del Estado
D I C T U C	Departamento de Investigaciones Científicas y Tecnológicas, Universidad Católica de Chile
D I N	Deutsches Institut für Normung
E N D E S A	Empresa Nacional de Electricidad S.A.
E O Q C	European Organization for Quality Control
F A C h	Fuerza Aérea de Chile
F O N D E F	Fondo de Fomento a la Investigacion Cientifica y Tecnologica
F O N D E C Y T	Fondo Nacional de Desarrollo Cientifico y Tecnologico
F O N T E C	Fondo de Desarrollo Tecnologico y Productivo
G A S C O	Compañía de Consumidores de Gas de Santiago
I C A R E	Instituto Chileno de Capacitacion Racional de Empresa
I D I C	Instituto de Investigaciones y Control del Ejército
I D I E M	Instituto de Investigación y Ensayes de Materiales, Universidad de Chile
I E C	International Electrotechnical Commission
I F A N	International Federation for Association of Standards Congress
I F O P	Instituto de Fomento Pesquero
I L A C	International Laboratory Accreditation Conference
I N A C A P	Instituto Nacional de Capacitación Profesional
I N E	Instituto Nacional de Estadística
I N F O R	Instituto Forestal
I N N	Instituto Nacional de Normalización
I N T E C	Instituto de Investigaciones Tecnológicas
I S	Indian Standards
I S O	International Organization for Standardization
I S P	Instituto de Salud Publica de Chile
I T I N T E C	Instituto de Investigacion Tecnologica
J I S	Japanese Industrial Standards
M B N	Ministerio de Bienes Nacionales
M D A	Ministerio de Agricultura
M D H	Ministerio de Hacienda
M D I	Ministerio del Interior
M D J	Ministerio de Justicia
M D M	Ministerio de Mineria
M D N	Ministerio de Defensa Nacional

M D S	Ministerio de Salud
M E P	Ministerio de Educación Publica
M I D E P L A N	Ministerio de Planificación y Cooperación
M I L	Military Specifications and Standards
M I N E C O M	Ministerio de Economía, Fomento y Reconstrucción
M I N R E	Ministerio de Relaciones Exteriores
M I N S E C	Ministerio Secretaria General de Gobierno
M I N T R A T E L	Ministerio de Transportes y Telecomunicaciones
M I N V U	Ministerio de la Vivienda y Urbanismo
M O P	Ministerio de Obras Públicas
M R E	Ministerio de Relaciones Exteriores
M S G P	Ministerio Secretaria General de la Presidencia de la Republica
M T P S	Ministerio de Trabajo y Previsión Social
N A C E	National Association of Corrosion Engineers
N A S	National Aerospace Standards Committee
N C h	Norma Chilena
N F	Normes Française
N I S T	National Institute for Standards and Technology
O I M L	International Organization of Legal Metrology
O L A C	Organization Latino-americana para la Calidad
P A S C	Pacific Area Standards Congress
P D C A	Plan, Do, Check, Action
P R O C H I L E	Dirección General de Relaciones Económicas Internacionales
P N U D	Programa para el desarrollo de las Naciones Unidas
R P C	Refinería de Petróleo Concón S.A.
S A B S	South African Bureau of Standards
S E C	Superintendencia de Electricidad y Combustibles
S E N C E	Servicio Nacional de Capacitación y Empleo
S E N D O S	Servicio Nacional de Obras Sanitarias
S E R C O T E C	Servicio de Cooperación Técnica
S E R N A C	Servicio Nacional del Consumidor
S E R N A P	Servicio Nacional de Pesca
S G S	Sociedad General de Control SGS Chile Ltda.
S N A	Sociedad Nacional de Agricultura
S N C C	Sistema Nacional de Certificación de Conformidad
S O F O F A	Sociedad de Fomento Fabril
S O N A M I	Sociedad Nacional de Minería

S S S A	Superintedencia de Servicios Sanitarios
T C	Technical Committee
T Q C	Total Quality Control
U L	Underwriters' Laboratories
U N E	Una Norma Española
U N I	Ente Nazional Italiano di Unificazione
U S A C h	Universidad de Santiago de Chile
U T F S M	Universidad Técnica Federico Santa María
V A	Value Analysis
V D E	Verband Deutscher Elektrotechniker

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FOREWORD

This Study Report has been prepared by the Japan International Cooperation Agency (JICA) in compliance with the request by the Government of the Republic of Chile. The objective of this is the development of an Industrial Standardization System in Chile.

The Study was executed and the report prepared with the fullest cooperation of, and upon due consultation with, CORFO and INN, the Chilean counterpart of Study and acting as the coordinating entities in all matters concerning the study procedure and the time schedule.

Two separate local surveys in Chile were conducted from March 2 through 28, 1991 and from June 8 through July 7 of the same year, respectively, and a session of meetings was held from November 2 through 16, 1991 to explain the Final Draft Report.

The scope of the Study is not limited to Industrial Standardization, but also covers the peripheral and allied areas essential for the development of such a system. The areas covered by the Study can thus be divided into the following six broad aspects:

(1) Economy
(2) Industrial Standardization
(3) Certification
(4) Quality Control
(5) Inspection
(6) Metrology (Weights and Measures)

The Study was executed on the basis of direct visits to the organizations concerned, including the government offices in charge, universities, companies, and factories, by concentrating on Santiago of Chile. Also included in the geographical scope of this Study was Concepcion, being Chile's 8th Region.

In those areas which the Study Team was unable to visit directly in the course of the Study, questionnaires were sent for self-completion by the respondents.

Thanks to the dedicated cooperation of all concerned, it has been possible to complete these studies smoothly and successfully and to present the Master Plan in this Report Document. The Study Team of the Japan International Cooperation Agency (JICA) wishes to acknowledge the cooperation it has received with sincere gratitude.

The Study Team's thanks are due, in particular, to the following prominent officials for the highest cooperation:

Mr. Hernan Pavez Carcia:	Executive Director, Instituto Nacional de Normalizacion, INN
Ms. Ana Maria Coro Matic:	Head of Standards Division, Instituto Nacional de Normalizacion, INN
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Ms. Leonor Ceruti Mena:	Assistant Chief of Standards Division, Instituto Nacional de Normalizacion, INN
Ms. Elsa Samaniego Espejo:	Chairwoman for the Accreditation of Conformity Certification Bodies on Agriculture Committee, Instituto Nacional de Normalizacion, INN

The Japan International Cooperation Agency also takes this opportunity to state the names and particulars of those of its members who have taken part in the Study and who will be pleased to answer any questions that may arise in connection with this Report.

Kanji Kakinuma:	Team Leader, (Japanese Standards Association)
Ryuichi Sasaki:	Sub-Leader, Metrology System (Japan Machinery and Metals Inspection Institute)
Kazuya Kusakabe:	Standards (Japanese Standards Association)
Shozo Saito:	Quality Control, (Japanese Standards Association)

Katsuhisa Nagai:	Certification System (Japanese Standards Association)
Kunio Sakurai:	Inspection (Japan Machinery and Metals Inspection Institute)
Shinji Nambo:	Economy (Engineering Consulting Firms Association, Japan)
Izumi Sakaya:	In-house Factory Standardization (Engineering Consulting Firms Association, Japan)
Aiichiro Yamamoto:	Project Supervisor (Japan International Cooperation Agency)

CHAPTER 1 BACKGROUND OF STUDY AND PURPOSE

1.1 Background of Study

Chile, a country with rich natural reserves, has traditionally been a raw materials export nation. Its main exports items used to be minerals and agricultural, fishery and forestry products. In recent years, however, Chile has also developed an industry for processing the nation's natural resources, and industrialization efforts are being made with increased investments dedicated to non-traditional industries. An equally steady growth has been seen in the export of industrial products.

While Chile's industries cannot necessarily be considered as having a high standard of technology, and there is also much room for further improvement in the quality of Chile's non-traditional industrial export products. There is much left for Chile to do in order to raise the level of her industrial technology further as time proceeds so as to enhance the value-added content of her natural resources and thus to increase her exports. For the government and public authorities, in particular, it will be of paramount importance to provide the necessary industrial infrastructure as the basis for industrial development.

Industrial standardization (including quality improvement) is one of the vital aspects in the context of the furnishing of an industrial infrastructure. And major efforts are in fact being made also in many other countries of the world to promote industrial standardization.

The advancement of industrial standardization in Chile is primarily in the hands of Instituto Nacional de Normalización (INN), a body founded by Corporación de Fomento de la Producción (CORFO).

Chile's national standards are known as NCh (Normas Chilenas). In principle these national standards are established based on their international counterparts. At present, the body of Chilean standards is comprised of a total of around 1,800 standards. However, those relating to industrial products amount to only about 200 standards. The situation can thus not be described as being wholly satisfactory in meeting the requirements of the nation's private-sector companies and

the general public (consumers). The actual condition is that in many cases, Chile's private-sector companies and testing/inspection bodies resort to international and foreign standards to a large extent. The certification system based on NCh standards does not always function properly. For example, although INN has an accreditation system for certification bodies and a registration system for auditors, the accreditation and registration criteria lack transparency. A further problem is that there is not much demand for products certified under the INN certification system. Chile is also behind in adapting to world trends concerning certification systems.

Interest in quality control by Chile's industrial sector is limited to the big and medium companies engaged in exporting. Those companies which sell their products mainly on the domestic market have generally a low level of interest in quality control.

While testing and inspection facilities are available to some extent in the chemical and mechanical engineering sectors, these facilities are extremely poor in the electrical and electronic fields.

For metrology system, the situation is characterized by a complete absence of a national system with certain calibration services being provided to a limited extent by testing and inspection bodies, the universities and some private-sector companies.

The above observations may be summed up by saying that

(1) National standards (NCh) are neither established nor maintained adequately.

(2) Chile does not possess an adequately functioning certification system based on national standards.

(3) Except for the export-oriented companies, there is generally a low level of interest in, and recognition of the need for, product quality.

(4) Chile's testing and inspection capabilities are inadequate (especially in the electrical and electronic domains).

(5) Chile has not created a national metrology system.

This demonstrates that Chile still faces a large number of problems in developing her own industrial standardization. It is also clear that the difficulties are of a serious nature.

While the Chilean government has at present no codified medium or long-term economic development programs, its policy approach does accord priorities to economic development in certain perceived key areas such as:

(1) Expansion of export of value-added products
(2) Upgrading and diversifying the nation's industrial structure
(3) Technological development
(4) Promotion of medium/small companies
(5) Promotion of education

To achieve these policy targets, the government does not embrace an interventionist approach involving the direct interference in private-sector companies. Rather, its efforts are directed at providing the infrastructural background to create a climate encouraging private-sector companies to work toward the realization of these policy objectives.

The industrial standardization system must respond to these tasks. The fact, however, is that Chile's current situation is fraught with many problems, as has been stated in our earlier report, so that it will be essential to take the appropriate measures designed to provide a more solid infrastructural basis for industrial standardization as a matter of urgency.

Against this background, the Chilean Government decided to formulate a program for industrial standardization system development and called upon the Japanese Government to extend technological cooperation.

Based on this request, the Japanese Government dispatched a preliminary Study Team in September 1990 and agreed on the Scope of Work (S/W) and signed the agreement for the implementation of a full-scale study.

1.2 Objective of Study

The purpose of the present Study is to achieve a more solid industrial base for and in the Republic of Chile and in so doing enhance the international credibility and reputation of Chile's industrial products and ensure greater competitiveness for the nation's industrial output on a worldwide basis, thereby activating the development of Chile's industry and achieving sustained economic growth for the nation as a whole.

Through these efforts, a master plan is to be drawn up for:

(1) the promotion of industrial standardization and in particular for the creation and diffusion of unified national certification system

(2) the propagation of total quality control, including thorough company standardization

(3) the provision of a framework for a metrological system associated with the implementation of the certification system referred to in (1) above.

The primary objectives of this Study can thus be summed up as follows.

(1) A clear appraisal shall be made of the necessary pre-conditions for the present and future development of Chile's economy and clear policy guidelines shall be established defining the short and medium/long-term measures for the promotion of industrial standardization and quality control, including the creation and

propagation of a unified national certification system aligned with the nation's current position.

(2) A clear assessment shall be made of the measures applied so far to industrial standardization and quality improvement through (1) appraisal of the current status of implementation by the government as well as industries and companies, and (2) a critical evaluation based on an analysis of the needs of Chile's industry and companies and the potential for future development, and extracting the problem areas to be addressed in the future.

(3) Based on the policy guidelines thus established and the problem areas thus extracted, concrete measures shall be defined for upgrading industrial standardization in general, and a unified certification system, in particular.

(4) Concrete measures shall be established to ensure that both the government authorities and the industrial sector accept a greater and growing commitment toward quality control so that the recognition of the necessity and effectiveness of quality control will not only be shared by the big companies but also permeates to the medium and small companies and that appropriate methods of quality control will be propagated.

(5) Plans shall be formulated to establish a metrological framework including systems and facilities, which is indispensable for creating and propagating a unified certification system and the diffusion of quality control, covering the government and private sectors.

1.3 Scope and Objective of Study

The Scope of this Study has been explicitly stated in the Scope of Work (S/W) document concerning the full-scale study agreed between the Preliminary Study Team dispatched by JICA and the Government of Chile on October 2, 1990. The slalent items of this Agreement include:

(1) Review of the background

1) Macro-economic condition
2) National and regional development policy
3) Sector policy and present situation of the industrial development
4) Policy and present situation of import and export

(2) Review of industrial structure in Chile

1) Production statistics
2) Employment statistics
3) Investment statistics
4) Identification of promising industries for total quality control

(3) Study on government policies' laws and regulations for the industrial standardization and their future plan

1) Standards development
2) Certification
3) Metrology
4) Quality control

(4) Study on the present situation of standards development and certification systems in Chile

1) Executing organizations
2) Implementing schemes
3) Methods and activities
4) Identification of problems

(5) Study on the present situation of quality control in industries

1) Company standardization
2) Diffusing scheme of quality control
3) Identification of problems

(6) Study on the present situation of metrology development

1) Systems of metrology development
2) Executing organizations
3) Implementing schemes
4) Methods and facilities
5) Identification of problems

(7) Formulation of master plan for industrial standardization

Based on the investigations given under (1), (2), (3), (4), (5), and (6) above, a master plan shall be drawn up for industrial standardization in Chile, covering the following items:

1) Unified certification system
2) Promotion programme to introduce and diffuse the system
3) Promotion programme of diffusing total quality control and company standardization
4) Recommendations for metrological framework related to the certification system

1.4 Regions Covered by the Study

While the scope of this Study comprises the whole of Chile's national territory, the site investigations carried out in the Metropolitan Region of Santiago where administrative bodies, certification bodies, testing and inspection organizations, the universities and other research organizations and establishments concentrate and which accounts for more than half of Chile's economy. In addition, the investigations were also carried out in Eighth Region representing the major industrial locations of the country.

In those areas in which it was not possible to carry out site investigations, surveys were made by questionnaire inquiry.

CHAPTER 2 SOCIO-ECONOMIC PROFILE OF THE REPUBLIC OF CHILE AND PROBLEMS CONCERNING THE NATION'S INDUSTRIAL DEVELOPMENT

2.1 Present Status of the Republic of Chile

2.1.1 Geography and Climate

Located on the southwestern edge of the South American Continent, the Republic of Chile has two mountain formations in its natural relief. The Andes traverse the South American continent in the north-south direction along the border with Argentina. The Cordillera de la Costa runs along the Pacific coast from Arica to near the Taitao peninsula. Between the two mountain formations, Chile has fertile plains in the central region from Santiago to Puerto Montt and a plateau crossing the Tarapaca and Atacama Deserts in the northern part. Chile, an earthquake region, also has a large number of active volcanoes.

With a land surface area of 760,000 square kilometers, Chile is roughly double the size of Japan. The extension of Chile's national territory in the north-south direction is 4,300 kilometers. Compared with this long longitudinal stretch, its width in the east-west direction is very narrow, with the broadest dimension being roughly 400 kilometers and the narrowest section approximately 80 kilometers.

Due to the vast length of Chile's national territory, there are different climate zones which are commonly divided into four.

(1) The desert region: The desert zone in the northern part of the country extends from the Peruvian border to southern latitude 30 . Climatically it is a subtropical region, with precipitation almost nil.

(2) Mediterranean type climate zone: The regions around Santiago have a mediterranean type climate. Under the influence of the Cold Humboldt Current, the summer heat is moderate.

(3) Wooded Zone: Central Chile from Santiago to the Vicinity of Puerto Montt is a warm zone with a moderate climate.

(4) Cold Climate Zone: The southern parts of Chile south of Puerto Montt are characterized by a cold climate which is responsible for the formation of the cold steppes. The Patagonia region and the canal area of the extreme south are marked by continual rainfall throughout the year.

2.1.2 Culture and Society

(1) The population

Chile's population as of June 1990 is estimated as being 13,173,347. Santiago Metropolitan Region, accounts for almost 40% (5.20 million) of the nation's total population. By regions, the populations breaks down as follows:

Table 2-1 Population per Region

Region	Population	Region	Population
1st Region	358,088	8th Region	1,764,243
2nd Region	389,547	9th Region	795,932
3rd Region	197,842	10th Region	922,543
4th Region	486,493	11th Region	80,278
5th Region	1,381,948	12th Region	159,885
6th Region	649,764	Metropolitan	5,236,321
7th Region	840,457		

(Source: INE)

Average annual population growth for the period 1982-90 is given as 1.86%

(2) Racial composition

The Spanish element is the strongest racial grouping, accounting for 75% of the total population, with another 20% being of other European extraction. Only 5% are indigenous. The indigenous tribes of Chile continued, until the end of the 19th century, their firm resistance to the Spanish forces which had intruded their country in the middle of the 16th century. This history of resistance had made the Araucians famous, a minority race whose

number is gradually dwindling. Of all the Latin-American countries, Chile is one of those which have the highest proportion of European races.

(3) Language

Spanish is the most dominant language. In the regions, there are some isolated pockets of Indio settlements speaking their languages. In the south, there are large number of immigrants of German descent, using German as their language.

(4) Religion

Some 90% of the Chilean population is Roman Catholic, and the remaining 10% Protestant. Chile practices religious freedom which is assured by the constitution.

(5) Medical care and health services

The level of medical care is the highest among all Central and South American nations. The Santiago hospitals, in particular, are equipped with the latest, most advanced medical facilities. The health service offers one physician per 930 citizens and one hospital bed per 395 heads of population (as of 1989).

(6) Education

Of all Central and South American nations, Chile has the highest standard of education, with 92.5% of all citizens over the age of 15 being able to read (as of 1987). Elementary education is compulsory for 8 years. Secondary education is for four years, with school attendance for either form of education in 1987 being 100% (for elementary) and 70% (for secondary education), respectively. Higher education is offered by the nation's 23 universities, 24 professional colleges, and 116 vocational training centers. The total level of attendance of these higher and further education facilities is 18% (as of 1987).

(7) The media

Chile has a total of 85 newspapers, with 14 newspapers being published in the Metropolitan Area. The main newspapers include La Tercera (edition of 300,000 copies) and El Mercurio (140,000 copies).

Chile has a total of 341 radio broadcasting stations, with 48 located in the Metropolitan Area. There are a total of 9 television broadcasting stations, five of which are located in the Metropolitan Area.

Since the establishment of the military government in 1973, severe restrictions were imposed on the press and free speech has been subjected to tight control as part of a government policy aimed at sustaining law and order within the country and at preventing subversion. In practice, however, control of expression is most strictly imposed only on television, a form of the mass media that has the greatest impact on the masses. Though the spoken (radio) and written (newspapers etc.) press are subject to some form of restriction or other, some weekly magazines with a limited readership are virtually free from any kind of control.

(8) National characteristics

In terms of its racial composition, marked by an overwhelming predominance of European elements, the traditions and customs of the population have descended from Spain and other west European countries. To this European heritage, Chile has added its own characteristics and features to create the specifically Chilean society. The cultural heritage of Chile's indigenous population has practically no influence on modern Chilean culture today. Encircled by the Andes and deserts, Chile is isolated from the other nations of the South American continent, having a rather weakly pronounced Latin trait and a very steady national character instead.

2.1.3 Political Situation

(1) The political system

Chile's political system is that of a constitutional republic.

The legistrative power belongs to the parliament, which was restarted in March 1990, when the governing power was returned to the civil administration. The parliament is based on a bicameral system, and the upper house consists of 47 members (with a membership term of 8 years, and a half of the members are elected once for every 4 years), while the lower house consists of 120 members (with a membership term of 4 years, and all members are elected once for every 4 years).

The administrative power belongs to the President, who is the head of the country, and the cabinet consists of 20 state ministers appointed by the President.

. Minister Secretary General for Presidency of the Republic
. Minister Secretary General of Government
. Minister of Agriculture
. Minister of Economy, Development and Reconstruction
. Minister of Public Education
. Minister of Finance
. Minister of Foreign Affairs
. Minister of Houses and Urbanization
. Minister of Inner Affairs
. Minister of Justice
. Minister of Labour and Social Insurance
. Minister of Mines
. Minister of National Defense
. Minister of National Properties
. Minister of Public Health
. Minister of Public Projects
. Minister of Transportation and Telecommunications
. Minister of Planning and Cooperation
. Minister Vice President of CORFO

. Minister Vice President of National Energy Commission

The current president of the country is Mr. Patricio Aylwin Azocar who took the presidency in March 1990 (The term of his service will terminate in March 1994).

The jurisdiction is independent from the legislative power and the administrative power, and the juridical system in the country is based on a three-examination system consisting of a supreme court, high courts (16 courts throughout the country) and district courts.

(2) Local administration

After the administrative reform carried out in 1974, the territory has been divided to 12 regions and 1 metropolitan region of Santiago. The regions and the metropolitan region are furthermore subdivided to 51 provinces. Generally, the regions are called with numbers from 1st to 12th from north to south, and names of each region capital are as shown below.

1st Region	Iquique
2nd Region	Antofagasta
3rd Region	Copiapo
4th Region	La Serena
5th Region	Valparaiso
6th Region	Rancagua
7th Region	Talca
8th Region	Concepcion
9th Region	Temuco
10th Region	Puerto Montt
11th Region	Coihaique
12th Region	Punta Arenas
Metropolitan Region	Santiago

Governor of the regions, governors of provinces, and mayors are appointed by the President. The current President Aylwin is going to expand local autonomy, but currently administrative power of

each self-governing body are put under severe restrictions.

(3) Political situation

Among all of the Latin American countries, Chile boasts the greatest degree of political stability, thanks to the long history and tradition of being a parliamentary democracy. In 1970, however, the lawfully established socialist government under Allende was ousted in the military coup d'etat of 1973, at the peak of anarchy and utter confusion of the nation. The military takeover came in response to Allende's precipitated move toward anti-capitalist policies.

The military government under Pinochet was established in 1973 and its basic policy was to eliminate socialism and assert the principles of the free-market economy. The 17 year history following the coup d'etat shows that during this period Chile attained a dynamic rate of economic growth and achieve such favorable results in its economic performance that it must be seen as an exception against the other Central and South American nations riddled with the problems of galloping inflation, high unemployment, and unmanageable cumulative foreign indebtedness. Politically, however, the exclusion of left-wing power in the policy-making (legislative) and executive processes as well as the use of force with detention of political offenders have led to human rights problems that have made Chile the target of international criticism. In a plebiscite held in 1988, President Pinochet lost his vote of confidence so that he forfeited the right to stand for the presidency again. In the following presidential elections of December 1989, Aylwin, the former head of the Christian Democratic Party, (middle-of-the-road left-wing) was elected President.

The start of Aylwin's presidential term on March 1990 marked the return of democratic power in Chile after 17 years. While its policy orientation follows essentially in the footsteps of previous administration by upholding the principles of the free-market economy, in the policy domain concerned with the

democratization of Chilean politics, the Aylwin administration has committed itself to the resolution and clarification of the problems of human rights intrusion by the state during the period of military power. Other areas on which the new administration concentrates are the improvement of the social welfare system and the labor problems.

(4) Foreign policy

The supreme foreign policy objective of the Aylwin administration is to restore diplomatic relations with the socialist countries which broke off normal relations with Chile under the military regime.

In terms of the diplomatic relations Chile has with the various parts of the world, it can be seen that border disputes and contentions over the national territory had existed with Bolivia, Peru, and Argentina. The border disputes with Argentina have now been completely resolved and those with Peru are virtually settled. The problems with Bolivia, however, are still unresolved and diplomatic relations with Bolivia have still not been established. Since diplomatic inauguration of the Aylwin administration in March 1990, however, relations with Mexico, which had broken off since 1974, has been resumed.

The military administration and the human rights problems it has created came under heavy criticism from the Western European nations so that Chilean-West European relation remained "chilly" during the period of military rule. With the return of democratic power, relations improved. The East European Socialist Block countries (i.e., the Soviet Union, the German Democratic Republic, Poland, Czechoslovakia, Hungary, and Yugoslavia) which had broken off diplomatic relations with Chile from the establishment of the military regime, restored them in March 1990.

Chile's relations with the United States are poised toward improvement following the hand over of power to a democratic government. The U.S. government has lifted the export ban on

weapons and arms it has imposed on Chile and has taken the decision to re-apply its general preferential tariffs to Chile.

(5) National defense

The national defense system is comprised of four forces, the Army, Navy, Air Force, and the armed police force. Chile's armed forces total 101,000 men, 33,000 of which are conscripts. The manpower strength each of the forces has is given as: 57,000 men for the Army, 29,000 men for the Navy, 15,000 men for the Air Force, and 27,000 men for the police force. Under the conscription system, all males aged 18 or over are liable to being called up for military service for a period of two years.

2.2 Economic Situation

2.2.1 Recent Economic Trends

While most Central and South American nations suffer from economic stagnation and are drawn into economic crises, the Chilean economy is an exception to this as it has maintained its favorable profile for the last few years. The essence of the economic policies that have helped Chile achieve this success may be attributed to the adoption of a private sector led, free-market style policy, in other words, an economic package giving freedom to trade and the inflow of foreign capital and favoring the privatization of state enterprises.

After Pinochet's military rule for 17 years, the economic policy of the new democratic administration under President Aylwin does practically follow in the footsteps of the free-market economy of the previous administration. The most important measures under this economic policy are as follows.

Promoting a free-market type liberal economy led by the private sector, with greater weight being given in the role of the state if and when required.

While aiming for a redress of the income differentials and an expansion of the social welfare system, the financial resources needed to implement these policies will have to come from increased tax revenue achieved through a reform of the tax system.

Another objective is to boost the status of workers through a reform of the Labor Laws.

In connection with efforts to reduce Chile's foreign indebtedness, the government tries to lessen the burden for the nation by sharing the responsibility for the financial obligations with the holders of bonds. A review of the state enterprises is underway to privatize or nationalize only if approval of the organization concerned has been obtained.

Measures are taken to promote the inflow of foreign capital which should contribute to the economic development of Chile.

After the Chilean economy had sustained growth for a some time, it began to show signs of overheating in the middle of 1989. This led to policy measures early in 1990 to throttle the economy. As a result, the rate of economic growth marked a substantial drop to only 1.6% in 1990. The rise in the consumer price index exceeded the initially set target of 25% and reached 27%. At the same time, the rate of unemployment was 0.6 points up on the previous year to reach 5.6%.

It is difficult to forecast the future turn of the economy as this will depend on a number of factors. The biggest problem is the rise in crude oil prices due to the Gulf War. Chile depends on imports for 85% of its petroleum demand, so that the significance of international oil prices for the nation's economy is only too apparent.

There are new government amendments to the Tax Laws and Labor Legislation. And since the difficulty of forecasting the Chilean economy has forced companies to streamline management in the pursuit of greater efficiency, there is the likelihood of increased unemployment to consider. Despite these many disturbing factors, copper, the major

export item of Chile, continues to fetch a high market price. Through the establishment of the Petroleum Stabilization Fund, Chile has revealed its optimistic attitude, by refusing to pass the higher petroleum prices on to the consumer.

The government's economic forecast for 1991 is as follows:

Inflation rate:	15 - 20%
Rate of economic growth:	5%
Cooper price:	97 cent/pound
Trade balance:	680 million US dollar surplus
Current account balance:	2 billion US dollar deficit
Capital inflow:	1.7 billion US dollars
Foreign currency reserves:	100 million US dollars

2.2.2 Changes in the Macroeconomy

(1) Economic growth, inflation and employment

In the period from 1978 through 1981, Chile's GDP attained solid growth at an average annual rate of 7.5%. In 1982, however, the economy swung into negative growth, with a significant minus rate of 14.1%. This was due to the dramatic increase in imports following the liberalization of imports which opened the floodgates for foreign products entering Chile as well as the liberalization of capital. Another factor was the increased number of bankruptcy cases as a consequence of the nation's inflated indebtedness both domestically and toward the international community. From 1984, however, the economy was restored and by 1989 Chile's GDP was back to steady growth at an average annual rate of 6.2%. Yet, as mentioned earlier, with economic growth down to a small rate and high inflation combined with a high rate of unemployment, the economy suffered in 1990.

Chile's GDP per head of population is given, by the World Bank's statistics, as 1,510 US dollars (as of 1988) so that Chile ranks as one of the low-level medium-income nations. Taken over the

period from 1965 through 1988, however, the average rate of the growth of GDP per head is a mere 0.1%.

Consumer price index rose at a rate of under 25% in any of the years from 1986 through 1989. Thus, consumer price increase in Chile has relatively been low as compared with other Central and South American countries. The rate of unemployment remained on a falling trend, reaching a level short of 10% from 1986.

Table 2-2 Main Economic Indices

	1985	1986	1987	1988	1989	1990
Real DGP (1977 Prices - billion pesos)	356.4	376.6	398.2	427.5	470.2	480.3
Real GDP growth rate %	2.4	5.7	5.4	7.4	10.0	1.6
Rate of increase in consumer index price	26.4	17.4	21.5	12.7	21.4	27.3
Rate of increase in wholesale index price	43.4	19.8	19.2	5.9	15.1	25.7
Rate of unemployment %	11.9	8.8	7.9	6.3	5.3	5.6

(Source: Central Bank)

(2) Structure of Chile's industry

Analysis of the development of the composition of Chile's GDP by industrial sector shows that a share expansion in the nation's GDP has been recorded in recent years by the agriculture, fisheries, and forestry sector, the building and construction industry, transport and communication. Conversely, the mining sector showed a contraction in its contribution to the nation's GDP. This development is due to the measures taken in recent years to diversify export products, with a growth in Chile's non-traditional export products (that is, products other than mining output which has traditionally centered on copper), i.e. agricultural products, food processing, timber and allied products.

The following table is an overview giving the breakdown of the share contributions of the various industrial sectors to the nation's GDP.

Table 2-3 GDP Share by Industry

(Unit: %)

	1980	1985	1990 (Share)	1990 (Value)*
Agriculture, forestry, stock farming	6.7	8.6	8.3	40.0
Fisheries	0.5	1.0	0.8	4.0
Mining	8.4	8.7	7.4	35.4
Manufacturing industries	21.4	20.4	20.6	99.0
Electricity, gas, water	2.1	2.6	2.5	11.9
Building & construction	5.2	5.8	5.9	28.2
Commerce	16.3	16.7	18.1	86.7
Transport and communication	4.9	5.6	7.0	33.4
Other service sectors (Finance, real estate, public service, education)	33.9	30.6	29.5	141.9
Total	100.0	100.0	100.0	480.3

Note *: Billions of 1977 Ch.$
(Source: Central Bank)

(3) Expenditure on GDP

As for breakdown of GDP in the aspect of expenditure, the ratio of final consumption expenditure of households has been high consistently, and the ratio has been becoming lower year by year, but was still somewhat lower than 70% in 1990. Also the percentage of fixed capital formation has been becoming higher year by year since 1986, which indicates that investment in Chile has been made actively in recent years.

Table 2-4 Percentage Share of Expenditure on Nominal GDP

(Unit: %)

	1980	1985	1990
Final consumption expenditure of households	70.8	69.3	57.1
Government final consumption expenditure	12.5	14.2	9.7
Gross fixed capital formation	16.6	14.2	19.5
Variation in stocks	4.3	-0.5	0.8
Exports of goods and services	22.8	29.1	36.6
Imports of goods and services	-27.0	-26.3	-33.7

(Source: Central Bank)

2.2.3 International Trade, Balance of Payments and External Debts

(1) Balance of payments

Structurally, the Chilean balance of payments is characterized by a large amount of financial service payments such as interest payments, resulting in a chronic deficit in the nation's invisible trade balance. Though the balance of trade is constantly in credit, the invisible trade balance shows a larger margin of deficit than the trade balance's credit margin so that the current accounts are in deficit.

Table 2-5 Balance of Payments

(Unit: Million US dollars)

	1986	1987	1988	1989	1990
Current accounts	-1,137	-808	-167	-767	-790
Trade balance	1,100	1,229	2,219	1,578	1,273
Export (FOB basis)	4,199	5,223	7,052	8,080	8,310
Imports (FOB basis)	3,099	3,994	4,833	6,502	7,307
Invisible trade balance	2,321	-2,163	-2,563	-2,560	-2,262
Transfer accounts	84	126	177	215	199
Capital accounts	821	944	1,009	1,278	2,650
Errors and omissions	88	-91	-110	-74	508
Overall balance	-228	45	732	437	2,368

(Source: Central Bank)

(2) International trade

After the 18.1% drop in exports in 1981, the export accounts up until 1985 showed a repetition of minor increases and decreases. From 1986, however, they achieved a sound rate of growth associated with the recovery of the economy. In 1988, the copper price escalated and Chile's non-traditional product exports, including mainly products from the agricultural, forestry and fisheries sectors, rose favorably so that exports overall recorded a substantial growth rate of 35.0%. This growth was maintained also in 1989, when the export growth rate stood at 14.6%. Chile's main export products are mining output, with copper accounting for the overwhelmingly largest share. Due to the government's efforts to diversify the export product mix, Chile has seen an increase in the export of industrial products and agricultural products, including in particular fresh fruit. As a result, the share of copper in Chile's total exports dropped sharply from the 70% level it had in the 1960s to 41% in 1987. The escalation in copper prices, however, resulted in a share increase (in value terms) from 47.9% in 1988 to 49.6% in 1989.

After the sharp increase in imports from 1975 through 1981, the recession in 1982 and 1983 brought a dramatic drop in imports (57% down on a cumulative basis). With the recovery of the economy in 1984, however, imports rose again at a rate of 18%. The substantial devaluation of the Chilean currency in 1985 was one of the major factors for the 12% drop in imports of that year. After 1985, imports were on a rising trend, with growth rates in imports recorded at 28.9% in 1987 and 21.0% in 1988. At the end of 1989, Chile had a presidential and a general parliamentary election. In the economic program announced by the presidential candidate Aylwin, the expansion of the social welfare system was given as a priority area in the election campaign. As a source for the revenue need to finance this welfare package, Aylwin had indicated a variety of fiscal measures including an increase in taxation on luxury goods. The result was a rapid increase in the importation of consumer durables, including in particular automobiles and electric household appliances. Imports in 1989 thus rose by 34.5%

as compared with the previous year.

Chile's main export and import trading partners are the United States of America, Japan, Germany, and Brazil. Chile has been making strenuous efforts to expand trade with Asian countries. Especially the country has a strong interest in the vast Japanese market. However, most of goods the country is exporting to Japan are raw materials such as minerals including copper, fish and woods, and few highly manufactured products, which can be regarded as true "industrial products" are not included in the exported goods.

Table 2-6 Value of Exports and Imports by Major Product Category (1986 - 1989)

(Unit: Million US dollars)

	1986	1987	1988	1989
Export (FOB)				
Mining Output	2,096.1	2,603.3	3,848.3	4,472.8
Copper	1,751.7	2,234.7	3,416.2	4,021.4
Iron	88.4	100.9	109.7	124.0
Potassium nitrate/iodine	92.3	98.7	121.4	130.0
Molybdenum	97.6	99.8	108.0	113.0
Gold	161.4	223.5	255.6	259.2
Silver	67.9	80.3	82.8	90.3
Agriculture - Cattle Farming - Fisheries	683.0	796.3	930.4	994.5
Agriculture	563.0	613.8	691.2	711.1
Dairy products	39.4	56.1	58.0	51.5
Forestry products	1.7	2.6	2.6	4.7
Fishery products	78.9	123.8	178.6	227.2
Industrial Products	1,419.7	1,824.1	2,273.1	2,612.7
Food	511.3	618.1	757.5	851.3
Fish powder	315.1	362.5	458.8	507.8
Wine/beverages	19.1	25.8	32.3	43.3
Wood products	135.0	217.3	310.8	344.9
Paper and pulp	272.4	365.2	416.9	422.3
Primary metals	280.8	348.9	382.6	414.7
Total	4,198.8	5,223.7	7,051.8	8,080.0
Imports (CIF)				
Consumer goods	422.0	584.1	563.3	913.1
Capital	670.1	981.5	1,316.9	1,916.7
Intermediates	1,822.2	2,227.7	2,821.6	3,666.0
Sub-Total	2,914.4	3,793.3	4,701.8	6,495.8
From the Free Trade Zone	242.5	230.0	222.2	238.4
Total	3,156.9	4,023.3	4,924.0	6,734.2

(Source: Central Bank)

Table 2-7 Value of Exports and Imports by Main Countries (1986 - 1989)

(Unit: Million US dollars)

	Export (FOB)				Imports (CIF)			
	1986	1987	1988	1989	1986	1987	1988	1989
Latin America	717.3	866.5	925.0	996.1	737.5	955.7	1,364.6	1,764.2
Brazil	292.9	348.2	341.7	522.6	247.6	380.0	554.9	703.1
Argentine	160.6	174.9	168.1	110.1	122.5	159.0	278.6	398.8
Peru	65.9	85.8	63.0	54.9	56.3	27.9	33.0	63.2
Colombia	40.5	51.0	57.8	81.9	38.3	99.6	126.5	145.1
Ecuador	28.1	32.6	35.4	28.7	58.8	37.2	55.2	89.2
Venezuela	40.6	71.2	105.0	33.2	148.2	143.7	165.0	166.8
North America	973.6	1,211.7	1,441.4	1,521.4	695.8	839.5	1,112.8	1,454.6
USA	915.2	1,140.5	1,393.2	1,456.0	641.5	773.1	1,002.1	1,347.9
Western Europe	1,584.5	1,832.9	2,883.7	3,192.7	833.8	1,090.6	1,235.0	1,623.8
Germany	441.2	483.4	817.9	914.3	250.1	335.1	365.1	482.9
United Kingdom	219.8	317.8	365.6	499.0	88.5	128.3	123.3	151.5
Italy	215.8	273.8	452.5	409.9	64.0	129.3	120.3	153.2
France	153.1	178.6	353.7	392.9	94.1	95.8	149.6	223.3
Spain	122.2	146.8	178.4	222.5	82.2	116.6	117.9	157.2
Eastern Europe	41.7	44.2	77.1	69.8	8.4	14.0	33.0	45.8
Asia	819.8	1,035.5	1,594.6	2,091.4	446.8	700.1	733.8	1,197.0
Japan	420.1	561.3	881.3	1,120.5	296.4	387.2	391.8	737.0
China	100.2	78.7	99.1	104.1	21.0	57.1	55.0	47.8
South Korea	91.8	109.0	146.1	257.5	48.0	82.2	107.5	164.6
Middle East	75.5	82.9	90.3	84.6	38.0	42.6	33.7	50.6
Africa	32.5	36.0	39.9	98.9	86.8	132.2	198.2	291.0
Total	4,222.4	5,101.9	7,048.3	8,192.7	3,156.9	4,023.3	4,924.0	6,734.2

(Source: Central Bank)

(3) Foreign debts

Based on the economic policies agreed with the IMF, Chile is one of the few countries reducing their external debts. In 1989, Chile's external debts amounted to a total of around 17.7 billion dollars (including IMF loans). This is clearly down on the 1988 peak when external debts reached 20.8 billion dollars. The fact does remain, however, that the nation's total indebtedness stands at an enormous level. In 1988, debts were equivalent to 96.6% of Chile's GNP and to 232.5% of the value of goods and service exports. Measures are considered to enhance the nation's foreign currency earning capacity by diversifying the export mix and/or adjusting the demand for foreign currency for import purposes and the repayment of external debts.

Chile is the first country adopting a systematic approach to the reduction of external debts by swapping debts for equity.

Table 2-8 Chile's Foreign Debts (1987 - 1989)

(Unit: Million US dollars)

	End of 1987	End of 1988	End of 1989
Total amount outstanding	19,208	17,638	16,571
Public sector debt	16,380	14,692	12,606
Private sector debt	2,828	2,946	3,965
IMF load	1,452	1,322	1,167

(Source: Central Bank)

2.2.4 Direct Foreign Investment in Chile

(1) Policies for direct foreign investment

In order to activate the economy and promote introduction of technologies from foreign countries, the Chilean government is very active in introduction of foreign capital, and has followed very liberal policies for it.

The policies can be summarized as described below.

- They do not discriminate foreign investment from domestic one, and deal with foreign capital equally.

- There is no restriction concerning the field for direct foreign investment.

- There is no restriction on investment ratio, and the investment ratio of foreign capital may be up to 100%.

- Divided of profit and redemption of capital can be made freely after a specified period of time has passed since the investment was made.

As governmental institutions dealing with problems concerning foreign investment, there are CIE and CORFO Investment Promotion Office.

The Foreign Investment Committee is the only official institution representing Chile which authorizes foreign investment and decides terms and conditions for each contract, and this committee is constituted by MINECOM, MDH, MRE, MIDEPLAN, and the President of Central Bank. Investment project with value of more than 5 million dollars, and those in specified fields require previous approval of a chairman of the committee and permission of the secretary general of the committee. The committee does not specify any industrial sector in which investment would be authorized preferentially, and it is said that there is not any specific industrial sector or field where the authorization is preferentially given or is especially difficult in the actual process of examination of the applications for investment. CIE has overseas offices in Zurich, New York and Tokyo. Their activities include PR and information gathering to promote investment in Chile.

On the other hand, the Investment Promotion Office, which is an institution of CORFO, in order to set up joint venture companies with capital of 5 million dollars or less by foreign and local

companies has been making such activities as opening an investment promotion agency in some European countries (funded by governments of partner countries), searching for partner enterprises, supplying or lending a portion of project capital by making use of IDB finance fund, and PR activities including seminars for medium-scale industries in Chile. There is no specific restriction on industrial sectors of joint venture companies to be set up.

(2) Trends of foreign investment in Chile

A basis of a legal framework for introduction of foreign capital from overseas countries into Chile is the Foreign Investment Law (No. 600), and in addition to it, there is a way of foreign investment in Chile through a debt equity swap system (Foreign exchange rule No. 19) which was introduced in 1985 for the first time in the world.

As for direct foreign investment via the Foreign Investment Law (See Table 2-9), the value of investment in Chile increased to 1.1 billion dollars, 26% up from the previous year. Remarkable facts are that the growth rate in service sector reached 144%, and that the value of investment rapidly increased in transportation, forestry and fishery. However, mining is the largest sector, sharing 46% of all accumulated investment from 1982 to 1990, followed by the services (31%) and the manufacturing (20%). As for foreign investment by country of origin that from the United States has been the largest on the cumulative basis from 1985, but as far as investment in 1990 is concerned, Canada was the largest investor.

Table 2-9 Materialized Foreign Investment via Law No. 600

(Unit: Million US dollars)

	1987	1988	1989	1990	Cumulative (1982-90)
Service	131	321	153	380	1,336
Manufacturing	234	102	126	84	877
Mining	125	358	604	629	2,006
Agriculture	2	2	7	6	63
Construction	3	3	7	7	42
Transportation	0	0	0	3	9
Forestry	0	0	0	18	21
Fishery	1	0	0	6	7
Total	497	787	898	1,132	4,362

(Source: Foreign Investment Committee)

On the other hand, investment via the Exchange Rule No. 19 increased until 1989 year by year, but because a merit of this system for investors became small recently, the investment drastically shrunk in 1990. (See Table 2-10.)

Table 2-10 Materialized Foreign Investment via Exchange Rule No. 19

(Unit: Million US dollars)

Year	1985	1986	1987	1988	1989	1990
Value	43	300	677	890	1,317	426

(Source: Foreign Investment Committee)

2.2.5 Regional Economy

While the arid zone in northern Chile is not suitable for agriculture, the Acatama Desert occupying the largest part of this zone, is rich in mineral deposits. Potassium nitrate (saltpeter) made a substantial contribution to the national economy in the past, as copper does at present. Industrial activity concentrates on the central part of Chile with a moderate, inland climate. The metropolitan area around Santiago in particular, is the center of the nation, with some 40% of the nation's entire population and industry,

and some 80% of the nation's finance being concentrated in this region. Agriculture is equally concentrated in a limited zone extending from the fourth to the 10th regions. These regions account for 95% of Chile's agricultural output. In the south, the cold climate with continual rainfall has favored the development of forestry. Yet, the population has drifted away from the extreme south which has an inadequate infrastructure with a poor traffic network. Chile made territorial claims on the Magellan Strait, but these border disputes with Argentina have now been resolved. The economic development with the construction of methanol, ammonia and urea plant capacity mainly in the oil and gas field areas of this region is thus of the greatest interest.

Table 2-11 shows the Gross Regional Product by (administrative) Region and the Gross Regional Product per head of population (for 1984), while Table 2-12 shows the Gross Regional Product by industry. The percentage of mining is relatively large in 2nd, 3rd, 6th and 12th regions which are abundant in natural resources. On the other hand, the percentage of manufacturing industry is high in 1st, 5th, 8th and Metropolitan regions.