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THE AMERICAN COPPER COMPANIES AND THE CHILEAN GOVERNMENT, 1920-1967.  
PROFILE OF AN EXPORT SECTOR

by

Markos Mamalakis

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INTRODUCTION\*

"He who controls copper controls Chile."  
Radomiro Tomic, Ambassador to the U.S.,  
Senate 1965, p. 55.

"Anaconda owns half of Chile." Contreras  
Labarca, Senate 1965, p. 36.<sup>1</sup>

After a decade of stagnation the Chilean economy entered, in 1960, a period of healthy growth. The Christian Democratic party, which took control of the government machinery on September 4, 1964, has been contemplating wide-scale reforms in an effort to accelerate this growth by removing the existing structural bottlenecks. The New Copper Laws, which would introduce an output expansion and joint ownership by the Chilean government and the American-owned Gran Minería,<sup>2</sup> are a cornerstone of these reforms.

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\*The Chilean Ambassador to the United States, Radomiro Tomic and Raymond Mikesell read and made useful comments on an earlier draft of this essay. I also benefited from interviews with functionaries of the Anaconda and Kennecott, the two American Companies, which up to 1966 had exclusive control and ownership of Chilean large-scale copper mining.

<sup>1</sup>The Spanish version of the first quote is "El que controla el cobre controla Chile," and of the second, "La Anaconda es dueña de medio Chile."

<sup>2</sup>For simplicity reasons, the large-scale foreign-owned Chilean copper mines will be referred to in the future as Gran Minería, the way they are commonly known in Chile. Also, when we talk about mining in the second and third parts of the essay we will have the Gran Minería in mind.

The New Copper Laws, which by August 1967 have been approved both by the House and the Senate, are the most recent rungs in the ladder of Chilean mining and overall economic development. As a phenomenon, they have to be viewed as part of the long-run historical scene and development efforts. In this essay I will present what I consider to be the highlights of the relation between government and the Gran Minería, and the most important aspects of the relation between mining and overall growth.<sup>1</sup>

The essay is divided into three parts. In the first, which is mainly historical, the treatment of copper mining is traced through three different stages. In the second, the relation of copper mining and growth and the government's influence on this relation are presented. The third part relates copper mining to the savings - investment process.<sup>2</sup>

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<sup>1</sup>Large scale Copper Mining (Gran Minería) was defined in Article 1 of Law 11.828 of May 1955, signed by President Carlos Ibáñez del Campo, to include those firms producing not less than 25,000 metric tons annually of blister, fire-refined or electrolytic copper. The only firms possessing these characteristics are the Chile Exploration Company, which exploits the Chuquicamata mine; Andes Copper Mining, which was exploiting the mine at Potrerillos and currently, that of El Salvador; and Braden Copper Company, owner of El Teniente Mine.

<sup>2</sup>The documents used most extensively in the present essay are the following: República de Chile, Boletín Num. 21.773, Senado. Informe de las Comisiones de Hacienda y Minería, Unidas, Recaido en el Proyecto de Ley de la Honorable Camara de Diputados, que establece Normas Sobre Producción, Manufactura y Comercio del Cobre (Santiago, Chile: Instituto Geográfico Militar, 1965). Pp. 1-95, and Apéndices, Pp. 1-157. This document, which will be referred to henceforth as Boletín Numero 21.773, Senado, contains the most complete official statistical information concerning copper and large scale copper mining ever published in Chile. It also includes very informative Senate discussions, detailed projections for copper output, and an historical review of the copper industry. Mario Vera Valenzuela, La Política Económica del Cobre en Chile, (Santiago, Chile: Universidad de Chile, 1961), pp. 1-223. This study, which will be referred to in the future as Política Económica, analyzes all the problems facing the Gran Minería and offers an unmatched, up-to-date amount of information about the copper industry.

Vera's book, which is of polemic nature, attempts to prove that the Chilean

<sup>2</sup>(Continued from preceding page) government's copper policy, both in the past and in the present, has been inefficient and detrimental to the economy. It is indispensable for a reader who wants to form an objective view of the problems of American-owned copper mining, to compare and contrast Vera's "Chilean view" with the orthodox view presented by Clark Reynolds in "Development Problems of an Export Economy: The Case of Chile and Copper", M. Mamalakis and Clark Reynolds, Essays on the Chilean Economy (Homewood, Illinois: Richard D. Irvin, Inc., 1965), pp. 201-398. This essay contained, up to the publication in 1965 of the Boletín Num. 21.773, Senado, the most complete time series information concerning the Gran Minería. In the future it will be referred to as Copper. Essays. Although the majority of the statistical information used in this present essay has been extracted from the official document Boletín Num. 21.773, Senado, I have crosschecked it with the Reynolds information and found only a few discrepancies. The Reynolds essay, with its large descriptive section, is indispensable for those who cannot read the extensive and high quality Spanish literature and also brings to the English audience the long-celebrated Chilean concept of "returned value" (retornos). Although my statistical appendix on mining, and especially its section on copper (see the forthcoming Historical Statistics of Chile, 1840-1965), contain the most complete aggregative statistical information available for the respective sectors, the Reynolds essay remains the major source of disaggregative statistics covering the three large-scale American-owned copper companies up to 1959. Furthermore, an adequate understanding of the "copper problem" will be facilitated by reading Anibal Pinto Santa Cruz's Chile, Un Caso de Desarrollo Frustrado (Santiago de Chile: Editorial Universitaria, S.A. 1962) which is a treatise of Chile's long-run development problems; and Markos Mamalakis' "Public Policy and Sectoral Development. A Case Study of Chile, 1940-1958" in Essays on the Chilean Economy, op. cit., pp. 1-200, to be referred to subsequently as Public Policy, Essays.



PART I

Freedom, Discrimination, Equity: The Shifting Game

Pattern between Government and the American Copper Duarchy

The history of copper mining is presented here mainly from the standpoint of the treatment this sector received by government. The major relevant highlights of overall economic growth are also presented, especially if they are akin to the "copper issues".

The relationship between government and copper mining has passed through three distinct phases: the laissez-faire one<sup>1</sup>, the period of discrimination, and more recently, the one of equitable treatment.<sup>2</sup>

First Period: Laissez-faire. 1880-1939

At the very beginning of this period, Chile ceded its place as the world's most important copper producer to the United States, and, on the domestic scene, copper was replaced as export commodity number one by nitrate. The War of the Pacific coincided with the slow exhaustion of the rich copper ores found in the country's Central Regions and marked the beginning of a prolonged decline in nationally produced copper output; the mediana (medium) and pequeña (small-scale) minerías of copper were unable to pass to large scale production and stagnated. Lack of internal technological change, absence of a modern, technology-oriented capital goods sector,

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<sup>1</sup>For a highly competent analysis of the copper sector during this period see Santiago Macchiavello Varas, El Problema de la Industria del Cobre en Chile y sus Proyecciones Económicas y Sociales (Santiago de Chile: Imprenta Fiscal de la Penitenciaría, 1923) Pp. 1-348.

<sup>2</sup>The three-phase analysis of the sector adopted here replaces the six-phase analysis first introduced in the publication by the Departamento de Cobre, Asesoría Comercial, El Cobre en Chile (Santiago, Chile: Depto de Cobre, 1961), and also used by Clark Reynolds in Copper. Essays, op. cit., p. 209.

limited capital markets and, maybe even lack of organizational capacity on the part of the Chileans gave rise to what Adrian Palomino and Santiago Macchiavello have called a "denationalization" of the industry;<sup>1</sup> ownership was transferred from Chileans to, mainly, Americans in a pattern inversely related to the copper content of the minerals.<sup>2</sup> Macchiavello laments the "moslem complacency" of the Chileans with respect to the denationalization phenomenon and concurs with Santiago Marín Vicuña in attributing it to the lack of "men and will power".<sup>3</sup>

Large-scale copper mining which was only slowly established after 1910, had led by 1918 to a reduction of the Chilean-owned share of copper production to an incredibly low 4.47 per cent, from a level of 90 per cent in 1876.<sup>4</sup>

Still, copper did not loom large in the Chilean economic profile, which was totally dominated by the nitrate bonanza; this was indeed the nitrate era. The developments in this key export sector shaped the economic, institutional, and social structure of the country, and had an unmistakably profound impact upon the governmental treatment of copper mining following the Great Depression.

Mining carried, mainly as a result of the nitrate boom, functions previously, or in other historical experiences, born by agriculture. It

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<sup>1</sup>See Santiago Macchiavello, op. cit., pp. 105-117.

<sup>2</sup>See Santiago Macchiavello, op. cit., pp. 105-117.

<sup>3</sup>On page 111, Macchiavello quotes Marín in saying: "no sean capitales los que faltan, sino hombres y decisión" (it is not so much the lack of capital as that of men and will power). This transfer has to be, nevertheless, explained as a result of the numerous forces including lack of capital and contact with international investment consortia.

<sup>4</sup>See Santiago Macchiavello, Ibid., p. 106.

provided between 1880 and 1930, directly or indirectly, the lion's share of government revenues; and, unwittingly, by contributing as much as 75 per cent of the total revenues, it established a tax freedom, or stated better, immunity of, the previously burdened agriculture and other sectors an immunity which they subsequently refused to surrender. Even the Gran Minería of Copper paid only a token amount of taxes and was subjected to a minimum of government intervention. On the positive side, the release of the vast product "surplus" of the nitrate sector through taxation and voluntary saving led to high government investment and establishment of an infrastructure in transportation, utilities, and education.

Furthermore, mining acted as the agent earning foreign exchange to be used in satisfying the country's import needs. As a percentage of domestic product mining exports amounted to almost 30 per cent, and were also unusually high in absolute value; and the country's capacity to import was further strengthened by heavy, nitrate-induced capital inflows to both the private and public sectors. Mining, thus, rather than agriculture, served as the link between the Chilean incomplete system, which was forced to import an increasing amount of capital goods (practically all machinery and equipment), and the capital-goods-exporting developed complete systems. By making available the foreign exchange needed for such purchases, it functioned as a quasi-capital goods sector.

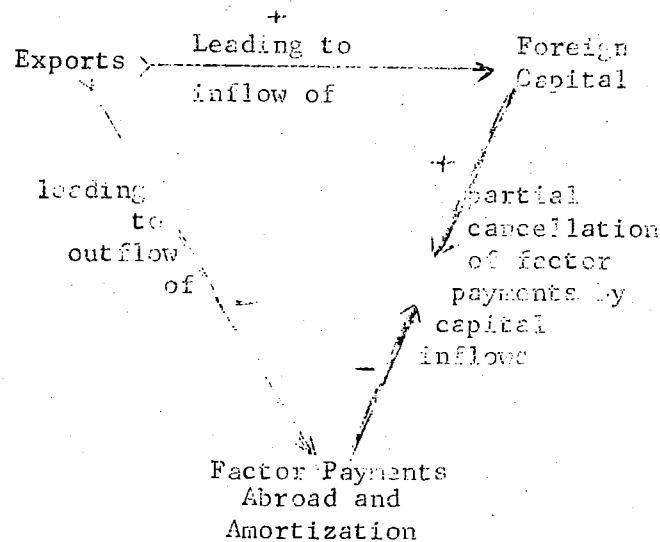
Cum multis aliis, mining was a major and rising employment source. Its boom gave rise to a labor shortage in the economy as a whole and to complaints of rising labor costs following labor migration out of other sectors.<sup>1</sup> It

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<sup>1</sup>See Santiago Macchiavello, op. cit., p. 223.

was not only an export sector but also a leading one which, with the very labor intensity of its operations, had a major employment effect, and accounted for the extensive linkages with the rest of the economy.

Nothing, however is costless and the direct price Chile had to pay for the mining export boom was reflected and measured by the high factor income paid abroad. Fortunately the laissez-faire system permitted the establishment of a triangular relationship between exports, factor payments abroad, and capital inflows; this relationship was strong, sustainable, and in many ways beneficial to Chile. The export boom was associated with high profits; these, in turn, were automatically linked with high repatriated payments to



foreign factors of production. Thus, the beneficial effects of the influx of export revenues were strongly mitigated by the severe "factor income" leakage<sup>1</sup> from the Chilean economic organism. But, furthermore, booming

<sup>1</sup>In his Monetary Problems of an Export Economy, Henry Wallich argued that in "an export economy....exports and imports respectively assume the roles that, in an investment economy like that of the United States, are played by investment and saving. Exports rather than investment are the main generating force in the national income; imports rather than saving represent the main leakage from the income stream." p. 16. In the model of the present essay, the major leakage is factor payments abroad, and not imports

exports and profits created the climate and incentives for heavy foreign capital inflows, which to a large extent offset the negative impact upon imports of the leakage related to payments to British and American capital. In a way, and especially during the 1920's, heavy factor payments were facilitated by the equally heavy nitrate-induced inflows of foreign capital.

Last, but not least, important has been the vast unilateral transfer of resources from the North, where the nitrate oficinas were located, to the Center of Chile. This resource surplus transfer permitted the development of an urban-service economy and establishment of a prosperous middle-class living beyond the means of the Center but within the means of the country.

The laissez-faire period came slowly but steadily to an end in the period following the Great Depression of the 1930's. Government faced a new situation. Nitrate collapsed and permanently disappeared from the scene as a major export sector and, along with it, terminated the period of easy government revenues and heavy foreign private capital inflows.

Second Period: Suppression and Discrimination. 1940-1955.

During the early nineteen thirties, copper eclipsed nitrate as the major export industry, and, in the early forties, as the single most important source of government revenue. The collapse and permanent stagnation of nitrate signalled the end of the era of large and easy foreign exchange and government revenues, which started with the War of the Pacific. Moreover, the economy experienced a population explosion, accelerating inflation

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<sup>1</sup>(continued from preceding page) in general. Furthermore, although I agree that exports assume the role of investment in "dependent economies" under a gold-standard or related system, in the larger Latin American economies that have been plagued by inflation since 1930, and especially in Chile, the roles and functions of the export sector are far more complicated as it will be pointed out in the second and third parts of this essay.

and an increasing degree of government intervention.

As regards large-scale copper mining, the most important event was the increasing descrimination to which it was subjected as a result of government's efforts to accelerate growth through industrialization. The coalition between Government, Central Bank, and the industrial consumer goods sector led to suppression of mining and eruption of what the present author has called sectoral clashes.<sup>1</sup>

The nature, strength and growth implications of suppression<sup>2</sup> of the copper sector will be analyzed later in this essay. At this moment, we only present a summary of the social, political and economic underpinnings of discrimination.

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<sup>1</sup>For a complete presentation of the theory of sectoral clashes see the present author's La Teoría de los Choques entre Sectores (Santiago, Chile: Instituto de Economía, Universidad de Chile, March 1966); and also Markos Mamalakis, "La Teoría de los Choques Entre Sectores", El Trimestre Económico, Vol. 130, April 1966.

<sup>2</sup>According to the foreign capital and conservative viewpoint, the copper companies were Chile's "whipping boy". On the other extreme, the American copper sector is viewed as an agent of imperialism exploiting poverty-stricken Chile. As it is normally the case, the truth lies in the middle. The foreign-owned copper concerns have by no means been used as a scapegoat for all of Chile's economic ills, even though suppression of the sector, as defined in the theory of sectoral clashes, was present during most of the 1940-1955 period. Furthermore, even today they operate as agencies or subsidiaries of foreign companies with a legal status that gives them a privileged position in the financial, foreign exchange and administrative domains. Suppression, by Chile as well as the United States, involved an income loss but never encroached upon the Companies special legal status.

The size of the mining sector's resource surplus (nitrate and copper) that went to the rich Colossus of the North and England during the last nine decades is enormous according to any standards. To call, however, the copper investment just a means of exploitation ignores the fundamental truth that the Americans turned into oases the desolate regions of the Chilean North and also the copper sector's manifold contributions described in Parts II and III of the present essay.

As already noted, government faced a "dollar and peso" revenue problem once the nitrate collapse deprived it of its major and easy revenue source. The post-depression wave of expenditure-raising, import substitution policies and concurrent rise in the government's investment program only posed additional problems. Government could raise taxes extracted from other sectors, raise indirect taxes, resort to inflation, borrow from overseas, and increase mining taxes - assuming it was unwilling to curtail expenditures. In practice it did pursue all these alternatives up to a point, but above all, it raised taxes on copper mining.

Pragmatic, political, and emotional factors turned copper mining into a natural target for excessive taxation and other discrimination. A wave of new taxes was imposed with the advent of the Popular Front headed by Pedro Aguirre and establishment of the Chilean Development Corporation in 1939.

A stumbling block in the government's efforts to establish new sources of revenue was the tax immunity of many economic sectors gained during the nitrate era. Value added in agriculture, which was less than 18 per cent of total value added in 1940, provided only a limited "taxable income"; moreover, Pedro Aguirre and his associates who were either linked with or belonged to the landed aristocracy, had little desire to re-establish agriculture as the main tax contributor. Any attempt to raise income taxes and siphon away the "surplus" of the urban service sectors would be too risky politically, require a change in tradition, and become effective too late for the country's immediate needs. The alternatives of raising indirect taxes and using inflationary credit existed and were pursued, but failed to deliver the hard currency needed for the import component of the investment program;

only dollar copper taxes could provide the guarantee needed for international borrowing.

The instruments used by government to extract resources out of copper mining included taxes, the foreign exchange rate, import duties, depreciation allowances, and administrative devices. Some or all were discriminately directed against copper mining during some or all of the period. The factors earlier mentioned do not explain the government's propensity to overtax the sector, or the use of foreign exchange rates to suppress it and extract resources that did not accrue to government. Such apparently irrational or inefficient strategies can be explained, and then only in part, by focusing attention on other, not always economic, factors. Some of these are listed below.

The high level of remittances by the copper firms during the laissez-faire period, which has been repeatedly termed imperialistic exploitation, was lamented during the post-depression period. An ever-present but never clearly formulated desire for corrective action gave rise to a quid-pro-quo formula which carefully balanced the quid of more-than-normal repatriated profits of the laissez-faire period with the quo of more-than-normal participation of Chile to copper revenues since 1940. Part of today's taxes - the discriminatory part - reflected, in the minds of the Popular Front government, the fair but not yet realized contribution of the Gran Minería to the Chilean economy. It was probably irrelevant to government that many firms which had "exploited" Chile during the laissez-faire period had, in the meantime, disappeared, that government was as responsible for the laissez-faire period's "rules of the game" as were the foreign companies, and that application of such a compensation principle was not really



compensating but was punishing Chile along with the copper firms.

Even today there exists no study giving an optimum rate of copper taxation. Thus, it should not be surprising that maximum taxation became the government's de facto policy. Such a strategy was justified by certain jargon arguments that are still as popular to many today as they were in 1940, and are simple, clear, and whenever more documented analysis is missing, extremely convincing.

Discrimination was thus advocated because the copper sector's orientation was towards the developed metropolis,<sup>1</sup> of which it is an integral component,<sup>2</sup> rather than Chile; because by withdrawing profits and quasi-rents it contributes less to the country's capital than national enterprises;<sup>3</sup> because it made possible for power groups to use revenues earned by the mining sector to import manufactured goods, which they would otherwise have been forced to produce within the country limits;<sup>4</sup> because without government discrimination there would develop a socially intolerable wage differential between copper mining and the rest of the economy; and because the United States discriminated against Chile during World War II through copper price fixing.

There is little to be gained from critically reviewing each argument. Instead, we deal with two of these points only.

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<sup>1</sup>Mario Vera Valenzuela, Política Económica, op. cit., p. 17.

<sup>2</sup>Mario Vera, Ibid., p. 18.

<sup>3</sup>Discrimination of the foreign mining rather than the foreign non-mining sector is advocated for the reason that it contributes less to national capital than the non-mining as it withdraws higher profits and quasi-rents. Mario Vera, Ibid., p. 18.

<sup>4</sup>Mario Vera, Ibid., p. 19.

It is obvious that the United States' action of fixing copper prices at 12 cents per pound during the Second World War induced Chile to impose higher taxes on the Gran Minería.<sup>1</sup> But, even though the government's action might have been justified, the other undeniable fact is that the American concerns were caught in the middle, and that Chile suffered in the long-run as a result of induced copper stagnation.

Third Period: Equitable Treatment. 1955-65.

By 1955, Chile had been over-compensated by the Gran Minería for the out-flow of resources to Great Britain and the United States during the nitrate epoch. Declining copper production since the late forties, and diminishing importance of Chile as a world copper producer, made a reassessment of the government's de facto copper "policy" imperative. Inflation, stagnation, and population explosion proved, for different reasons, that the economy could ill-afford to maintain patently irrational policies. The upshot was the New Deal Law of 1955 which introduced, first, an equitable treatment of the sector and, second, greater sophistication on the government's part in its dealings with the copper companies.

In spite of the improvements in copper legislation and better understanding of the sector's functioning, all copper projects, including the one passed in 1966, have struck me as dangerously simplistic. It is true that both Chile and the foreign enterprises, but mainly Chile, have lost vast riches from the lack of a proper copper policy.<sup>2</sup>

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<sup>1</sup> Most of the Chileans place the price-fixing issue in the forefront of the causes that have induced Chile to discriminate against the American-owned mines. It is important to mention that the copper sector has not been discriminated only by Chile but also by the United States Government through its price-fixing policies.

<sup>2</sup> In the New Copper Law every attempt is made to safeguard the investors'

Even the latest copper law appears to be the product of rush rather than intensive study and thought, and includes some provisions that all but completely strangle the policy maker's freedom. It is ignored that a copper policy is a multi-faceted one, and that any across the board provisions, besides being unnecessary, are detrimental.

The following quotation from Senator Palma's Senate speech accurately reflects the state of affairs of the copper policies and could serve as an epigraph to any study on copper:

"...Chile, which lives from copper...has never developed a policy for the sale of this metal nor has ever attempted to understand, from inside, the copper industry, but has instead maintained a position of vigilance and tax expectations and of critique of any related policies undertaken by the Companies....". Senate, p. 55.

Some major roles and distinguishing characteristics of the mining sector remained intact throughout its 1880-1967 history. Mining was and still remains the per excellence export sector; mining also was and still remains the high productivity sector that generates a massive resource surplus which is divided between the developed nations' capitalists and Chile's Central Valley population. And, ironically, the gradual substitution of natural by synthetic nitrate starting in 1917, and the eventual collapse of the nitrate industry in the decade of the thirties, does not seem to have been a bitter enough experience to provide a lesson for the future. The country still puts too many of its eggs into the copper basket, even though the copper market is steadily eroded by such substitutes as aluminium and

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<sup>2</sup> (continued from preceding page) interests without any evident attempt to protect the host state's interests. A. A. Fatouros reports that there is an international trend of this nature. See A. A. Fatouros, Government Guarantees to Foreign Investors (New York: Columbia University Press, 1962).

the "mineral" of the future: synthetics.

Change, however, has come in one respect. During the laissez-faire period, the resource surplus generated by the nitrate bonanza went either to England or national investment but did not move into the mineral of the future, namely copper. As a result, Chile, even though it had abundant "nitrate-generated" capital at its disposal, missed a unique opportunity to take control of the mining sector. The new mixed companies of Exotica and El Teniente, however, use for the first time the copper-generated resource surplus to increase Chile's commitment in its own mineral resources. As a consequence both the absolute surplus generated and Chile's share are expected to increase dramatically in the immediate future.

Traditionally, the export sector's contribution to its country's economic development has been viewed in terms of linkages.<sup>1</sup> In sections II and III of this essay I present a systematic analysis of the effects and contributions of copper mining within a generalized model of the export sector. The present model is viewed to be a general one and is thus expected to provide better insights than the existing partial ones.

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<sup>1</sup>One of the better treatments of the role of the export sector is found in Jonathan V. Levin's The Export Economies. Their Pattern of Development in Historical Perspective (Cambridge, Mass: Harvard University, 1960) Pp. 1-347. See especially Chapters I and IV, pp. 1-24 and 165-202. The Levin model, where the producing country's share in export proceeds is dissipated in luxury imports by a backward plutocracy, is alien to the Chilean case.

## PART II

### Copper Mining and Economic Development

Copper mining has been the Chilean export sector since 1935. The relation of its own performance to overall Chilean economic growth and government policy can be analyzed from a number of different angles.

Here I will distinguish three different effects which the sector can have.<sup>1</sup> They are:

A. The Resource Availability Effect, which relates to the supply of resources made available to the economy. There also exist four contributions of the sector to growth underlying this effect. These are the:

1. Foreign Exchange Contribution
2. Government Revenue Contribution
3. Capital Inflow Contribution
4. Capital Goods Contribution

B. The Profitability Effect, or, more properly, the investment profitability effect, which measures the increased demand for output, and the potential increase in investment as a result of the copper sector's growth. The contributions of the copper sector to growth underlying this effect are the:

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<sup>1</sup>The present classification of functions, or, stated differently, of effects and contributions of the mining sector has some points in common with Simon Kuznets' tripartite classification of contributions of agriculture in his essay "Economic Growth and the Contribution of Agriculture: Notes on Measurement," in Agriculture in Economic Development ed. by Carl Eicher and Lawrence Witt (New York: McGraw Hill, 1964) pp. 102-119.

1. Market Size Contribution
2. Productivity Contribution

C. The Factor Employment Effect, which refers to the direct and indirect demand for labor and capital goods generated by the mining sector. The underlying contributions are the following.

1. Labor Employment Contribution
  - a. Employment of National Labor
    - i. Unskilled.
    - ii. Skilled.
  - b. Employment of Immigrant Labor
    - i. Transient.
    - ii. Permanent.
2. Capital (Goods) Employment Contribution
  - a. Chilean
  - b. Foreign

In the following three sections an attempt is made to measure the magnitude of these three effects generated by the Chilean Gran Minería of copper and analyze their relation to growth and governmental policy. We start with the availability effect, the discussion of which will form the core of the present essay.

#### I. The Resource Availability Effect

Export mining, specifically copper export mining, makes available to the Chilean economy a volume of resources potentially convertible into consumer and capital goods. We call this phenomenon the availability

effect<sup>1</sup>

A. The Three Variants of the Resource Availability Effect

There exist three different variants of the availability effect.<sup>2</sup> The first is the gross availability effect, which reflects the total amount of resources available to the sector as a result of its activities. The effect is "gross" in two respects: it reflects the resources available to the copper sector and the economy for payments to factors of production as well as intermediate products, and, furthermore, it reflects the resources available to pay for the use of Chilean as well as foreign factors of production and intermediate products. The gross effect is measured by the total value of copper production. That is,

$$(1) A_e = P_c$$

where, A, stands for availability, P, for production, and the subscripts e and c refer to "effect" and copper respectively.

Insofar as total production is exported, production can be substituted by exports and equation (1) becomes

$$(1.1) A_e = E_c$$

where, E, stands for exports.

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<sup>1</sup>The present analysis and framework is an extension of the theoretical and empirical research that has appeared first in: Markos Mamalakis "Forced Saving in Less Developed Countries: A Rediscovery or a Misapplication of a Concept," Economia Internazionale, September 1964; and then in, Markos Mamalakis Public Policy Essays, op. cit., pp. 52-54, 76-82, and Chapter 4.

<sup>2</sup>The expression "availability effect" was chosen in order to deliberately distinguish it from the income effect. Part of the availability effect does not reflect value added in mining, and if it does, it is value added not always belonging to Chile.

Since the gross concept does not give us an idea of the net amount of resources the sector makes available to Chile, we turn to the second and more relevant net availability effect. This is measured by the total value of copper production (or exports) minus factor and intermediate product payments abroad by the sector. That is,

$$(2) A_e^n = E_c - F_c$$

where,  $n$ , stands for net and,  $F$ , for payments abroad. An estimate of  $A_e^n$  according to equation (2) is impossible due to the lack of reliable statistical information concerning payments abroad.

A second way of measuring the net availability effect is through the balance of payments effect which is defined as,

$$(2.1) P_e = (S_f + I_f) - (\pi + i + k)$$

where  $P_e$  stands for balance of payments effect,  $S$ , for sales, the subscript  $f$  for foreign,  $I$ , for investment, and,  $\pi$ ,  $i$ , and  $k$  for profit, interest and capital payments abroad respectively. The magnitude of this effect has been calculated for the 1952-1964 period with a summary presented at the end of the essay. The Index of this effect shows a constant improvement since 1953 when its value was 41.96 as compared to 100 for 1961. This improvement, however, has only been a minor one since 1960.<sup>1</sup>

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<sup>1</sup>The index of the balance of payments effect can easily lead to erroneous conclusions for a number of reasons. First,  $\pi$ ,  $i$ , and  $k$  reflect only part of payments overseas. If other payments overseas are significant, the net foreign exchange contributed by the copper sector to the economies may be substantially smaller from the one measured by the balance of payments effect. The index is likely to be affected if these payments behave differently than the items reflected in it. Second, deducting all payments abroad from the value of sales is impossible because of insufficient statistical information. Third, payments abroad include purchases of investment goods, which are included in the first part of the equation; it would thus be absurd to deduct those expenditures. For more detailed statistical evidence see appendix table on the Balance of Payments Effect.



Because of the statistical and conceptual difficulties that beset versions (2) and (2.1), the net availability effect was redefined in an operational way as the sum of expenditures of the copper sector in Chile. That is,

$$(2.2) \quad A_e^n = L_c + T_c + I_c + M_c = R_c$$

where,  $L$ , stands for legal cost of production, mainly wages and salaries,  $T$ , stands for direct taxes,  $I$ , for investment,  $M$ , for miscellaneous local expenditures, and,  $R$ , for returned revenue.<sup>1</sup>

Finally, we propose a third variant, to be called the net overall resource availability effect, which differs from the gross and net effects in that it takes also into account the amount of resources the copper sector makes available to the Chilean economy indirectly by establishing or contributing to a "business climate" favorable to the inflow of foreign capital. This effect is measured by the sum of local expenditures (returned revenue) of the copper sector plus the capital inflows induced by the sector. That is,

$$(3) \quad A_e^o = R_c + C$$

where,  $o$ , stands for net overall and,  $C$ , for induced capital inflows.

1. The statistical evidence on the availability effect. The magnitude of the gross availability effect, which is measured by the total value of copper production, is presented in Table 1. In order to eliminate the impact of price movements, the current prices figures were deflated by the U.S. wholesale price index and series in 1961 constant prices were obtained.

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<sup>1</sup>The "domestic effect" measure proposed by the University of Oregon group is almost identical with the measure proposed here. The difference between the two lies in that equation (2.2) includes miscellaneous local expenditures which the Oregon measure excludes, and does not include domestic sales, which the Oregon formula does include.

Table 1

Gross Availability Effect of Large-Scale Copper Mining  
As Measured by the Value of Production.

		Value of Production (Millions of U.S.\$)	
		Current Prices	1961 Constant Prices
First Period: 1930-39	Total	492.9	1140.7
	Average	49.3	114.1
Second Period: 1940-54	Total	2138.2	3004.5
	Average	145.9	220.3
Third Period: 1955-64	Total	3095.6	3134.9
	Average	309.6	313.5

Source: Appendix Tables A and B.

There is a definite upward trend underlying this effect. During the First Period, when the sector was suffering from depression-induced low prices and output, the value of production, in 1961 constant prices, was a respectable \$114 million a year. During the Second Period, when the sector was suppressed, average exports - or production - reached new highs. These averages obviously conceal large variations within the period considered. The symptoms of stagnation and results of discrimination are found in the decline of production value after 1948 and up to 1953,<sup>1</sup> and the substantial decline in quantity produced after 1944 and until 1954. What really shocked Chileans into recognizing mining stagnation, and the need for constructive

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<sup>1</sup>The value of copper production reached \$215.5 million in 1948, and had fallen to \$113.9 million in 1953, before it recovered to \$220.8 million in 1954. The gross availability effect is determined by the level of production; if production and exports are identical, the latter could also be taken as a measure of the availability effect.

policies, was the declining importance of Chile as a copper producer in the world market. The Chilean share in world copper output, the then Senator and now President Eduardo Frei pointed out in 1952, had been reduced from an all-time high participation of 44 per cent between 1860 and 1870 to a meager 13 per cent in 1952.<sup>1</sup> Chile could hardly afford the revenue losses arising from such an adverse situation, and manifold corrective policies have been both suggested and implemented ever since.

With the onset of the Third Period in 1955, the gross availability effect started rising and real value of production soared to a yearly average of \$313.5 million; quantity produced also reached all time highs in 1959.<sup>2</sup>

B. The Four Contributions Underlying the Availability Effect

As already mentioned, government never really had a de jure copper policy, and its de facto policies can only be traced through the net impact of numerous, often conflicting, government actions. Even in its short-term actions, government never really thought in terms of or directly worried about the availability effect. Instead, it was interested in what the sector could contribute in such specific terms as taxes and foreign exchange. Since

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<sup>1</sup> See "Repuesta del Senado a la Consulta Respecto al Cobre", Panorama Económico Num. 92, December 18, 1953, pp. 854-859; and Boletín Num. 21.773, Senado, Informe de las Comisiones de Hacienda y Minería, Unidas, op. cit., pp. 4-6.

<sup>2</sup> Still, the physical output increase cannot be termed as spectacular under any criterion. In 1960 it was barely higher than in 1944, and the output of 1162.8 million pounds in 1964 (the highest up to that year) was not even 15 per cent higher than that in 1944; and all this twenty years after the output peak of the forties and ten years since the celebrated New Deal. See Historical Statistics of Chile 1840-1965, op. cit.

its strategy, and thus policies, aimed at these specific contributions, it appears efficient to analyze these contributions directly and deduce evidence indirectly from them about the availability effect. The explicitly considered contributions by government have been the foreign exchange (gross and net) and the government revenue ones; in addition, in this essay we will consider the capital inflow and capital goods contributions which, even if they have not always guided the governments thinking, behavior and motivation, should do so in the future because of their direct impact on economic growth. May we point out at this moment that government has been increasingly pre-occupied with obtaining maximum foreign exchange and government revenue contributions, but has either ignored or curtailed the two other ones.

1. The gross foreign exchange contribution. The foreign exchange contribution has two variants, a gross and a net, corresponding to the gross and net availability effect. The gross concepts are related, as already mentioned, to the value of total copper exports.<sup>1</sup>

Government has, in recent years, proceeded to maximize this contribution by formulating and pursuing efficient (a) production, (b) commercialization, and (c) manufacturing policies. Quantity, price, and domestic value added have been the respective targets.

The emphasis on an adequate production policy started once Chileans realized that their world share and physical output were declining. Before 1940, government just paid "no attention" in its belief that "le monde va de lui même." Once the nitrate collapse shocked government out of this "no attention phase", Chile shifted to only a slightly more efficient

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<sup>1</sup> The difference between the availability effect and the foreign exchange contribution is determined by the difference between production and exports. As long as production is partially channelled into domestic activities the size of the gross availability effect would be larger than the gross foreign exchange contribution.

policy of obtaining a maximum resource release for any given output level; the de facto policy, which was established through inertia on some fronts and action on others, and can be best described by the "get-what-you-can-now" motto, lasted until 1955. Only then did government attempt to obtain a larger gross foreign exchange contribution through a production policy having "exports" as its maximand. An export-oriented production policy also provided the cornerstone for the 1966 copper agreements.

No major stumbling blocks are found on the path towards an overall production policy agreement between government and Companies. The Chilean government has also made clear that it's main objective in 1965, for the future, is a copper output increase, without forgoing any market dictated price rises. In this respect, there exists little conflict between the production plans of government and Companies.

In spite of the good will of the parties involved, it should be mentioned here that the latest (1966) Copper Agreements hardly establish a production policy providing a "living arrangement" between Chile and the Companies. As was the case for all previous arrangements, incentives are provided for a once-and-for-all investment and output increase rather than their continuous rising flow over time. Output is expected to rise up to 1970 and maintain a stationary value up to 1985.<sup>1</sup>

The price variable, which in raw-materials producing countries such as Chile is almost always the center of controversy, has been an integral

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<sup>1</sup> See R. Saez, op. cit., Table III, p. 7. The level of technical competence that has gone into planning and preparing these projects from the Chilean side has been low. They thus promise to be another fiasco in Chilean economic development. See also the projected output figures.

component of the "commercialization" policy. A commercialization policy is definable as the complex of the steps and strategies adopted to raise the price of a given quality of copper exports. These moves have included bilateral price-fixing during World War II, take-over of all copper sales by the Central Bank (early fifties), and cartel-like price rises by Chile and Zambia during 1966.

The most strongly advocated measure to raise copper export prices has been a Chile-enforced equalization between the New York and London Metal Exchange (CLME) prices. This objective was first partially fulfilled in 1966, for Chile's exports at least, when the Departamento de Cobre raised the per pound price from 42 to 62 cents. A more subtle way of enlarging the share passing through the London market-always assuming the London market, such a strategy is feasible primarily during periods of general copper shortage.

Even if not always explicitly stated, a major aim of the commercialization policy has been to make the copper sector independent of the United States, a course strongly advocated by Senator Frei.<sup>1</sup> Furthermore, because the Gran Minería never sold to Eastern Europe, an alternative repeatedly endorsed by numerous politicians,<sup>2</sup> Chilean policy makers believed that

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<sup>1</sup> See "Respuesta del Senado a la Consulta Respecto al Cobre", Panorama Económico, No. 92, December 18, 1953, p. 858.

<sup>2</sup> A fervent advocate of a national copper policy and unrestricted trade contracts has been Radomiro Tomic, whose views are summarized in the manifesto-like speech "The Copper is Chilean" made in the Chilean Senate on July 13, 1961. See Republica de Chile, Diario de Sesiones del Senado, Publicacion Oficial Legislatura Ordinaria, Sesion 20<sup>a</sup>, en martes 18 de Julio de 1961. Apartado "El Cobre'es Chileno" Pp. 3-20. According to this speech, for the Christian Democrats, the Chilean Copper Policy must incorporate the following fundamental strategies: I. The whole globe as market for Chilean copper. II. Chilenization of International Trade of such copper. III. Complete

compensation was due, either by the Companies or the United States Government for the income loss incurred. The most extreme and profitable move in manipulating copper prices came with Law 10255 of February 1952, which charged the Central Bank with the purchase and sale of the metal and netted the government an unprecedented amount of revenues.<sup>1</sup> The persistent demand for Chilean commercialization of all copper exports, which is extensively satisfied in the Copper Association Agreements, is based on the desire to obtain a maximum gross foreign exchange contribution by diversifying exports in a way which would reduce the American influence on price determination.

Chilean attempts to raise prices without a change in the product mix have brought into the open the underlying conflict between the United States and Chile, two sovereign states. The United States Government, being a buyer, has resented price increases in copper because this is a strategic material and the increases tend to show up during tension periods, such as the Korean or the Vietnamese Wars, when the American government is oversensitive to price rises. Chile complains, nevertheless, that the United States Government is asymmetrically sensitive to price changes; on one side it flatly objects to increases and goes as far as to impose price ceilings<sup>2</sup> but on

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<sup>2</sup> (continued from preceding page) refining of copper in Chile. IV. Elaboration of a reasonable percentage of copper that is being exported. V. Chilenization of large scale copper mining. See R. Tomic, Ibid, p. 7. As of 1967 only the second strategy had come completely under Chilean initiative. From the rest, only objective or strategy No. V has been partially pursued and implemented.

<sup>1</sup> The output of the small and medium-scale mining has been almost always sold at the higher price in Europe.

<sup>2</sup> The three most frequently cited instances of price fixing by the U.S. Government are the following. Prices were "unilaterally" fixed at 12 cents per pound (purchase monopoly by U.S. Commercial Co.) during World War Two; prices were fixed at 24.5 cents in 1950 through an agreement between the companies and the United States government; and then a surprice (sobre-precio) of 3 cents per

the other side, leaves unfavorable to Chile price declines to be determined by an imperfect international price mechanism. The final outcome of this situation, it is argued, involves permanent gains to the Colossus of the North and permanent losses to poverty-stricken Chile. Why should Chile, which produces copper needed to win wars, suffer during War Periods, when Peru and Argentina which produce agricultural products secondary to the war effort, reap massive wind fall gains.<sup>1</sup>

A concurrent conflict exists between Companies and Chilean government with respect to price policy. Since there exist two (if not more) copper prices, one domestic in the United States which is artificially low due to subsidies, arm-twisting by the government, and releases from government stock piles, and another international, which is presumably market-dictated and high; and since the Gran Minería supplies mainly the North American market, the Companies face a dilemma. A price increase is likely to invoke the wrath of the American Community, Government, and even the President; foregoing a market-dictated price increase, on the other hand, will incur the wrath of the Chileans raising legitimate claims of exploitation, if not also of the Chilean Government and the President. The private companies, which have two allegiances, one to their home government, and another to the country where they operate, are expected to satisfy two conflicting objectives. The conflict is essentially between two sovereign states, but the lack of international law for solving it makes it appear as a "foreign firm-government" conflict.

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<sup>2</sup> (continued from preceding page) pound of Chilean copper sold in the United States was established on May 7, 1951, through the Washington agreement. See Mario Vera, Política Económica, op. cit., p. 39.

<sup>1</sup> It is ironic that the United States should have compromised its relationship mainly with those developing countries which produce "war materials".



The solution from the economist's point of view would be to permit sale of U. S. produced copper at the government controlled price; sale of Chilean produced copper at international market prices, and a United States Government subsidy on imported copper equal to the international-domestic price differential to permit domestic users to pay for imported copper domestic rather than international prices.

Finally, the gross foreign exchange contribution of the copper sector rises as the domestic value added increases through processing. Two major alternatives exist here. First of all, the value of exports can be increased by improving the quality of exports. In the case of copper, this means a change in the product mix exported, with electrolytic copper, which receives a higher price,<sup>1</sup> rising more rapidly than the lower quality blister,<sup>2</sup> or, fire refined copper. The Chilean government has a strong preference towards the production of electrolytic copper and has voiced its concern through the Central Bank over the decline in its relative importance.<sup>3</sup> Production of blister involves a direct loss to the gross foreign exchange, government revenue, and employment contributions since it leads to lower income for the

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<sup>1</sup> Raul Saez, one of Chile's foremost copper experts, expresses the government views when he anticipates an increase in the value of exports as a result of a rise in average price. See R. Saez, op. cit., p. 8.

<sup>2</sup> For an analysis of this price difference due to quality variation, see Mario Vera, Política Económica, op. cit., pp. 32-33. In 1960, fire-refined copper was receiving 0.5 cents less than electrolytic in the North American market, and 0.375 cents less per pound in the L.M.E. market; a premium of 1.5 cents per pound was paid during the same year for electrolytic copper. See Mario Vera, Ibid., p. 33.

<sup>3</sup> From 45.2 per cent of total production in 1950 the relative importance of electrolytic copper declined to 31.6 per cent in 1961. See Mario Vera, op. cit., p. 197. See also Ibid., p. 34.

subsidiary operating in Chile and lack of local refineries. The American companies have preferred production of blister because it involves a smaller foreign investment per final ton produced.<sup>1</sup> centralization of refining operations in the United States, smaller taxation, and control of the destiny of the final output.<sup>2</sup> It is likely that, in view of the foreign firms' multi-plant and multi-country operations, the optimum export mix for them leads to a less than optimum mix from Chile's point of view. It is worth pointing out that a deterioration in the quality mix is evident not only during the latter part of the Second Period, but that it continued during the Third Period when discrimination had been reduced.<sup>3</sup>

A definite conflict exists as regards the product mix policies. The Chilean government is interested in producing the type of copper leading to the best quality and highest price, and consequently provides the highest foreign exchange contribution. The American Companies want to produce in Chile what is optimum in view of their multi-country and multi-plant operations. In this strictly private firm-host government conflict a solution is apparently reached that provides for a maximum output policy by the firms in return for relative freedom in selecting the product mix. Government is thus compensated for the quality loss by a product gain. Since private firms have a power to retaliate in the government-company game, a solution close to joint maximization is reached.

The second alternative goes beyond the simple change in the product mix and involves local manufacturing and subsequent export of processed copper

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<sup>1</sup> Mario Vera, Ibid., p. 34.

<sup>2</sup> Mario Vera, Ibid., p. 34-35.

<sup>3</sup> See Historical Statistics of Chile, 1840-1965 op. cit. Table titled "Production of Copper by type".

products. In the Senate discussions this is cited as a hopeful method of increasing the foreign exchange contribution.<sup>1</sup>

2. The net foreign exchange contribution and the two expenditure flows. Whatever Chile's apparent interest in the copper sector's gross foreign exchange contribution might be, its real interest does, or should, lie with the net availability effect and net foreign exchange contribution.

Perhaps the most important distinguishing characteristic of the Chilean copper sector is the difference between its gross and net foreign exchange contributions. This difference arises from its foreign ownership and its freedom to deal internationally without the limitations and restrictions imposed on Chilean firms. Stated more clearly foreign-owned copper mining has two expenditure and income flows: national and foreign expenditures, and Chilean and United States income flows. The expenditure flows include, in addition to factor payments, expenditures on intermediate products, transportation, insurance and so forth.

The net foreign exchange contribution has three components: payments to Chilean factors of production employed in mining, payments for local intermediate products and services, and investment expenditures. The two latter groups will subsequently form one group called "other expenditures".

Chilean economists and politicians alike have, for more than half a century, used the term "retornos" to describe the part of export revenues returned to the economy. The Economic Commission for Latin America proceeded to calculate both the simple and "returned revenue" terms of trade,<sup>2</sup>

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<sup>1</sup> Boletín Num. 21.773, Senado, op. cit., p. 2, and Annex, p. 10. See also Radomiro Tomic, "El Cobre es Chileno", op. cit., p. 7.

<sup>2</sup> See Antecedentes sobre el desarrollo de la Economía Chilena (Santiago, Chile: Editorial del Pacífico).

the latter one taking into account the changing share of copper revenues accruing to Chile. According to this study, the simple terms of trade changed - with 1937 as a base year - from 102.2 in 1928 to 53.3 in 1944, to 101.4 in 1952. In contrast, the "returned revenue" terms of trade rose from 95.0 in 1928 to 102.3 in 1944, to a spectacular 252.0 in 1952. Anibal Pinto also discusses the "foreign-national revenue" issue in terms of nominal relative prices between exports and imports, which do not consider the inter-country distribution of factor and other payments, and real relative prices, which reflect the changing participation of the country in the nominal value of copper.<sup>1</sup> The ECLA findings have been confirmed by the most recent and systematic disaggregative study of the copper sector's "returned revenue" problem by Clark Reynolds. Reynolds, who has translated the term "retornos" as "returned value", also concludes that the deterioration of the barter terms of trade was more than offset, up to 1954, by the improvement in the "returned value" terms of trade.<sup>2</sup>

The analysis of the net foreign exchange contribution is complementary

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<sup>1</sup>See Anibal Pinto Santa Cruz, Chile, Un Caso de Desarrollo Frustrado, (Santiago, Chile: Editorial Universitaria, S.A., 1962), p. 118.

<sup>2</sup>See C. Reynolds, Copper, Essays, pp. 201-350. As the reader may have noticed I have here translated the term "retornos" by "returned revenue" rather than the Reynolds term "returned value". The reasons are the following. The "returns" to Chile include copper value added by Chilean factors of production as well as other local expenditures by the sector. Furthermore, some local intermediate product expenditures have an import component, which would have to be deducted from the "returns" to determine the true overall "returned value", an element which is difficult to determine. The use of the term "revenue", instead of that of "value", avoids the otherwise unfounded impression that the "returned value" refers directly to copper factor payments and that the indirect foreign expenditure component has been deducted for all steps of sectoral value added. Finally, from the efficiency point of view, it makes a difference whether "returned revenue" rises through higher factor payments in mining or higher local intermediate product expenditures and therefore two subconcepts should be devised.

to the over-analyzed problem of terms of trade. I believe that it shifts the emphasis back where it belongs, that is to the absolute, rather than relative, gains of Chile from the copper sector's growth. As regards the copper sector in Chile, the terms of trade issue is intimately connected to the distribution of copper resources between Chile and the rest of the world. It tends to neglect the growth issue which coincides with the distribution issue only within a range.

The notion of the net foreign exchange contribution goes beyond the "returned revenue" terms of trade issues. It takes into account the relative price movement between exports and imports; it focuses attention on both the changing ratio between national and foreign factor payments and the changing ratio between national and foreign intermediate product expenditures - that is, the intercountry resource distribution problem, and finally makes growth the main issue by pointing out that the absolute amount of resources released by the copper sector of Chile can be inversely related - over the long run - to the relative (share) amount of resources released.

As already mentioned, the gross differs from the net foreign exchange contribution because of the foreign and national components of the sector's expenditures. We now proceed to analyze this point more carefully since it creates most frictions between Government and Companies.

Copper expenditures have two components; income payments and other. The category "other" includes all "intermediate" expenditures and, sometimes, investment. Both types of expenditures have "foreign" and Chilean components. Symbolically, these components are shown in the following identity:

$$(4.0) \quad E_c = Y_c + O_c = (Y_{cn} + O_{cn}) + (Y_{cf} + O_{cf})$$

where, E, stands for expenditure, Y, for factor payments, O, for other payments, and the subscripts c, n, and, f, for copper, national and foreign respectively.

In the statistical appendix we have calculated two versions of the net foreign exchange contribution. The first version,<sup>1</sup> to be referred to as Type A, is equal to the sum of taxes paid in Chile (T), the legal cost of production (L), and miscellaneous local payments (O). That is, the net foreign exchange contribution is equal to:

$$(4.1) \quad Y_{cn} + O_{cn} = T + L + O$$

where  $Y_{cn} = T + L$ , and  $O_{cn} = O$ .

The second version, to be referred to as Type B, includes in addition, the value of investment (I). In this version  $O_{cn} = O + I$ .

The items normally excluded from the "returned revenue" and "net foreign exchange contribution" concepts are repatriated profits (including interest payments) ( $\Pi$ ), deduced amortization (depreciation) (A), and

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<sup>1</sup> Both my notion of a net foreign exchange contribution as well as the Chilean one of retornos (returned revenue or value) have been subject to erroneous statistical measurement. The item creating difficulties is "other foreign expenditures". From the conceptual viewpoint these consist of revenues returned to Chile and subsequently spent for imports. The special status of large scale copper mining eliminates the steps involving a sale of foreign exchange to the Central Bank and subsequent repurchase for necessary imports. But this technicality does not justify the Central Bank's procedure of excluding such foreign expenditures from the "retornos"; neither does it make Reynolds' calculation of "returned value" or mine of the "net foreign exchange contribution" theoretically invulnerable. Although the net foreign exchange contribution has been calculated here in a version that excludes "foreign expenditures" of the copper sector, these foreign expenditures are incorporated into the balance of payments statistics and analysis elsewhere in the author's monograph on the Chilean economy.

expenditures outside Chile (X). In other words, the "unreturned revenue" is equal to:

$$(4.2) \quad Y_{cf} + O_{cf} = \overline{U} + A + X.$$

As already pointed out, there exists no a priori theoretical justification for not including the item "expenditures outside Chile as part of the retornos".<sup>1</sup>

Before we proceed with the discussion of the major theoretical issues surrounding the net foreign exchange contribution we pause for a moment to present a summary of the relevant statistical information.

Table 2

Net Foreign Exchange Contribution of Large-Scale Copper Mining (in Millions of U.S. \$)

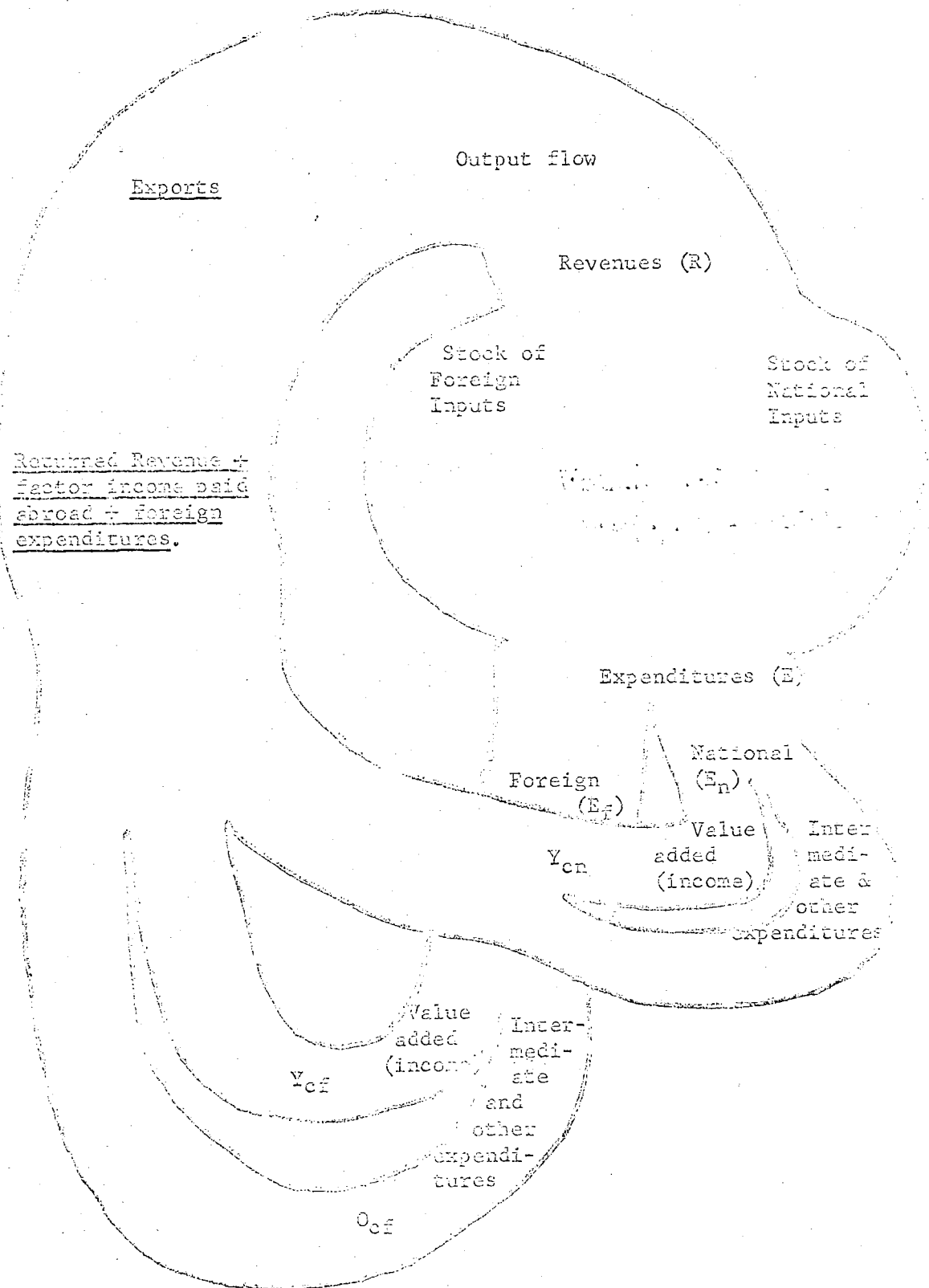
		<u>Type A</u>		<u>Type B</u>	
		(Excluding Value of Investment)		(Including Value of Investment)	
		<u>Current Prices</u>	<u>1961 Constant Prices</u>	<u>Current Prices</u>	<u>1961 Constant Prices</u>
First Period:	1930-39				
	Total	172.5	401.3	184.4	428.0
	Average	17.3	40.1	18.4	42.8
Second Period:	1940-54				
	Total	1399.3	1838.0	1560.2	2027.6
	Average	93.3	122.5	104.0	135.2
Third Period:	1955-64				
	Total	1873.0	1899.3	2113.7	2142.4
	Average	187.3	189.9	211.4	214.2

Source: Appendix Tables A and B.

<sup>1</sup> See the discussion in the preceeding footnote.

Flow Diagram

Large-Scale Copper Mining





The foreign exchange contribution has been calculated with and without the value of investment, and in current and constant prices.

The net foreign exchange contribution shows a marked rise between the First and Second Periods as well as between the Second and Third. The size of the contribution is higher by around ten per cent for the last two Periods and by around five per cent during the First Period if investment is included. To a large extent, this rise reflects improvements in relative copper prices rather than increases in physical output.

The next step is to introduce some major issues related to the net foreign exchange contribution along with the statistical evidence available with respect to its various components. Although we will thus discuss the importance and behavior of the "legal cost of production" and miscellaneous local expenditures, the discussion of taxes will be postponed until the next section.

Chile's social welfare function would suggest an explicit interest in maximizing the bracket  $(Y_{cn} + O_{cn})$ . The alternatives open to a policy maker interested in maximizing the net foreign exchange contribution depend on the time horizon considered. Obviously, in the short-run the most efficient strategy for maximizing  $Y_{cn} + O_{cn}$  is to adopt measures increasing its share in total revenue; over a slightly longer run, when changes in output are feasible, maximization of  $Y_{cn} + O_{cn}$  would be a by-product of maximizing total copper revenues. The conflict between short-term and long-term objectives stems from the undisputed fact that a short-run maximum of  $Y_{cn} + O_{cn}/E_c$  can cause a less than optimum long-run value of  $Y_{cn} + O_{cn}$ . There must exist, nevertheless, a value - or a range of values - for  $(Y_{cf}/E_c)$  that gives a maximum long-run value of  $Y_{cn} + O_{cn}$ .

The aforementioned problem arises because a sectoral expansion cannot be achieved unless minimum profit incentives are offered, and, in addition, unless foreign companies are permitted to repatriate an adequate dollar return on their invested capital. For the Gran Minería, the issue has been always related to repatriation of an adequate amount of dollar profits to the United States.

The "denationalization" of the copper industry, which followed the industry's takeover by the Guggenheim and later Kennecott and Anaconda interests, has been the factor that led to the conflict between the private foreign interests and the Chilean interests; Machiavello Varas, who lamented this denationalization in the early twenties, was among the first to express the desire to "nationalize" the sector, that is return copper ownership to Chileans.<sup>1</sup> Varas' concept of nationalization coincides with the Christian-Democratic concept of Chilenization but differs radically from the leftist concept of "nationalization", that is confiscation and expropriation of the foreign-owned operations.

The Chilean government's strategies, if the assortment of conflicting actions and inertia can be called a strategy, have increasingly aimed towards raising the copper sector's net foreign exchange contribution.

During the First Period, the net foreign exchange contribution (Type B) only twice - in 1930 and 1931 - exceeded fifty per cent of production value; during two years it amounted to less than twenty-five per cent of the value of production, with the remaining seventy-five per cent flowing into foreign factor and other payments. The statistical information for this period is

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<sup>1</sup> Santiago Macchiavello Varas, op. cit., pp. 1-200

incomplete in that it does not permit an accurate distinction among the foreign expenditure flows. Some events are, nevertheless, clearly discernible and worth noting. Even in 1939 the absolute magnitude of the net foreign exchange contribution only slightly exceeded the 1930 magnitude; investment did not recover its 1930 level even in 1939 - causing the Type B contribution to recover less rapidly than Type A; production and "returned revenue" underwent a cycle, which has 1932 as its trough, and subsequently rose mildly but without a concurrent investment boom; with the exception of 1932 and 1933, the American companies enjoyed a positive flow of profits, which, for the 1935-39 period (\$269.9 million in 1961 prices), exceeded by around ten per cent the corresponding flow of "returned revenue" (\$249.7 million in constant prices); finally, during most of the years, the "legal cost of production" contributed as much as ninety per cent of the "returned revenue". The copper sector maintained its privileged status as a foreign enclave during this period of severe crisis of the Chilean economy.

The Second Period provides a fascinating contrast to the First: the net foreign exchange contribution rises steadily (both Type A and B), both in absolute and relative terms; only twice does it, for either type, fall below fifty per cent of production value and in 1953 surpasses it by an incredibly high percentage - thirty per cent for Type A and fifty per cent for Type B. In other words government policy succeeds in raising the copper sector's net foreign exchange contribution above the gross one by almost fifty per cent.<sup>1</sup> While during the First Period the difference between the gross and net foreign exchange contribution tended to be enormous and

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<sup>1</sup>See Columns 9 and 10 from Table F,

relatively stable, during the Second this difference not only steadily shrinks towards zero but even becomes negative for the years already mentioned. Chile's policy seems to consist in bringing the "returned revenue" as close as possible to the value of production and is so successful that it practically kills the goose that lays the golden eggs: quantity produced declines between 1944 and 1954,<sup>1</sup> and the gross availability effect and gross foreign exchange contribution are completely stagnant.<sup>2</sup>

May we further note the following developments underlying the net foreign exchange contribution during the Second Period. The relative importance of the "legal cost of production" rises and stabilizes at a level of approximately forty per cent of the value of production. Since this item accounts for such a high share of the net foreign exchange contribution it deserves a more careful examination.

Table 3

<u>Legal Cost of Production</u> (In millions of U.S. \$)			
		<u>Current Prices</u>	<u>Constant Prices</u>
First			
Period:	1930-39		
	Total	136.9	319.8
	Average	13.7	32.0
Second			
Period:	1940-54		
	Total	796.9	1068.3
	Average	53.1	71.2
Third			
Period:	1955-64		
	Total	361.3	867.2
	Average	86.1	86.7

Source: Appendix Tables A and B.

<sup>1</sup>See Historical Statistics of Chile, 1840-1965, op. cit., Table titled "Production of Gran Minería".

<sup>2</sup>This is true if the value of production is measured in 1961 constant prices.

This item has two major components: purchases of intermediate goods and services within the country and remuneration of wage and salary earners.<sup>1</sup>

As the figures of Table 3 illustrate, the per annum dollar value of the legal cost of production more than doubles during the period of discrimination (1940-54) as compared with the decade of the 1930's. The rigidity in the foreign exchange rate and the accelerating internal inflation are perhaps the most important factors contributing to this rise. The national accounts information available to us<sup>2</sup> indicates that, for 1950-60, the expenditures on intermediate goods and services, which account for an average of 15.9 per cent of production value, have been the most important component<sup>3</sup> of the legal cost of production; wages and salaries account,

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<sup>2</sup>(continued from preceeding page) The value of production (Table B, Column 1) rose from \$198.3 million in 1940 to a maximum of \$246.0 million in 1943 and declined for the rest of the period. The gross availability effect has an average value of \$200.3 million with no underlying upward trend. (See Table B, Column 1, bottom).

<sup>1</sup>In Chile a very sharp distinction is made among blue and white-collar workers, the former ones being called obrereros and the latter ones empleados. The empleados have succeeded, through social and similar legislation, to occupy a privileged position in terms of unemployment, pension, health, family allowance and similar benefits.

<sup>2</sup>See Appendix Tables E and F. Even though the national accounts information presented in the Appendix rarely coincides with the primary information presented in Tables A and B (the differences, which are high during 1950-55; are reduced markedly during 1956-60), quite frequently because of differences in methodology, there exists no reason to question the validity of the relative importance of the components of the production account of the foreign copper enterprises.

<sup>3</sup>The CORFO estimate of the legal cost of production persistently falls short of the figure given by the American Companies, the Central Bank and the Departamento de Cobre - sometimes, as in 1953, by one hundred per cent. This case provides a vivid example of the difficulties encountered in estimating national income in an economy that undergoes rapid inflation, where there exists a system of multiple exchange rates, where statistical information is not made immediately available, and the use of different dollar-peso conversion rates can give rise to strong differences in the estimates of the components of value added and intermediate expenditures. My guess is that the lack of uniformity in conversion rates is the main factor causing the discrepancies mentioned earlier.

during the same period, for as little as 10.7 per cent of the value of production; and social security contributions amount to around 2 per cent. Since an underestimate of the wage bill in the national accounts is very likely, we can reasonably assume that fifty per cent of the legal cost of production is value added in mining and the rest intermediate expenditures. Between 1950-60, around 25-30 per cent of the "returned revenue" was utilized to cover such intermediate expenditures.

Concerning the Second Period we can make the following concluding remarks. The copper sector was suppressed according to two criteria: as a consequence of the overvaluation of the peso the value of production, "returned revenue", and national value added in mining, as expressed in escudos, have been underestimated by a margin rising from 22 per cent, in 1940, to 200 per cent, in 1948, to 492 per cent in 1952;<sup>1</sup> furthermore, it has been suppressed in the sense that overt and hidden taxation have forced it to release to Chile a percentage value of resources exceeding any normal yardstick. The statistics provide eloquent support. Returned revenue rose in 1953 to an all-time, and never forgotten, high of 147 per cent of production value; repatriated profits<sup>2</sup> declined from \$68.8 million in 1940, to \$44.8 million in 1944, and to as low as \$10.5 million in 1953; surprisingly, as a result of the Chilex Sulphuric plant installed in Chuquicamata, investment experienced a sudden spurt at the peak of dis-

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<sup>1</sup>See the last column of Appendix Table M.

<sup>2</sup>See Column 3 of Table B. Still, it should be noted, that profits remain highly respectable between 1940 and 1948, and average twenty per cent of production value for the period as a whole (\$41.9 million of yearly profits out of \$200.3 million yearly sales).

crimination between 1949 and 1953.<sup>1</sup> Finally, government, in addition to artificially reducing the sector's contribution to the country's income by overvaluing the exchange rate, neglected to establish an investment policy. The government's major aim apparently was discrimination of the foreign capitalists, and reduction of their share in value added; although this objective was pursued with a relative success, if the share of foreign income in total value added is used as a criterion, foreign capitalists seem to have escaped with relative few scars, if the return on invested capital is used as a criterion. It was the copper sector that became ultimately the major victim.

Thus, in its treatment of the copper sector during the first two Periods government shifted from one extreme policy, i.e. complete freedom, to another, i.e. every possible discrimination short of confiscation. During the Third Period, government veered toward a compromise middle-of-the-road policy. Tax rates were reduced, the foreign exchange rate, which between 1940 and 1952 was fixed at 12 pesos for one dollar, followed more closely internal price movements, and depreciation allowances became more liberal.

As a result of the New Deal policies the Type A net foreign exchange contribution rose to \$189.9 million per annum, and Type B to \$214.2 million. During the Third Period some striking differences arise as compared to the Second Period. The contribution, though, on the average higher, is stagnant, while during the Second Period it had been rising. Three interpretations

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<sup>1</sup>For a detailed, but not altogether objective, discussion of copper investment during 1950-60, see Mario Vera Valenzuela, La Política Económica del Cobre, op. cit., pp. 129-138.

can be given for this stagnation. One, that, for the contribution to be maintained at the high levels of the Second Period, Chile had to, as it did, give an increasing share of gross revenue to the foreign capitalists; had it not done so both gross and net contributions would have declined. The other, that, the American entrepreneurs had to be given a ten-year "breathing spell" to recover and subsequently boost both the gross and net contribution. And a third, the leftist, by Mario Vera, that stagnation of the net foreign exchange contribution was predictable because there exists no response of the Companies to better treatment other than a higher level of profit repatriation.

If the government's policy during the Third Period was one of indirectly augmenting the net, through a profit-induced increase in the gross foreign exchange contribution, it has admittedly not been very successful. Chile did release an increasing share of the copper resources for "foreign uses" but in a new pattern. Yearly repatriated profits (average) rose to \$47.3 million as compared to \$41.3 during the Second Period; but, most important, now they were sizable and stable, while previously they had been declining over time, dwindling to almost zero in 1953. Moreover, legal provisions for accelerated depreciation, and the investor's desire for immediate capital recovery, boosted the average annual amortization levels from \$7.9 million during the Second to \$17.3 million during the Third Period. Expenditures outside Chile, unexpectedly, more than quadrupled in comparison to the previous Period. In return for all this comparatively favorable treatment the exhausted Potrerillos mine is replaced by the El Salvador, but little further new investment comes forth.

The overall picture that emerges is one where the net foreign exchange



contribution is strongly affected by the changing pattern of the three external flows, that is amortization, repatriated profits, and expenses abroad. The Companies appear willing, since 1955, to accept "normal" profits in exchange for "high" depreciation allowances, and also accept, for their operational expenditures, a rather rigid "buy national policy" in return for more favorable foreign exchange rates.

We proceed next to the government revenue contribution of the copper sector.

3. The government revenue contribution. It is the tax contribution of the copper sector that has attracted the Chilean Government's most explicit and persistent attention. Government recognized that the Gran Minería possessed, as a result of its high productivity, a "surplus" that could be appropriated for either current or capital expenditures; however, most of this vast resource surplus was transferred, up to the early 1940's, to the American owner-capitalists. In attempt to change this pattern detrimental to Chile, the Government embarked into a policy of gradually diverting this "resource flow abroad" from the United States towards Chile. This policy coincided with the establishment of the Chilean Development Corporation, inauguration of a direct public investment policy in all sectors, and was definitely stimulated by the persistent balance of payments crisis. The major instruments used in pursuing this goal were the foreign exchange rate and direct taxation.

Analyzed in the present section is only that part of the process of "resource release" out of mining which is related to government revenues. The discussion of the "resource allocation process" and the use of resources appropriated by government is found in the last section of the essay.

The Government-Company game centered around "mining surplus" and it involved its partition between the Chilean Government, on one side, and the American Companies and Government on the other. The Government's interest has been eloquently pointed out in the 1965 Senate hearings:<sup>1</sup>

"The resources which the State receives as a result of copper sales amount only to 14.8% of the total incomes with which the State counts to cover its expenditures." Senado, p. 1.

"This incidence is larger, if only the capital budget is considered, to the financing of which are destined by law the resources received from copper exports, and amounts to 32.5 per cent of the entries available for investment expenditures." Senado, p. 1.

The revenue contribution has an explicit and an implicit component. The explicit contribution is composed of the various taxes paid to government which are explicitly recorded in its budgets. These taxes can be further subdivided into income taxes and surtaxes. Government has used three types of income taxes as instruments in increasing the revenue contribution: explicit income, explicit extraordinary income taxes, and explicit taxes earmarked for particular projects. We define as implicit revenue contribution the tax paid to government as a result of sale of foreign exchange at an overvalued rate. This contribution is zero whenever there exists no overvaluation of the peso. It is referred to as an "implicit" contribution because, even though it exists, it is rarely entered as a revenue (and expenditure) in the government's budget. The implicit revenue contribution also has two components, one direct and another indirect. The direct implicit revenue contribution is defined as the amount of resources released to government as a result of the govern-

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<sup>1</sup>The relative importance of mining taxes has declined over time and the figures mentioned in these hearings under-estimate its earlier importance. Furthermore, these revenues have been consistently under-estimated due to overvaluation of the Chilean currency.

ment's policy of buying dollars from the Gran Minería at a low exchange rate and selling them to importers at a high rate. Furthermore, the indirect implicit revenue contribution is defined as the amount of resources released to government above and beyond those released due to the direct one as a result of its policy of buying dollars at an overvalued exchange rate and selling them at an overvalued rate. In other words, the direct implicit component is measured by the difference between the buying and selling rate, and the indirect implicit component by the difference between the selling and parity rates. If government buys a dollar from an American-owned company in return for twelve pesos, and sells this dollar to an importer for 30 pesos, when the parity exchange rate is 50 pesos for one dollar, the direct contribution is equal to 18 pesos per dollar traded (30 minus 12) and the indirect implicit revenue contribution is equal to 20 pesos per dollar traded (50 minus 30). The combined implicit contribution is equal to 38 pesos per dollar traded (50 minus 12).

Symbolically, these statements can be presented as follows:

$$(5.0) \quad T_c = T_{ce} + T_{ci}$$

where,  $T$ , stands for taxes,  $c$ , for copper, and,  $e$ , and,  $i$ , for explicit and implicit respectively. This identity measures the total resource release of the mining sector to government. Furthermore, explicit copper taxes are subdivided into income taxes ( $T_r$ ) and surtaxes ( $T_s$ ), that is,

$$(5.1) \quad T_{ce} = T_r + T_s$$

and, the implicit are subdivided into direct ( $T_f$ ) and indirect ones ( $T_g$ ):

$$(5.2) \quad T_{ci} = T_f + T_g.$$

In the remaining part of this section we will present the statistical evidence available concerning this contribution and discuss its evolution

in relation to growth.

A summary of the explicit revenue contribution, excluding surtaxes, is presented in Table 4.<sup>1</sup> As can be easily observed that during the First Period this contribution is incredibly low; lack of any positive action leads to a resource release to government of only 5.8 per cent (on the average) of the value of production. This tax flow, of \$8.1 million annually, compares unfavorably with the profit income flow abroad as measured by the \$30.5 million annual repatriated profits. If we assume that half of these repatriated profits accrued to the United States Government in the form of corporate profits, the annual "surplus" flowing to the United States Government, being around \$15 million, is a **little** more than double the "mining surplus" contributed to the Chilean Government.<sup>2</sup>

Table 4

<u>Explicit Government Revenue Contribution of Large-Scale Copper Mining</u> (In millions U. S. \$)			
		<u>Explicit Taxes Paid in Chile Excluding Surtaxes</u>	
		<u>Current Prices</u>	<u>1961 Constant Prices</u>
First			
Period: 1930-39	Total	35.5	80.8
	Average	4.6	8.1
Second			
Period: 1940-54	Total	428.5	557.9
	Average	28.6	37.0
Third			
Period: 1955-64	Total	909.1	929.9
	Average	90.9	92.9

Note: The magnitude of explicit taxes paid during the 1940-54 period, in constant prices, rises from \$37.0 to 49.7 million if miscellaneous local expenditures are included.

Source: Appendix Tables A and B.

<sup>1</sup> Table 4 includes income and other taxes excluding "surtaxes".

<sup>2</sup> To the extent that these American companies received credit from the United States Government for taxes paid in Chile, the mining surplus accruing to this government would be smaller.

Early during the Second Period, and for the reasons already mentioned, government proceeded to appropriate a larger share of the "surplus" previously enjoyed by the American owners. Government suddenly developed a keen interest in raising the copper sector's tax contribution and proceeded to use all the tools available in its arsenal to achieve this goal. The tax legislation and revenue contribution bear ample evidence of this change.

Beginning in 1939, one tax after another has been imposed on copper mining. Some, clearly designed to hit only the American-owned large-scale copper mines, were discriminatory. The explicit income taxes<sup>1</sup> were complemented by the explicit extraordinary income taxes,<sup>2</sup> and, once the Chilean Development Corporation was established, by the taxes earmarked for special uses.<sup>3</sup>

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<sup>1</sup>The copper mines were first affected by the 4th category tax established in Law No. 6.457, of January 1940, imposing a 9% tax on the net tax income derived from mining or metallurgical activities. According to the same Law No. 6.457, an additional 6% tax on profits, sales, or investment in Chile was imposed on them as being incorporated outside Chile. A 3% surcharge on both earlier taxes was introduced in December 1941, by Law No. 7.145, which introduced modifications of Law No. 6.457. In January 1944, Law No. 7.750 established an additional tax, for two years, of 1% for the tax of the 4th category and another of 1% for the additional tax. Most of the subsequent laws referring to the explicit income taxes, either extended the validity of these earlier laws or converted the additional taxes into regular ones.

<sup>2</sup>The explicit extraordinary taxes, which cannot be easily distinguished from the earlier category, were mainly two. In January of 1942, Law No. 7.160 established an extraordinary copper tax of 50% upon the increased taxable income realized, by the companies that produce copper in bars, as a result of any increase in sale price over the basic prices fixed by the same law. A further extraordinary tax of 30% on top of the existing income taxes on mining, which were to be paid in the second semester of 1954, was imposed on August 14, 1954, by Law No. 11.575.

<sup>3</sup>According to Law No. 6.334 of April 1939, which established the Chilean Development Corporation, and was subsequently amplified by Law No. 6.640 of 1941, the American Copper companies had to pay a surcharge of 12% over the tax of the 4th category, and one of 3% over the additional to go directly to the Corporation's budget.

Surtaxes were imposed only for a relatively short period, starting in 1951 and up to 1955, when Law No. 10.003 declared a surtax, of 3 cents per pound, equal to the price increase enjoyed by the copper companies since May 8, 1951. These surtaxes, which are disguised in the Appendix Tables under the item miscellaneous local expenditures, account for this item's spectacular rise during the 1952-55 period.

The impact of this maze of tax legislation on the mining sector's tax contribution was spectacular. The importance of taxes paid in Chile, plus miscellaneous local payments,<sup>1</sup> for the 1952-54 period as a percentage of the value of production (always expressed in 1931 constant prices) rose from 11.5 per cent, in 1939, to 14.0 per cent, in 1940, to 22.6 per cent in 1948, to 49.9 per cent in 1952, an all time high of 63.5 per cent in 1953, to finally fall to 33.6 per cent in 1954. The closing years of the Second Period, during which the happiness of the Chileans and the unhappiness of the Americans in the copper sector were rising as well as matching each other, were as unusual as the earlier laissez-faire years. Both situations could hardly reflect a long-run optimum division of the "surplus" since one party was always taking "too much".

During the Third Period, the average annual revenue contribution rose well above that of the previous period to \$92.9 million; still, as a percentage of total revenues, it fluctuated only around 25-30 per cent. In Table 5 we present the surplus that accrued to government on a global and per employee basis.

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<sup>1</sup>These local payments were composed almost totally of the 3 cent per pound surtax paid by the copper companies directly to the Chilean government.

Table 5

Mining Surplus Accruing to Government  
(1950-1960, Current Prices)

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
1 Surplus taxed away by government (Mill. of US\$)	44.0	55.1	110.6	71.0	73.2	161.3	130.6	76.9	53.2	85.5	88.1
2 Surplus contributed per person employed (thous. of US\$)	28.0	35.1	59.4	43.2	51.1	107.3	79.9	46.0	30.7	49.2	51.5

Source: The global surplus has been calculated by adding to taxes paid in Chile, as these appear in Appendix Table A, miscellaneous local expenditures for 1950-55, as appearing in the same table. Then, this global surplus was divided by the number of employees given in the table referring to the direct employment contribution and the per employee surplus was obtained.

The implicit component of the copper sector's tax contribution played also an important role in shaping the Government-Gran Minería relations and in affecting growth. As already mentioned, any deviation of the Company foreign exchange rate from the purchasing power parity rate gives rise to implicit taxes. For the Chilean copper industry, it has been argued, implicit taxes developed as a result of chronic inflation since 1939, plus a general rigidity of foreign exchange rates, and the multiple exchange rate system.

In order to measure, albeit not very accurately, this implicit tax contribution we have made use of four foreign exchange rates. First of all, we calculated a purchasing power parity exchange rate among the

dollar and peso by multiplying the official foreign exchange rate for 1928 by the percentage variation in the cost of living index.<sup>1</sup> This series, presented in Appendix Table M, Column I, will be referred to in the future as the parity rate.

Second, we will use the foreign exchange rate employed by CORFO in its estimates of the national accounts. This series, which is a weighted average of the various export and import rates, is presented in Appendix Table N, Column I. It will henceforth be referred to as the CORFO rate. Third, we have used the so-called Chilex and Andex rates which reflect the rates at which the respective companies have been converting dollars into local currency.<sup>2</sup>

The indirect implicit tax contribution, which is determined by the general degree of overvaluation of the Chilean currency, is measured by the difference between the parity and CORFO rates. The direct implicit one, which is determined by the overvaluation of the pesos purchased by the companies over and above the general overvaluation, is measured by the difference between the CORFO and Chilex-Andes (Company) rate. The total implicit contribution is, obviously, measured by the difference between the parity and Company rates.

We proceed next to review the statistical evidence. During the First Period, the Chilean peso is under-valued as compared to 1928. The parity rate is below both the Company and the CORFO rates, with the Company rate

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<sup>1</sup>In the appendix we present two such parity rates, one obtained by using the December to December cost of living changes, and another taking the differences between annual averages. There is no indication that use of the wholesale price index would have markedly changed the results.

<sup>2</sup>The relevant time series information is presented in Appendix Table M.



standing between the other two. The undervaluation increased slowly reaching a peak in 1936, a year in which the "implicit subsidy" received by Chilex amounted to 67.3 per cent and that received by Andes to 66.5 per cent of the parity rate; the undervaluation, which was smaller for the copper exporters than the Chilean importers, was reduced over the rest of the period but never fell to zero. Thus, even though the American copper companies received a smaller "implicit subsidy" than importers, which has been occasionally construed as discrimination, the generally held view that they were confronted with overvalued exchange rates for the peso finds no empirical support and is unfounded. The implicit subsidies prevailing during the First Period raised the "foreign income and expenditure" flows and adversely affected the "returned revenue" component.<sup>1</sup>

The peso remained undervalued until 1945 when, as a result of the relative rigidity of the official exchange rate and domestically rising prices, the CORFO and the parity rates were brought to equality. The conversion of the two rates has been, except for the already mentioned factors, accidental rather than a product of an intentional governmental policy.

During the years following 1945, the foreign exchange rate was effectively used as a discriminatory device against the Companies in an effort to control inflation and obtain a larger resource release for Chile. The

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<sup>1</sup>The official peso exchange rate fell from Ch.\$8 = US\$1, in 1928, to 32 = 1 in 1933, to 25 = 1 in 1939. The parity rate, on the other hand, gradually fell from an 8 = 1 relationship, in 1928, to 10.51 = 1 in 1933, to 13.42 = 1 in 1939. This provides an overall picture of the undervaluation.

exchange rate for the Gran Minería remained constant for a remarkably long period of fifteen years between 1937 and 1952;<sup>1</sup> the subsidies implicit in the peso undervaluation were slowly reduced and finally disappeared as the parity and Chilex-Andes rates reached equality in 1941-1942. Since then, the picture has been reversed with an increasing amount of implicit taxes being imposed on the large-scale copper sector.<sup>2</sup> The parity-Company rate difference reached, in 1952, a remarkable level of 83.1 per cent of the parity rate, and of 491.6 per cent, of the Company rate.<sup>3</sup> Stated more clearly in 1952, the average importer buying dollars paid approximately three times as many pesos per dollar<sup>4</sup> as the companies received when selling a dollar.<sup>5</sup> The overvaluation of the peso for the companies in 1952 by 83.1 per cent of the parity rate is the best measure that we can offer for the copper sector's global implicit tax contribution. Since it has been impossible to determine the exact magnitude of the direct implicit tax contribution, we can say that the peso contribution has always fallen short of the real one measured by using the parity rate since 1941-42. The indirect implicit component has been present ever since 1941-42.<sup>6</sup>

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<sup>1</sup>The Chilex-Andes rate remained fixed at a level of Ch.\$19.37 = U.S.\$1.

<sup>2</sup>The rate of peso overvaluation steadily rose from 1942 to 1952.

<sup>3</sup>See Table M, Column 6, of the Appendix.

<sup>4</sup>The CORFO rate was Ch.\$66 = US\$1.

<sup>5</sup>The Company rate was Ch.\$19 = US\$1.

<sup>6</sup>The degree of overvaluation of the peso to the American copper exporters diminished in 1953, rose in the three subsequent years, and then slowly fell to its lowest value in 1960. The tendency of the implicit tax contribution to decline, which started in the last years of the Second Period, continued well into the Third Period, but tended to stabilize. Still, it remained substantial. In 1964, when according to the parity rate an exporter should receive E<sup>0</sup>4.3 for a dollar, both American companies were receiving only E<sup>0</sup>1.8. The exchange rate was, nevertheless, uniform to all commodity exporters and specific discrimination had disappeared.

It is conceptually very difficult to compare the relative and absolute magnitudes of the explicit and implicit tax contributions. During the Second Period both components loomed large and, also, there appeared to be a substitutability between the two.

The immediate impact of higher explicit and implicit taxes has been a rise in the government revenue and/or the net foreign exchange contribution. As a result of the increased share of Chile and its government in the mining product and surplus, the welfare position of both increased. The rise in the government's explicit tax revenue increased the amount of resources at its disposal, even though the persistent government deficits suggest that the revenue contribution was never "enough". In the last section of this essay, we will deal with the use and direction of "surplus" appropriated by government. In the remaining paragraphs of the present one we will touch upon certain "growth aspects" of the implicit tax contribution, or, of the overvaluation.

Perhaps the most important effect of peso overvaluation has been the rising real cost of local inputs, be it labor or intermediate products.<sup>1</sup> But the rising real cost of labor to the Companies only rarely meant higher real wages to the employees since it approximately matched internal

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<sup>1</sup> During the First Period, when the peso was undervalued, the share of the legal cost of production's total value declined from 50.3 per cent in 1931, to 21.5 per cent in 1935, to 17.9 percent in 1937. During the Second Period when we moved from an under- to an overvaluation, the relative importance of this item rose (Table D, Column 6) from 24.5 per cent in 1940, to 38.7 per cent in 1946, 42.1 per cent in 1949, to a peak of 67.0 per cent in 1953. Overall, the share of labor, as measured by the legal cost of production, shows a significant and steady rise during the Second Period; and this appears to be directly caused by the rising implicit tax contribution.

inflation. Suppression<sup>1</sup> of copper mining, following the peso overvaluation, led to a continuing, occasionally violent struggle between the American employer-capitalists and Chilean employees in which each participant aimed at maintaining his income share. Both lost. Labor's increased share in dollar value added was not matched by an increased amount of peso value added;<sup>2</sup> and, worse, employment declined sharply as the profit earners economized both on labor and capital.<sup>3</sup> And the profit share declined in spite of the employers efforts to keep the wage bill under control. Still the profit rate was maintained at a positive, if not always satisfactory, level through a policy of minimum investment and capital stock and maximum repatriation of profits.<sup>4</sup>

With the copper mining sector as a definite and the American Capitalists a partial loser, and Chilean labor hardly a winner, the natural beneficiary of this clash-induced suppression of mining should have been government. But, even so, government does not seem to have won whatever the other

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<sup>1</sup>Suppression has been defined as the state of affairs where the value added of a sector is below its natural level, or, what it would have been without government intervention. The Chilean copper sector was suppressed insofar as its value added in pesos fell short of what it would have been had there been no overvaluation of the peso. Since the copper firms operated to a large extent in dollars, suppression was first experienced insofar as the peso-value added component was concerned, that is, the "legal cost of production" component of expenditures. By reducing the "peso-value added" value and permitting a rise in the peso costs, government automatically reduced the "dollar-value added" component. This aspect has been analyzed already in this essay.

<sup>2</sup>We have already noted that a major share of the legal cost of production consisted of payments to intermediate products and services.

<sup>3</sup>The decline in physical labor inputs will be documented in the section on employment effect. Professor Chipman has also shown in an unpublished study that copper firms have economized on capital as well.

<sup>4</sup>See Appendix Table O.

parties lost. True enough, the share of explicit taxes rose substantially between 1952 and 1955 (as a result of the surtaxes) but before 1952, this share increased far less rapidly than the consecutive mining taxes would suggest.<sup>1</sup> A number of factors contributed to this. Rising peso overvaluation reduced profits and taxes paid by raising the legal cost of production. We can even advance the hypothesis here that the overvaluation (implicit taxation) induced reduction in the profit share forcing government to impose more and more taxes just to maintain the sector's explicit tax contribution.<sup>2</sup> More important, nevertheless, has been the role of implicit taxation which led to a situation where a fourth party, namely buyers of **overvalued** foreign exchange, were the second and, occasionally, the first most important winners. The implicit taxes were, to a large extent, converted automatically into implicit subsidies on imports. Thus, the "resource release" forced upon labor, capital, and even government in the mining sector led to a net gain of the privileged group called importers.

This brings us to the last two points of this section. First, it is hypothesized here that government may "intentionally" transfer part of the mining "surplus" to importers if overvaluation of the peso provides it with the best instrument to maximize the "net foreign exchange contribution". Policy makers in Chile have been deeply concerned with the differential impact that implicit taxes have upon explicit taxes and upon the rest of returned revenue. They know well that a decline in implicit taxation will

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<sup>1</sup> And if we exclude the surtaxes for the 1952-55 period, this share falls.

<sup>2</sup> This hypothesis is supported by the fact that, in spite of successively new and higher taxes imposed on copper mining, the share of explicit taxes remains relatively unchanged between 1940 and 1949.

raise profits, consequently augment explicit taxes, and have a positive impact upon returned revenue; they also know that such a reduction will cause a decline in the legal cost of production, and consequently have an adverse impact upon returned revenue. Overvaluation of the peso and implicit taxation can be regarded as an efficient policy instrument only insofar as it leads to an optimum net foreign exchange contribution. In Chile, devaluation of national currency and the corresponding reduction in implicit taxation have normally had an adverse impact upon the net foreign exchange contribution because the devaluation-induced rise in profits, explicit taxes and investment have been more than compensated by a decline in the dollar value of the other local costs. Chilean authorities have thus tended to maximize the net foreign exchange contribution by passing on to importers a share of the "surplus" through overvaluation without necessarily maximizing the explicit government revenue contribution.

However, and this is the second point made here, such implicit taxation is likely to be inefficient in the sense that the gain in foreign exchange to the economy is more than compensated by the loss of control by government over the allocation of the mining surplus released. If "implicit taxes"<sup>1</sup> on copper are automatically and evenly converted into "implicit subsidies" on all imports, the lack of any growth or investment policy underlying such a behavior can be detrimental. If implicit taxation is not matched by implicit subsidies, that is, foreign exchange rates to importers are higher than those received by exporters, the government has a revenue source that can be used in favor of capital goods imports and

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<sup>1</sup> American copper companies prefer explicit income taxes because they can be offset against United States tax liabilities.

domestically supplied capital formation. As long as the foreign exchange rate applicable to importers over value, the local currency, implicit subsidies and an element of inefficiency, will be present. The Chilean experience shows that after the middle forties implicit subsidies have been continually present and that, even when multiple import exchange rates were present, government had no policy of favoring capital goods imports or, for that matter, domestic capital formation.

As a concluding remark we can say that the American-owned companies have felt as strongly against discriminatory foreign exchange rates as they did with respect to discriminatory taxes. They have even gone as far as to argue that they do not mind higher taxation as long as a uniform (that is, nondiscriminatory) foreign exchange rate applies both to them and to all other exporters. The Christian-Democratic Party Copper Plans have introduced such a uniform exchange rate. Unfortunately, the introduction of a uniform foreign exchange clause in a Ley-Contrato can have detrimental effects on non-copper exports. In order to increase and diversify exports, a policy of undervaluing the escudo for some exports may be an indispensable tool. There exists no economic justification for offering such a favorable exchange rate to copper exports. The type of foreign exchange policy that is likely to be needed in the future cannot be foreseen in a manner to permit such advance commitment. Thus, any surrender of policy power with respect to the determination of the foreign exchange rate to the American-owned companies is likely to impose in the future unanticipated policy constraints that are neither necessary to safeguard the companies' interests nor harmless to the economy.<sup>1</sup>

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<sup>1</sup> A guarantee that the companies will always be allowed to repatriate up to ten per cent of investment as depreciation and up to but not more than ten per cent as profits on invested capital is, in my personal opinion, the best solution.

4. The capital inflow contribution. There is a third, the capital inflow contribution, that has a resource availability effect. This contribution has two facets. One involves the inflow of capital through the Gran Minería to be invested in the mining sector itself. This has always been accepted as part of the Chilean share in copper output and the foreign exchange contribution of the sector. On a broader basis, the copper sector can stimulate the inflow of foreign capital to the Chilean economy. The state of affairs - the warmth or coldness - in the relations between government and the Companies serves as a barometer of Chilean attitudes towards foreign investors and indirectly determines the resource volume made available through the capital inflow.

Regarding the first aspect, there exists an unusual pattern. During the First Period, investment was extremely low even though there existed no discrimination. The percentage of profits reinvested gives an average propensity to save out of profits of thirty per cent, for the 1930-31 period, but of only around five per cent for 1936-40.<sup>1</sup> Sagging expectations, as a result of the depression-induced export collapse, were the main factor responsible for the low tide in reinvested profits.<sup>2</sup>

During the Second Period, when discrimination, overt and hidden, rose with time, investment remained conspicuously low, except for a sudden rise between 1948-53. The average propensity to save out of profits was around

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<sup>1</sup>See Table D, Column 1.

<sup>2</sup>The value of investment as a percentage of production value sags from 8.3 per cent in 1930 to less than 2.0 per cent after 1935. Ibid., Column 5.



six per cent between 1940 and 1947.<sup>1</sup> If 1941 is excluded, investment as a percentage of total profits rose to 20.8 per cent only in 1941. The propensity to save and reinvest out of profits climbed rapidly from 13.5 per cent in 1948, to 98.8 per cent in 1951, and to an impressive 207.6 per cent in 1953; it collapsed, however, to a dismal 1.4 per cent of profits in 1954. This apparently erratic and will-o'-the-wisp pattern of investment changes into a very smooth one once decomposed.

Investment consistently remained low. Foreign investors displayed, if the national accounts concepts are used, a negative propensity to save, since the large foreign income repatriation accentuated the deficit of the nation on current account.

However, when a rapid reduction in output was threatened in the Chuquicamata mine, building of the sulphuric plant raised investment and reinvested profits. This replacement investment created the discontinuities that give overall investment the will-o'-the-wisp pattern.

The propensity to save and reinvest out of foreign-earned profits rose substantially during the Third Period. During 1957 and 1958 the inflow of capital exceeded repatriated profits. During the other years excluding 1955, the propensity to save out of profits never fell below 33 per cent.<sup>1</sup> A major part of this investment was directed toward opening the El Salvador mine, which replaced the defunct one in Potrerillos, and, in that respect should be considered as replacement rather than new investment. Still, some new investment, which was by no means spectacular, did take place. The propensity to reinvest was slightly inflated during the Third Period

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<sup>1</sup> See Table D, Column 1.

<sup>2</sup> See Table D, Column 1.

because more liberal amortization allowances permitted American investors to repatriate increased resources without necessarily showing higher profits.<sup>1</sup>

The copper sector's ability to act as a magnet attracting foreign capital to the extractive activities and to the rest of the economy has not gone unnoticed. In his January 1965 interview with the influential Santiago newspaper El Mercurio, Raúl Saez estimated the total capital contribution of President Frei's copper projects to be between US\$200-300 million annually. Saez correctly stated that:

"...we must convince ourselves that if Government, Congress, and the People of Chile decide that these resources will be **destined** to finance only projects included in the extraordinary program (of the government), these 630 million escudos will be augmented by external credits and national and foreign private capital to give us an extraordinary investment effort of around 1000 million escudos a year."<sup>2</sup>

A major fraction of this capital inflow contribution would come outside the Chilean economy, would flow to all economic sectors, and all would lead to the "Chilean economic miracle" of achieving a 6.5 per cent annual growth.<sup>3</sup>

This brings us to the second facet of the copper sector's capital inflow contribution, namely non-mining foreign investment. An intimate interdependence is assumed to exist between the export sector's growth and profits and these foreign capital inflows. This interdependence,

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<sup>1</sup>One way to measure the real propensity to reinvest is to take the rate of investment over repatriated profits and amortization funds.

<sup>2</sup>See Raúl Saez, Chile y el Cobre, op. cit., p. 74. At the time this statement was made, the exchange rate was 3.20 escudos to one dollar. Consequently, E<sup>o</sup>630 = US\$200, and E<sup>o</sup>1000 = US\$300.

<sup>3</sup>Ibid., p. 74. This high growth rate would be achieved only for the period between 1970 and 1985.

which exists, has been changing over time. In the nitrate era, capital inflows were private, entering all economic sectors including government bonds, they were attracted by the convertibility, based on an export boom, and high returns. A lull in capital inflows set in after 1930 lasting until 1959. Some inflows existed in the interim period but on a much smaller scale than during the twenties. Stagnation of the copper sector, the government's general hostility towards foreign investors, and a tendency towards government-sponsored projects financed with public rather than private international assistance contributed to it. There is no doubt, therefore, that CORFO's electrification, iron and steel, petroleum, sugar beet and other major projects which were partially bankrolled through external credits, would not have been pursued without the explicit repayment guarantee which the dollar contribution of copper mining offered to foreign investors.<sup>1</sup> Still, these predominantly public **capital** inflows were always project-based and never massive.

A new era in foreign capital inflows was inaugurated in 1959-60. One component was short-term credits by overseas suppliers, an item that skyrocketed during 1959-62, and the United States foreign aid. Short-term credits were literally pushed upon Chile to permit an import extravaganza which was unique in the country's history. Without a growing copper sector, foreign creditors would not have easily given in to such a rapid accumulation of external debt. The second component, United States foreign aid, would not have come forth had the treatment given to the large-scale

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<sup>1</sup>For further details on this matter see the present author's essay on the "Twenty-five Years of the Chilean Development Corporation" in Ensayos Sobre Planificación published by the Instituto de Economía, University of Chile, 1967.

copper mines not improved considerably since 1955. Both types of capital inflow were related to the copper sector, but maybe for the first time, indirectly and to a smaller degree than ever before. Even so, foreign aid by the United States seemed to be inversely linked to the Chilean government's copper price policy after the direct involvement in South Vietnam.

Thus, even though the existing statistical evidence suggests a strong correlation between the fortunes of the export sector and the magnitude of gross capital inflows, it is difficult to provide an accurate measure of the size of these inflows generated by copper mining. Foreign capital is attracted by local investment opportunities and the fortunes of the export sector since these determine the possibility of repatriating profits and capital. The following rule of thumb is therefore suggested: the copper sector's relative contribution in inducing capital inflows is equal to the share of copper export earnings in total export proceeds. According to this criterion, the copper sector has contributed approximately 20 per cent of the capital inflows during the decade of the 1920's, and as much as 70 per cent of the total in some years during the decade of the 1950's.

5. The capital goods contribution. In an incomplete economic system, that is, in an economy that does not locally produce producer durables, the export sector functions as a quasi-capital goods sector. It makes available to the economy the capital goods that are not domestically produced. Copper mining was the par excellence Chilean quasi-capital goods sector. It is conceivable that the whole net foreign exchange contribution could be used to import capital goods and thus lead to a maximum capital goods contribution. The process by which the dollar proceeds of the copper export sector were converted into capital goods is analyzed in the

last section of this essay. We therefore turn now to a discussion of the profitability effect.

## II. The Profitability Effect.

The profitability effect of the copper sector results from three related contributions to overall growth. These are the market size, the factor release, and the productivity contributions.

The market size contribution is a real demand phenomenon and depends on size, rate of growth, and horizontal and vertical linkages of the copper sector with the domestic economy. Next to output increase, a maximum market contribution is the major declared objective of Frei's copper policy. The sector has horizontal linkages with other sectors through the demand for products of other sectors, generated by its payments to factors of production. The vertical linkages arise from the sector's demand for intermediate goods and use of its output as an intermediate product by other sectors.

The market size contribution has played a continuous and important role in influencing the government-company relationship. Government has always taken into consideration in its actions the sector's impact upon the Norte Grande and the O'Higgins provinces. After all, factor payments and demand for intermediate products largely sustain these areas. Furthermore, the companies, well aware of this dependence, have always pointed out the possible adverse effects of any excessive encroachment by government. In return, both regions and industries have quietly, but effectively, lobbied with the central government in favor of the American mines.

Government had two alternatives available to increase the market contribution. It could raise the real cost of Chilean labor inputs, or,

divert intermediate product demand from overseas to Chile through a "buy national" policy. Up to 1955, only one of these alternatives had been partially pursued. Still, although the real cost of labor had risen due to the peso overvaluation, the increase in the local wage bill was minor. The rise in the percentage importance of the legal cost of production<sup>1</sup> throughout the Second Period did not necessarily find expression in higher local real demand or a broad market for local products since the benefits realized accrued to a progressively smaller number of workers.

A change in the composition of intermediate demand in favor of its Chilean component can be measured indirectly, through the behavior of the item "expenditure outside Chile", or directly through the local expenditures other than labor. Expenditures outside Chile declined during the First Period, reached a bottom in the early forties, slowly rose towards the end of the Second Period, and finally reached extremely high levels, as compared to the past and as measured by their percentage importance in production value, during the Third Period.<sup>2</sup> Even miscellaneous local payments, which in part reflected purchases of intermediate products remained low up to 1955.<sup>3</sup> But, the intermediate product component of the legal cost of production must have risen. May we finally mention that some of the taxes were returned to the copper provinces through subsidies to small and medium-scale mining especially at the beginning of the Third Period, although their absolute value seems to have been rather small.

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<sup>1</sup>See the earlier discussion and Table D, Column 4.

<sup>2</sup>See Table D, Column 7.

<sup>3</sup>See Table D, Column 8. The reader is reminded that the spurt in the percentage value of this item between 1952 and 1955 is caused by the inclusion of the transitory copper surtax in this item.

The pattern reverses itself after 1955. The government pursued, for the first time, a "systematic" copper policy and one of its ingredients was a "buy Chilean" recipe for the Americans. The results were conflicting. Although the share of labor costs in output declined, a broad based gain in employment and real income had a market size effect. But, surprisingly, expenditures outside Chile, which included refining, insurance, transportation, and general expenditures rose to unprecedented levels.<sup>1</sup> The resulting deterioration in the composition of "intermediate product" demand was partially offset by the rising relative importance of local operating expenditures.<sup>2</sup>

On this matter, which was a source of pride to the Departamento de Cobre, the statistical information was complete and available. Little doubt existed that a buy national policy was successfully used to divert the intermediate demand for goods in favor of Chile. However, as previously mentioned, the intermediate demand for services moved in the opposite direction.<sup>3</sup> This policy was a subtle way of forcing the Gran Minería to return an increasing share of its mining revenues to Chile. The Andes Copper Mining Company had been successfully forced to reduce its imports for operating needs from \$7.5 million in 1956, or 58.1 per cent of the total, to \$4.7 million in 1964, or 30.3 per cent of the total. Braden

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<sup>1</sup> See for the statistical information on a company level, Boletín Núm. 21.773. Senado, op. cit., pp. 50-53.

<sup>2</sup> Ibid., pp. 50-53. Both the item "internaciones" as well as its two components, that is "operaciones" and "inversiones" go down for all three firms after 1955.

<sup>3</sup> This is one of the paradoxes of Chilean economic development. While the share of domestic services in both employment and value added has been rising, the "exported" or "exportable" component is either stagnant or declining.

Copper Company reduced its imports for operating needs from 67.5 per cent of the total in 1956, to 32.2 per cent in 1964. Its local operating expenditures rose in the meantime from \$6.2 million or 32.5 per cent in 1956, to \$14.2 million or 67.8 per cent in 1964.<sup>1</sup> The following table gives an overall picture of the "buy Chilean" policy of the Departamento de Cobre.

Table 6

National and Imported Acquisitions for Operating Needs  
Effected by the Copper Mining Enterprises of the Gran  
Mineria  
(In millions of U.S. dollars)

<u>Year</u>	<u>National Market</u>		<u>Imports</u>		<u>Total Purchases</u>
	<u>Value</u>	<u>Incidence</u>	<u>Value</u>	<u>Incidence</u>	
1956	24,269	31.1%	53,793	68.9%	78,062
1957	29,333	33.9	57,163	66.1	86,496
1958	24,666	42.5	33,403	57.5	58,069
1959	26,344	36.5	45,316	63.5	72,160
1960	33,004	41.5	46,519	58.5	79,523
1961	31,105	46.8	35,328	53.2	66,433
1962	44,479	56.8	33,794	43.2	78,273
1963	40,887	51.6	38,326	48.4	79,213
1964	45,398	55.6	36,197	44.4	81,595

Source: Departamento de Cobre.

Again, something like joint maximization was achieved with the American companies happily buying more Chilean products in return for lower taxes, better exchange rates, and more foreign services.

As a result, after 1955 the market size contribution to the copper provinces, local and other industries had been positive and rising. But, both before and after 1955 the copper sector made its largest market or real demand contribution through the resource transfer to Government and its preferred sectors.

<sup>1</sup> See Appendix Table A.



It is far more difficult to isolate the productivity contribution of the copper sector. To the extent that it is a technologically advanced and dynamic sector, a diffusion of its state of technology to the rest of the economy can be expected insofar as its presence exerts a pressure towards emulation. What can be clearly said is that suppression of the sector stimulated internal productivity gains in its efforts to survive. Overt discrimination turned it into the least inefficient sector and showed that room for input economizing is almost always available. Very little can be said about any spillover effect on the rest of ~~the~~ economy, either in terms of factor proportions or output-input relations. The proclivity of the public sector to adopt capital intensive projects may or may not have been influenced by the presence of a super-modern foreign-owned industry.

Finally, it is certain that government pressures on the companies to "buy Chilean", and the Companies insistence upon competitive prices, quality and delivery performance, have and will even more so in the future contribute to overall productivity gains in the economy.

### III. Factor Employment Effect

Copper replaced nitrate during the 1930's as Chile's export industry, but failed to become a major source of employment.

During the laissez-faire period, the labor employment contribution was positive, with a mild upward trend.<sup>1</sup> This trend was sharply reversed during the period of discrimination when total employment first rose from 21,798 workers in 1940, and 24,770 in 1943, but was then sharply reduced to only

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<sup>1</sup>See C. Reynolds in Copper, Essays, op. cit., p. 390.

14,320 in 1954, and 15,030 in 1955. This meant a reduction in the labor employment contribution by 34.3 per cent between 1940 and 1954, and by 42.2 per cent between 1943 and 1954.<sup>1</sup> Meanwhile, labor absorption by the medium and small-scale copper mining was close to spectacular as government proceeded to promote and subsidize the Chilean-owned modest mining operations.<sup>2</sup>

Once large-scale copper mining was restored from a suppressed to an equitably treated sector through New Deal Law 11,823 of May 6, 1955, its labor employment contribution became once more positive. As illustrated by the table below, the New Deal-induced investment and production boom raised employment in 1960 to 17,085 persons, a figure which, nevertheless, still fell short of total employment in the early forties - the years when active suppression began.

There is little or no evidence that government ever had an employment policy for the Large-Scale Copper Mining, or that it was aware of any terms of trade between copper taxes and copper employment. Only more recently, the potential labor employment contribution has been duly emphasized in President Frei's package of copper legislation. Raúl Sáez, the leading

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<sup>1</sup> See Mario Vera Valenzuela, La Política Económica del Cobre en Chile, (Santiago, Chile: Universidad de Chile, 1961), Table 1, p. 22, and also the table of the present section.

<sup>2</sup> The negative labor employment contribution of the Gran Minería was more than offset by the positive labor contribution of medium and small scale copper mining. Employment in these smaller mines more than tripled between 1940, when it employed 4,297 persons, and 1954, when employment amounted to 13,807, and almost quadrupled between 1940 and 1957 (absorbing 16,445 persons in the latter year). See Mario Vera Valenzuela, Ibid., Table 1, p. 22. The active promotion of medium and small scale copper mines by ENAMI (Empresa Nacional de Minería) has been partially responsible for the surge in employment.

DIRECT EMPLOYMENT CONTRIBUTION OF THE FOREIGN COPPER MINES AND RELATED  
STATISTICS (1950 - 1960)

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
1. Value of Foreign copper mining production (mil. US\$)	172.6	215.0	278.3	220.3	219.9	347.5	356.6	272.2	225.3	338.9	350.2
2. Purchase of intermediate goods and services (mil. US\$)	64.8	62.8	90.7	76.5	57.3	53.2	89.7	106.9	89.3	126.1	135.0
3. Value added (1-2) (mil. US\$)	107.8	152.2	187.6	143.8	162.1	294.3	268.9	165.3	135.5	212.8	215.2
4. Capital (mil. US\$)	183.5	197.1	194.9	202.9	196.8	206.9	254.4	254.8	275.3	305.0	321.0
5. Capital Output Ratio	1.7	1.3	1.1	1.4	1.2	0.7	0.9	1.5	2.0	1.4	1.5
6. Labor	15613	15686	15938	16427	14320	15030	16327	16691	17274	17315	17085
7. Value added labor ratio (thousand US\$ per person employed)	69.0	97.0	117.7	87.5	113.1	197.8	164.6	99.0	73.4	122.8	125.9
8. Capital - Labor ratio (thousand US\$ per person employed)	117.5	125.6	122.2	123.5	137.4	137.6	155.8	152.6	159.6	176.1	187.3

Notes (1) The figures in Row 1 were obtained from CORFO, Dirección de Planificación, Departamento de Investigaciones, Económicas, Cuenta de Producción de las Empresas Extranjeras Dedicadas a la Explotación de Cobre. Cuenta en dólares. (Santiago: CORFO, 1964) pp. 1-2, mimeo.

NOTES:

(Continued)

(2) Ibid, Pp. 1-2.

(3) Value added calculated by deducting row 2 from row 1.

(4) The capital stock figures were obtained from Chile, Senado de la Republica, Boletin No. 21773 Senado Informe de las Comisiones de Hacienda y Minería Unidas, p. 53. The value of capital does not include the value of payment for rights and ownership of the Chuquicamata deposits, which amounts to US\$ 93.9 million and appears in the books of Chile Copper Co. owner of Chile Exploration Co.

(5) Row 5 is the ratio of row 4 to row 3.

(6) The figures on labor reflect "total" employed in the foreign, large-scale copper mines. Two secondary sources were utilized to compile this series: First, Mario Vera Valenzuela, La Política Económica del Cobre en Chile (Santiago, Chile: Universidad de Chile, 1961). Table 1, p. 22. These figures which cover the periods 1940-1943, and 1954-1957, originate from CORFO's research department and are the sum of obreros and empleados employed. Second, Clark Reynolds, "Development Problems of an Export Economy. The Case of Chile and Copper", in M. Mamalakis and C. W. Reynolds, Essays on the Chilean Economy (Homewood, Illinois: Irwin, 1965), p. 392. The latter figures were obtained directly from the companies and whenever they overlap with the former are very close.

(7) Row seven is the ratio of row 3 to row 6.

(8) The capital - labor ratio was calculated by dividing row 4 by row 6.

(9) The reader should be warned that the figures on Copper mining production appearing in row one are not identical with either the official time series' published in Boletin, No. 21773 Informe de las Comisiones de Hacienda y Minería Unidas or those used by Mario Vera and Clark Reynolds. The production account prepared by CORFO, from which these figures were extracted, refers to the foreign copper enterprises in toto rather than only to their copper production activities. Thus, they include also the export value of molibdenum, gold, and silver which fluctuates between 1.5 and 4.0 per cent of these exports. Mainly for consistency reasons we have used the CORFO figures here. After all, taxes, wage payments and intermediate product expenditures as used in this Table and as utilized by Vera and Reynolds, refer to total production rather than copper production as these economists assume. The error, nevertheless, involved in talking about copper rather than copper-gold-silver-molibdenum taxes, production, exports, and investment is not likely to exceed a five per cent level. It should be known to the reader, nevertheless, that, with the exception of the present table, both in this essay and all other documents used, a comparison is made between figures referring just to copper, such as exports (where separation is easy), and figures referring to copper-molibdenum-gold-silver, such as taxes, labor costs and returned value.

copper expert, quantifies the future employment contribution of the recent 1966 promulgated projects as follows:

"The volume of projects which will have to be undertaken will give employment to a minimum of 10,000 workers and one or two times this quantity in the supplying industries."<sup>1</sup>

Even if these rather vague calculations turn out to be correct and the new copper projects materialize, government planners should not be disappointed if the net employment contribution turns out to be meager.

In this respect, large-scale mining is different from agriculture as well as industry, at least as these sectors are portrayed in current development literature. Unlike agriculture, it has no redundant or disguised labor, even though it possesses a phenomenal output "surplus". Thus, any governmental attempts to appropriate part of output neither need to be motivated by nor lead to a labor release. Although government discrimination starting in 1939-40, which forced the companies into defensive labor-saving technological innovations, had a negative employment effect, appropriation of the surplus need not have such an effect. The surplus appropriated rose between 1950-53, with no concurrent labor release, and also rose between 1954-56, and there was labor absorption. Furthermore, a labor release from mining is not desirable in Chile, since this labor is not disguisedly unemployed, its release will not increase the "surplus" available to government, and industry faces no labor bottlenecks that a labor release from mining can solve. In addition, any induced labor release gives rise to a Robinsonian disguised unemployment by forcing labor out of a high productivity sector into others of low productivity.

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<sup>1</sup> See Raul Saez, Chile y El Cobre (Santiago, Chile: Departamento del Cobre, 1965), p. 72.

Whenever a "product release" was accompanied by a "labor release", as in the forties, the labor release seems to have been caused by a misguided policy of excessive discrimination.

The difference between mining and "classical" industry lies in their differential ability to absorb labor. Chilean mining can become a major source of income growth, but still, as far as the foreign companies are concerned, contribute little in terms of direct employment. Industry, in contrast, is viewed, in the Leibenstein, Lewis, Ranis and Fei models as a source of productivity as well as employment gains. The Chilean scene is complicated by the fact that industry has tended to contribute little to employment since 1950, but a lot to output (through productivity), just as did large-scale copper mining.

Chilean large-scale copper mining has a very low capital-output ratio. It is capital rather than labor intensive but more than anything else it has been input-saving over time. Thus, even in the future, its growth is likely to require small doses of imported capital goods as compared to most other Chilean sectors while contributing an unmatched "surplus" to the economy's development fund.

### Part III

#### The Gran Minería and the Saving-Investment Process

The process by which the Chilean copper export sector has affected the saving-investment process is almost completely unknown. This section, therefore, specifically attempts to describe the mechanism which permits the resources made available by it to be converted into investment.

The major issues related to this mechanism are four. The first relates to the role of payments to foreign factors of production, principally engaged in copper exploitation, in the saving account and the "formation" of national saving. The second deals with the nature and growth impact of copper mining investment. The third issue relates to the allocation and use of the mining sector's revenue contribution by the central government. And, finally, the last issue relates to the allocation or use of foreign exchange released by the Gran Minería to the Central Bank.

#### A. The Role of Foreign Income in the Determination of National Saving.

Payments to overseas factors of production affect the saving account in a round about way. Insofar as they lead to a deficit of the nation on current account, which is deducted from gross domestic saving to obtain gross national saving, they contribute to smaller gross national savings.

If imports plus net factor income paid abroad is smaller than exports, national saving exceeds domestic saving. If imports plus factor income paid abroad exceeds exports, then the deficit of the nation on current account is positive and national saving is smaller than domestic saving. The size of factor income paid abroad plays therefore a crucial role in the determination of the surplus of nation on external account.

Interestingly enough, factor income paid abroad was very high in the forties but both these payments as well as those arising from imports were financed out of export revenues. As a result, there developed no deficit of the nation on external account. In contrast, permanent deficits of the nation on external account developed since the early 1950's, as a result of the economy's rising appetite for imports and the government's and Central Bank's willingness to satisfy them, even though factor income paid abroad was meanwhile declining. There apparently exists no direct relationship between the level of income paid abroad and the difference between gross domestic and national saving.

These payments diminished both national income and wealth and the supply of resources potentially convertible into investment. This leakage was the aftermath of the heavy reliance on foreign resources to promote overall and specifically mining growth.

B. Investment in Large-Scale Copper Mining. Measured by almost any standard this investment has been low. The pattern is not, nevertheless, consistent. Investment is high in 1930, 1941, 1952-55, and 1957-59. There exists no continuous flow of investment into the mining sector. The very low flow during the Second Period was interrupted at the peak of discriminatory treatment (1952-55), and during the Third, the sudden rise in investment was as short-lived as the earlier one (1956-58). In short, suppression and equitable treatment had almost the same impact on investment, the first failing to eliminate it, and the second to raise it.



Table 8

Value of Investment in Large-Scale Copper Mining

		Current Prices	1961 Constant Prices
First			
Period: 1930-39	Total	12.9	27.0
	Average	1.3	2.7
Second			
Period: 1940-54	Total	160.9	189.5
	Average	10.7	12.6
Third			
Period: 1955-64	Total	251.1	253.3
	Average	25.1	25.3

Source: Appendix Tables A and B.

The lack of a smooth, large, and continuous investment flow can be attributed to various factors. First, risk and uncertainty, even after the New Deal Law of 1955, remained high. Past experience did not preclude future discrimination and the Frei-Allende encounter of 1964 reinforced past fears about long-run uncertainty. It can be said that practically all investment between 1930 and 1965 has been of a short-term nature in the sense that it committed little capital and capital recovery was close to immediate. The desire of the Companies to enter into Ley-Contrato agreements with the Chilean government are an expression of the high risk and uncertainty of the past and could for the first time attract long-term investment by both reducing and stabilizing these. After all the threat of de jure nationalization was always hanging over their heads and changing taxes, foreign exchange rates, and administrative regulations were the other half of the Democlean sword. Second, replacement investment, when no new investment took place, came in a discontinuous pattern which accounted for the sudden rises. Third, the capital-intensity of

large-scale mining operations, if measured by the capital-output ratio, has been extremely low in spite of the diminishing quality of copper ores. Thus, even increases in output could be achieved in the future without capital commitments that would be exorbitant in terms of output obtained. Fourth, the succession of a major world depression, war-induced copper-price fixing, and heavy discrimination made the sector an unfortunate and unwilling partner in the economic and power game played between the Colossus of the North and Chile and prevented it from controlling its own destiny. Finally, it should be mentioned that a sound copper investment policy leading to a joint maximization solution has yet to be developed.

As a result of the above factors, and the often forgotten truth that Americans invested in copper to make money and not for charity, the propensity to reinvest out of profits, whether these were high or low, was low with a few exceptions. These exceptions, in 1930, 1949-53, and 1956-64, failed to make a major dent in the outflow of foreign-earned income from Chile. For fourteen years the propensity to reinvest has been below one per cent.

Before concluding this section, I would like to raise two more issues. Investment in the copper mines has two components: foreign supplied and internally supplied capital goods and complementary products and services. One peculiarity of copper investment is that a major component is internally supplied but externally financed. All economists that have analyzed the copper industry have made, in my opinion, the erroneous assumption that "national saving" is low and that "external savings" were, therefore, indispensable.

Two issues are involved in this argument. One refers to the internal

availability of the ingredients necessary to produce investment goods in Chile. The other concerns the income release (saving) by nationals to finance the production of these investment goods. It is argued here that both the availability and saving are substantially higher than what they are normally believed to be.

As regards the first point, a major segment of capital formation in mining is internally supplied. For example, when Andes Copper Mining Co. submitted its investment budget for the "El Salvador" mine, the internally supplied component was estimated to be 62 per cent of the total;<sup>1</sup> and analysis of the various investment items indicates that it could be even higher. Foreign investment was, insofar as the availability aspect is concerned, only necessary for 38 per cent of the capital formation. Chile possessed the real resources needed for the remaining part of investment.

On the second issue, which is the center of controversy, the answer is more complicated. May I first point out that Chilean writers express a desire of maximum external financing of internally supplied capital formation. Mario Vera, using Departamento de Cobre statistics argues that out of total investment 73 per cent refers to imports and "the rest, as little as 27 per cent, to sale of foreign exchange for the acquisitions within the country."<sup>2</sup> The naive argument that Chileans are not willing or capable to save<sup>3</sup> implies that Chileans have been given a choice and are

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<sup>1</sup> See República de Chile - Ministerio de Minería. Santiago, 2- de Agosto de 1958. Decreto N° 132. D.O. de 12 de Septiembre, 1958.

<sup>2</sup> Mario Vera, Política Económica, op. cit., p. 130.

<sup>3</sup> This argument, which is generally accepted but not supported either by theory or statistical evidence, has been questioned by Markos Mamalakis in Public Policy, Essays, op. cit., 71 ff., 176 ff.

not willing to give up consumer in favor of capital goods production. External financing for the internally-supplied component of capital formation is necessary because it makes available the consumer goods required to feed those employed in capital goods production.

There are a number of flaws in this argument. First of all, Chileans have never been given a choice for "saving" in the Gran Minería de Cobre. The Companies did not want it and Government, victim of the "low saving" consensus, did not consider this alternative. Secondly, even if the household sector could not provide this "saving", a small fraction only of the Social Security System Revenues or the government subsidies to the State Railroad system would be sufficient to cover all the "external financing" that has taken place. Government never seemed to balance its expenditures in terms of social costs and benefits and consequently this possibility has been never considered. Third, the Departamento de Cobre has an obsession with the balance of payments bottleneck and considers maximum "external financing" to be the best tool to augment foreign exchange balances. This short-term "balance of payments" argument ignores the bitter truth that the arrangements with the Gran Minería force the country to return between 3-10 units of foreign exchange for every unit of foreign-financed but internally-supplied capital formation. Thus, it appears that for a small amount of present consumption Chile is willing to give up a large amount of future.<sup>1</sup> I would, therefore, argue that there exist significant economic factors making Chilean participation in copper investment desirable and feasible. The latest copper projects are the first ones with "joint participation."<sup>1</sup>

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<sup>1</sup> See Table entitled Total Investment.

We may finally mention that the ratio of profits to investment has been exceptionally high for all three periods under consideration.<sup>1</sup>

C. Allocation of Copper Tax Revenues. The Copper tax revenues were used to purchase both externally and domestically supplied capital goods.

The copper tax contribution affected the imported component of capital formation in a number of ways. First, part was directly used to import capital goods for investment purposes. The Central Government had a segment of its budget expressed in dollars and used it to cover the foreign exchange needs of itself and the autonomous public institutions. Part of these revenues here directly channeled to CORFO, the Universities, and the mining provinces, presumably to facilitate imports of necessary goods. Quite often copper funds are earmarked for development projects,<sup>2</sup> such as education, which do not augment capital but increase productivity through investment in human capital. Second, the copper "surplus" has been used to cover service and amortization payments of the public sector. It also directly served as a guarantee for all CORFO sponsored international borrowing and as such acted as its stimulant. Third, part of these revenues were converted into local currency to be used for local investment. Since conversion was normally at a below-parity-rate level, local capital formation suffered. But even more important, part of these revenues have been used for consumption rather than investment purposes.

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<sup>1</sup> The excess of repatriated profits over investment for most of the years suggests that Chile(ans) have been giving up both present and future consumption without any important compensation.

<sup>2</sup> When Chile raised its copper price from 62 to 70 cents per pound on June 14, 1966, the El Mercurio quoted Sergio Molina, the Minister of the Treasury as saying that the increased revenues of \$20 million "will be employed to amortize short and medium term debts and to cover extraordinary investments." See "Precio del Cobre Chileno Fue Elevado a Setenta Centavos" El Mercurio, June 15, 1966, p. 27.

As we have already seen the surplus appropriated by government has been phenomenal and its proper use could have led to a substantially higher capital formation.

We may mention here that the resource transfer necessary to cover the deficit of the State Railroads during 1960-64 absorbed between 60-80 per cent<sup>1</sup> of the copper "surplus". This shows that unless a higher degree of efficiency is achieved in various branches of the public sector higher tax revenues are likely to contribute little to growth. Raul Saez confirms this inefficient state of affairs when he writes: "I wish such a substantial increase in fiscal resources could be used in a high proportion for capital formation and production of export goods precisely in order to reduce Chile's dependence on its copper activities."<sup>2</sup>

D. Allocation of Copper Foreign Exchange Revenues of the Central Bank.

The allocation of these dollars released to the Central Bank establishes the size of the copper sector's capital goods contribution outside the government sector. As previously mentioned mining performs as a quasi-capital goods sector by making available to the economy the machinery and equipment that is not domestically produced.

What proportion of these dollar earnings will be used for capital goods imports is determined by the country's import policy, as this is formulated by the Central Bank. Regarding the externally supplied component of capital formation this import policy is tantamount to an investment policy.

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<sup>1</sup> See Appendix Table B, Column 6, the Chilean National Accounts information, and the present author's La Teoría de los Choques Entre Sectores (Santiago, Chile: Instituto de Economía, Universidad de Chile, 1966) p. 32n.

<sup>2</sup> Raúl Saez, op. cit., p. 13.

Once an import policy has been fixed, an independent investment policy is infeasible. For the same reason, any changes in the copper policy will have no impact on the investment policy unless they operate through the import policy. All the economists who have dealt with the problem identify copper with the investment policy instead of recognizing that the import policies determine part of investment and that the copper and import (i.e. investment) policies have rarely or never been coordinated.

A key structural bottleneck that has restricted Chilean economic growth has been its "socially oriented" import policy. It has either maintained the status quo insofar as capital goods imports were concerned, or favored consumption. The import policy in Chile was a major factor in determining the allocation of dollar funds between future (investment) and present consumption, and has tended to favor the second alternative.

This brings us back to the relationship between the resource distribution and resource allocation process. The distribution of mining income between Chile and the rest of the world has been determined by the terms of trade between local and foreign factors of production. Government was able to change these terms of trade in favor of Chile and thus transfer an increasing "surplus" to Chile. Resources were transferred out of mining in the same manner as if they had been transferred out of agriculture. The resource release condition, a necessary one for growth, was satisfied. But since Chile was an incomplete economic system, the necessary and sufficient condition for growth was a resource release and allocation into imported producers durables. The rigid import policy did not permit the sufficient condition to be satisfied and the "allocation" process was intercepted.

Thus, in an incomplete system such as Chile's, it cannot be assumed that the resource release and allocation processes are integrated.<sup>1</sup> Rather attention should be focused on the allocation process because a resource release that exceeds the needs of any given allocation policy can place further constraints on such a policy by, e.g., increasing the country's needs for imported consumer goods.

We may conclude this section by pointing out that in an economy such as Chile's a "resource surplus" does exist. This "surplus" can be released rather easily, but its use for development purposes may be blocked by the absence of a proper "allocation process" or policy. Therefore, no matter how successful government might be in raising the sector's foreign exchange and/or government revenue contribution, it cannot succeed in promoting growth unless it pursues a correct allocation policy.

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<sup>1</sup>This is the basic assumption of the Labor Surplus model by Ranis and Fei.



Table A.

Value of Production and its Components in Large-Scale Copper Mining  
(In millions of U.S. \$, current prices)

	1 Value of Production <u>Mill. U.S.\$.</u>	2 Value of Investment	3 Yearly Profits	4 Amorti- zation	5 Expendi- tures Out- side Chile
1930	59.1	4.9	17.5	5.4	3.0
1931	28.6	.6	1.8	3.8	2.0
1932	15.5	.8	-6.4	3.4	1.0
1933	22.5	.1	-1.9	3.6	1.7
1934	33.6	.6	6.5	4.2	2.6
1935	45.9	-	10.6	5.1	3.5
1936	41.8	.5	12.9	4.1	2.9
1937	99.9	1.9	48.2	5.5	4.8
1938	74.1	1.2	26.9	5.2	4.2
1939	71.9	1.3	21.4	4.7	4.4
1940	85.1	1.2	29.5	5.1	5.4
1941	101.1	6.6	31.6	6.7	2.1
1942	117.4	1.1	32.4	6.1	1.2
1943	116.8	1.3	27.1	5.6	1.2
1944	122.0	2.0	25.4	6.7	1.3
1945	106.7	1.3	18.8	6.0	1.8
1946	109.6	1.5	21.6	5.6	2.0
1947	159.4	2.0	35.0	5.6	5.7
1948	215.5	6.6	48.8	5.8	8.3
1949	155.3	22.4	26.5	4.7	6.4
1950	168.5	24.7	30.2	4.5	7.3
1951	196.2	38.8	39.2	4.3	7.1
1952	199.9	30.9	35.4	5.3	6.2
1953	113.9	20.2	9.7	2.7	7.3
1954	220.8	0.3	19.1	2.7	8.2
1955	301.5	2.3	54.8	2.5	15.0
1956	332.1	26.7	75.8	8.4	20.1
1957	262.3	46.3	37.9	12.5	28.0
1958	232.9	54.2	27.2	12.7	25.7
1959	315.8	39.1	55.9	20.5	31.4
1960	335.0	16.1	47.8	25.9	35.8
1961	301.0	17.2	35.4	14.6	33.1
1962	324.5	14.6	43.5	21.6	35.2
1963	327.0	18.7	39.3	27.4	34.6
1964	363.5	15.9	48.1	26.7	36.6
1930-39 Total	492.9	12.9	137.6	45.2	30.1
Average	49.3	1.3	13.8	4.5	3.0
1940-54 Total	2188.2	160.9	430.7	77.5	67.2
Average	145.9	10.7	28.7	7.7	4.5
1955-64 Total	3095.6	251.1	465.7	172.8	295.6
Average	309.6	25.1	46.6	17.3	29.6
1927-30 Total			125.8		
Average			31.5		

Table A.  
(continued)

Value of Production and its Components in Large-Scale Copper Mining  
(In millions of U.S. \$, current prices)

	6	7	8	9	10
	Taxes paid in Chile	Legal Cost of Production	Miscel- laneous Local Payments	Net Foreign Exchange Contribution A = 6+7+8	Net Foreign Exchange Contribution B = 9 + 2
1930	3.3	23.3	.1	26.7	31.6
1931	0.5	14.4	.0	14.9	15.5
1932	0.5	6.2	.0	6.7	7.5
1933	0.8	7.0	.0	7.8	7.9
1934	1.5	9.9	.0	11.4	12.0
1935	1.5	9.9	.0	11.4	11.4
1936	2.8	10.3	.0	13.1	13.6
1937	11.0	17.9	.0	28.9	30.8
1938	5.3	19.2	.1	24.5	25.7
1939	8.3	18.8	.1	27.1	28.4
1940	11.9	20.8	.1	32.8	34.0
1941	17.4	25.7	.1	43.2	49.8
1942	25.3	34.2	.8	60.3	61.4
1943	22.8	43.8	.9	67.5	68.8
1944	22.8	44.7	1.0	68.5	70.5
1945	18.1	43.1	1.0	62.2	63.5
1946	17.5	42.4	1.0	60.9	62.4
1947	37.4	50.8	1.3	89.5	91.5
1948	48.7	70.4	1.8	120.9	127.5
1949	26.1	65.4	1.6	93.1	115.5
1950	42.2	64.2	1.8	108.2	132.9
1951	47.1	70.2	8.0	125.3	164.1
1952	43.0	75.1	57.6	175.7	206.6
1953	17.5	76.3	53.5	147.3	167.5
1954	30.7	69.7	43.5	143.9	144.2
1955	121.0	59.6	40.3	220.9	223.2
1956	130.6	67.8	3.2	201.6	228.3
1957	76.9	69.4	5.1	151.4	187.7
1958	53.2	60.0	6.8	120.0	174.2
1959	85.5	80.6	5.5	171.6	210.7
1960	88.2	98.0	6.2	192.4	208.5
1961	72.9	99.0	8.2	180.1	197.3
1962	89.3	107.5	9.6	206.4	221.0
1963	86.4	99.4	7.9	193.7	212.4
1964	105.1	119.8	10.0*	234.9	250.4
1930-39 Total	35.5	136.9	.3	172.5	184.4
Average	3.6	13.7	.03	17.3	18.4
1940-54 Total	428.5	796.9	174.0	1399.3	1560.2
Average	28.6	53.1	11.6	93.3	104.0
1955-64 Total	909.1	861.3	102.8	1873.0	2113.7
Average	90.9	86.1	10.3	187.3	211.4

Table A.  
(continued)

Value of Production and its Components in Large-Scale Copper Mining

NOTES: \* Estimate

SOURCE: Boletín Num. 21.773, Senado, Informe de las Comisiones de Hacienda y Minería, Unidas, op. cit., Table 2c, p. 34, for column 1; Table 2a, p. 48, for column 2; Table 2h, pp. 45-46, for column 3; Table 2d, pp. 46-47, for column 4; Table 2f, pp. 44-45, for column 5; Table 2e, pp. 41-42, for column 6; Table 2g, pp. 43-44, and C. Reynolds, p. 367, in M. Mamalakis and C. Reynolds, op. cit., for column 7; C. Reynolds, Ibid, p. 369 and, Senado, op. cit., p. 53 (sum of columns under Descuentos (Art. 26 + Desccto 1c. dol electrolit.)) for column 8; Expenditures outside Chile for the years 1930-31-32 were estimated by the present author to be equal to 3.0, 2.0, and 1.0, million U.S. \$ respectively.

Table B.

Value of Production and its Various Components in Large-Scale Copper Mining  
In 1961, constant prices  
(\$ U.S. Millions)

	1 Value of Production (\$ U.S. mill)	2 Value of Investment	3 Yearly Profits	4 Amorti- zation	5 Expendi- tures Out- side Chile
1930	125.5	10.4	37.2	11.5	6.4
1931	71.8	1.5	4.5	9.5	5.0
1932	43.6	2.3	-18.0	9.6	2.8
1933	62.5	0.3	-5.3	10.0	4.7
1934	82.1	1.5	15.9	10.3	6.4
1935	105.0	-	24.3	11.7	8.0
1936	94.7	1.1	29.3	9.3	6.6
1937	212.1	4.0	102.3	11.7	10.2
1938	172.7	2.8	63.2	12.1	9.8
1939	170.7	3.1	50.8	11.2	10.5
1940	198.3	2.8	68.8	11.9	12.6
1941	211.9	13.8	66.2	14.0	4.4
1942	218.2	2.0	60.2	11.3	2.2
1943	207.4	2.3	48.1	9.9	2.1
1944	215.1	3.5	44.8	11.8	2.3
1945	184.6	2.2	32.5	10.4	3.1
1946	166.3	2.3	32.8	8.5	3.0
1947	197.0	2.5	43.3	6.9	7.0
1948	246.0	7.5	55.7	6.6	9.5
1949	185.6	26.9	31.9	5.6	7.7
1950	194.7	28.5	34.9	5.2	8.4
1951	203.5	40.2	40.7	4.5	7.4
1952	213.3	32.9	37.8	5.7	6.6
1953	123.2	21.8	10.5	2.9	7.9
1954	238.4	0.3	20.6	2.9	8.9
1955	324.5	2.5	59.0	2.7	16.1
1956	346.2	27.8	79.0	8.8	21.0
1957	265.7	46.9	38.4	12.7	28.4
1958	235.7	54.8	27.5	12.9	26.0
1959	314.8	39.0	55.7	20.4	31.3
1960	333.7	16.0	47.6	25.8	35.7
1961	301.0	17.2	35.4	14.6	33.1
1962	323.5	14.5	43.4	21.5	35.1
1963	327.0	18.7	39.3	27.4	34.6
1964	362.0	15.9	48.0	26.6	36.5
1930-39 Total	1140.7	27.0	304.2	106.9	70.5
Average	114.1	2.7	30.4	10.7	7.1
1940-54 Total	3004.5	189.5	628.8	118.1	93.1
Average	200.3	12.6	41.9	7.9	6.2
1955-64 Total	3134.9	253.3	473.3	173.4	297.8
Average	313.5	25.3	47.3	17.3	29.8

Table B.  
(continued)

Value of Production and its Various Components in Large-Scale Copper Mining  
In 1961, constant prices  
(\$ U.S. Millions)

	6	7	8	9	10
	Taxes paid in Chile	Legal Cost of Production	Miscel- laneous Local Payments	Net Foreign Exchange Contribution A = 6+7+8	Net Foreign Exchange Contribution B = 9 + 2
1930	7.0	49.4	.2	56.7	67.1
1931	1.3	36.1	.0	37.4	38.9
1932	1.4	17.5	.0	18.9	21.1
1933	2.2	19.4	.0	21.7	21.9
1934	3.7	24.2	.0	27.9	29.3
1935	3.4	22.6	.0	26.1	26.1
1936	6.3	23.3	.0	29.7	30.8
1937	23.4	38.0	.0	61.4	65.4
1938	12.4	44.7	.2	57.1	59.9
1939	19.7	44.6	.2	64.4	67.5
1940	27.7	48.5	.2	76.5	79.3
1941	36.5	53.9	.2	90.6	104.4
1942	42.4	63.6	1.5	112.1	114.1
1943	40.4	77.8	1.6	119.9	122.2
1944	40.2	78.8	1.7	120.8	124.3
1945	31.3	74.6	1.7	107.8	109.9
1946	26.6	64.3	1.5	92.4	94.7
1947	39.7	62.8	1.6	110.6	113.1
1948	55.5	80.4	2.1	138.0	145.5
1949	31.3	78.6	1.9	111.9	138.8
1950	48.7	74.2	2.1	125.0	153.6
1951	48.9	72.8	8.3	129.9	170.2
1952	45.0	80.1	61.4	187.5	220.4
1953	18.9	82.6	57.9	159.4	181.2
1954	33.1	75.3	46.9	155.6	155.7
1955	131.0	62.2	43.3	237.7	240.2
1956	141.0	70.8	3.3	210.2	238.5
1957	77.9	70.3	5.2	153.3	190.1
1958	53.8	60.7	6.9	121.4	176.3
1959	85.2	80.4	5.5	171.1	210.0
1960	87.8	97.6	6.2	191.6	207.7
1961	72.9	99.0	8.2	180.1	197.3
1962	89.0	107.2	9.6	205.8	220.0
1963	86.4	99.4	7.9	193.7	212.4
1964	104.9	119.6	10.0	234.4	249.9
1930-39 Total	80.8	319.8	.8	401.3	428.0
Average	8.1	32.0	.1	40.1	42.8
1940-54 Total	557.9	1068.3	190.6	1838.0	2027.6
Average	37.0	71.2	12.7	122.5	135.2
1955-64 Total	929.9	867.2	106.1	1899.3	2142.4
Average	92.9	86.7	10.6	189.9	214.2

Table C.

Indices (1930 = 100)

	<u>Value of Production (\$ U.S. mill.)</u>	<u>Value of Investment</u>	<u>Yearly Profits</u>	<u>Amorti- zation</u>	<u>Expendi- tures Out- side Chile</u>
1930	100.0	100.0	100.0	100.0	100.0
1931	57.2	14.4	12.1	82.6	78.1
1932	34.7	22.1	-48.4	83.5	43.8
1933	49.8	2.9	-14.2	87.0	73.4
1934	65.4	14.4	42.7	89.6	100.0
1935	83.7	-	65.3	101.7	125.0
1936	75.5	10.6	78.8	80.9	103.1
1937	169.0	38.5	275.0	101.7	159.4
1938	137.6	26.9	169.9	105.2	153.1
1939	136.0	29.8	136.6	97.4	164.1
1940	158.0	26.9	184.9	103.5	196.9
1941	168.8	132.7	178.0	121.7	68.8
1942	173.7	19.2	161.8	98.3	34.4
1943	165.3	22.1	129.3	86.1	32.8
1944	171.4	33.7	120.4	102.6	35.9
1945	147.1	21.2	87.4	90.4	48.4
1946	132.5	22.1	88.2	73.9	46.9
1947	157.0	24.0	116.4	60.0	109.4
1948	196.0	72.1	149.7	57.4	148.4
1949	148.7	258.7	85.8	48.7	120.3
1950	155.1	274.0	93.8	45.2	131.3
1951	162.2	386.5	109.4	39.1	115.6
1952	170.0	316.3	101.6	49.6	103.1
1953	98.2	209.6	28.2	25.2	123.4
1954	190.0	2.9	55.4	25.2	139.1
1955	258.6	24.0	158.6	23.5	251.6
1956	275.9	267.3	212.4	76.5	328.1
1957	211.7	451.0	103.2	110.4	443.8
1958	187.8	526.9	73.9	112.2	406.3
1959	250.8	375.0	149.7	177.4	489.1
1960	265.9	153.8	128.0	224.3	557.8
1961	239.8	165.4	95.2	127.0	517.2
1962	257.8	139.4	116.7	187.0	548.4
1963	260.6	179.8	105.6	238.3	540.6
1964	288.4	152.9	129.0	231.3	570.3

Table C.  
(continued)

Indices (1930 = 100)

	<u>Taxes Paid in Chile</u>	<u>Legal Cost of Production</u>	<u>Miscel- laneous Local Payments</u>	<u>Net Foreign Exchange Contribution A = 6+7+8</u>	<u>Net Foreign Exchange Contribution B = 9 + 2</u>
1930	100.0	100.0	100.0	100.0	100.0
1931	18.6	73.1	0	65.9	58.0
1932	20.0	35.4	0	33.3	31.4
1933	31.4	39.3	0	38.3	32.6
1934	52.9	49.0	0	49.2	43.7
1935	48.6	45.7	0	46.0	38.9
1936	90.0	47.2	0	52.4	45.9
1937	334.3	76.9	0	108.3	97.5
1938	177.1	90.5	100.0	100.7	89.3
1939	281.4	90.3	100.0	113.6	100.6
1940	395.7	98.2	100.0	134.9	118.2
1941	521.4	109.1	100.0	159.8	155.6
1942	605.7	128.7	750.0	197.7	170.0
1943	577.1	157.5	800.0	211.5	182.1
1944	574.3	159.5	850.0	213.1	185.2
1945	447.1	151.0	850.0	190.1	163.8
1946	380.0	130.2	750.0	162.9	141.1
1947	567.1	127.1	800.0	195.1	168.5
1948	792.9	162.8	1050.0	243.4	216.8
1949	447.1	159.1	950.0	197.4	206.9
1950	695.7	150.2	1050.0	220.5	228.9
1951	698.6	147.4	4150.0	229.1	253.7
1952	642.9	162.1	30700.0	330.7	328.4
1953	270.0	167.2	28950.0	281.1	270.0
1954	472.9	152.4	23450.0	274.4	232.0
1955	1871.4	125.9	2165.0	419.2	358.0
1956	2014.3	143.3	1650.0	370.7	355.4
1957	1112.9	142.3	2600.0	270.3	283.3
1958	768.6	122.9	3450.0	214.1	262.7
1959	1217.1	162.8	2750.0	301.8	313.0
1960	1254.3	197.6	3100.0	337.9	309.5
1961	1041.4	200.4	4100.0	317.6	294.0
1962	1271.4	217.0	4800.0	363.0	327.9
1963	1234.3	201.2	3950.0	341.6	316.5
1964	1498.6	242.1	5000.0	413.4	372.4

Table D.

Percentage Importance of Components of the Value of Production in Copper Mining

	1 Col. 2 of Table B Col. 3 of Table B	2 Col. 4 of Table B Col. 1 of Table B	3 Col. 6 of Table B Col. 1 of Table B	4 Col. 7 of Table B Col. 1 of Table B	5 Col. 2 of Table B Col. 1 of Table B
	Value of Invest. % of Yearly Profits	Amortization as % of Value of Production	Taxes paid in Chile as % of value of Product	Legal cost of Production as % of value of Product	Value of Invest. Value of Product
1930	28.0	9.2	5.6	39.4	8.3
1931	33.3	13.2	1.8	50.3	2.1
1932	-12.8	22.0	3.2	40.1	5.2
1933	-5.7	16.0	3.5	31.0	4.4
1934	9.4	12.5	4.5	29.5	1.8
1935	(24.3)	11.1	3.2	21.5	-
1936	3.8	9.8	6.6	24.6	1.2
1937	3.9	5.5	11.1	17.9	1.9
1938	4.4	7.0	7.2	25.9	1.6
1939	6.1	6.6	11.5	26.1	1.8
1940	4.1	6.0	14.0	24.5	1.4
1941	20.8	3.6	17.2	25.4	6.5
1942	3.3	5.2	19.4	29.1	.9
1943	4.8	4.8	19.5	37.5	1.1
1944	7.8	3.5	18.7	36.6	1.6
1945	6.8	3.6	17.0	40.4	1.2
1946	7.0	5.1	16.0	38.7	1.4
1947	5.8	3.5	20.2	31.9	1.3
1948	13.5	2.7	22.6	32.7	3.1
1949	84.3	3.0	16.8	42.1	14.4
1950	81.7	2.7	25.0	38.1	14.7
1951	98.8	2.2	24.0	35.8	19.8
1952	87.0	2.7	21.1	37.6	15.5
1953	207.6	2.4	15.3	67.0	17.7
1954	1.5	1.2	13.9	31.9	.1
1955	4.2	0.8	40.4	19.2	.8
1956	35.2	2.5	40.7	20.5	8.0
1957	122.1	4.8	29.3	26.5	17.7
1958	199.3	5.5	22.8	25.8	23.5
1959	70.0	6.5	27.1	25.5	12.4
1960	33.6	7.7	26.3	29.2	4.8
1961	48.6	4.9	24.2	32.9	5.7
1962	33.4	6.6	27.5	33.1	4.5
1963	47.6	8.4	26.4	30.4	5.7
1964	33.1	7.3	29.0	33.0	4.4



Table D.

Percentage Importance of Components of the Value of Production in Copper Mining

	6	7	8	9	10
	Col. 3 of Table B	Col. 5 of Table B	Col. 8 of Table B	Col. 9 of Table B	Col. 10 of Table B
	Col. 1 of Table B	Col. 1 of Table B	Col. 1 of Table B	Col. 1 of Table B	Col. 1 of Table B
	Yearly Profits Value of Product	Expendi- ture Out- side Chile Value of Product	Misc. Local payments Value of Product	Net Foreign Exchange (Taxes paid in Chile, Legal cost of Production, & Misc. Local Payments	Net Foreign Exchange (Value of Invest. & Taxes Paid in Chile, Legal Cost of Produc- tion & Misc. Local Payments
1930	29.7	5.1	0.02	45.1	53.5
1931	6.2	7.0	.0	52.0	54.2
1932	-41.3	6.5	.0	43.0	48.4
1933	-4.0	7.6	.0	34.7	35.1
1934	19.3	7.7	.0	33.9	35.7
1935	23.1	7.6	.0	25.3	24.9
1936	30.9	6.9	.0	31.3	32.5
1937	48.2	4.8	.0	28.9	30.9
1938	36.3	5.7	0.01	33.1	24.7
1939	29.8	6.1	0.01	37.6	39.5
1940	34.7	6.3	0.01	38.5	39.9
1941	31.3	2.1	0.01	42.7	49.2
1942	27.6	1.0	0.1	51.3	52.2
1943	23.2	1.0	0.1	57.7	58.9
1944	20.8	1.1	0.1	56.1	57.7
1945	17.6	1.7	0.1	58.3	59.5
1946	19.7	1.8	0.1	55.5	56.9
1947	22.0	3.6	0.1	56.1	57.4
1948	22.6	3.9	0.1	56.1	59.1
1949	17.1	4.1	1.0	59.9	74.3
1950	17.9	4.3	1.1	64.2	78.8
1951	19.9	3.6	4.1	63.9	83.6
1952	17.7	3.1	28.8	87.9	103.3
1953	8.5	6.4	48.2	129.3	147.0
1954	8.6	3.7	19.7	65.2	65.3
1955	18.2	5.0	13.4	73.2	74.0
1956	22.8	6.1	1.0	60.7	68.7
1957	14.4	10.7	1.9	53.9	71.5
1958	11.7	11.0	2.9	51.5	74.7
1959	17.7	9.9	1.7	54.3	66.7
1960	14.3	10.7	1.9	57.4	62.0
1961	11.8	11.0	2.7	63.7	65.5
1962	13.4	10.8	3.0	59.8	68.1
1963	12.0	10.6	2.4	59.2	64.9
1964	13.2	10.7	2.8	64.6	68.9

Table E

**Production Account of Foreign-Owned Copper Enterprises**  
(in thousands of U.S.\$)

Production Expenditures	1950	1951	1952	1953	1954	1955
1. Purchases of intermediate goods and services	64,806	62,835	90,740	76,544	57,785	53,171
1.1 Purchases in the country (1)	38,658	23,191	52,568	42,283	27,217	20,167
1.2 Foreign purchases (2)	16,800	28,300	26,800	20,900	14,700	21,500
1.3 Foreign expenditures (4)	9,438	11,344	11,372	13,371	15,868	11,504
2. Remuneration to wage earners	17,042	21,109	16,732	27,417	33,383	28,933
2.1 Wages (3)	9,806	11,991	10,234	15,823	14,416	14,051
2.2 Salaries (3)	4,606	5,496	3,930	7,362	11,965	9,832
2.3 Contributions to Social Security System (3)	617	786	601	1,331	2,336	2,430
2.4 Contributions of Private Employee Security Fund (3)	2,013	2,836	1,967	2,901	4,666	2,620
3. Interests (5)	-	-	-	5,600	4,500	13,000
4. Indirect Taxes	4,000	4,300	5,100	5,400	2,800	1,600
4.1 Custom duties (5)	4,500	4,300	5,300	8,300	9,400	10,400
5. Allowances for the consumption of fixed capital	82,269	122,466	160,433	97,044	112,036	240,381
5.1 Depreciation (6)	172,617	215,010	278,305	220,315	219,904	347,485
6. Resource Surplus (7)						
Total Costs of Production						
Value of Production						
7. Sales of goods or services	172,617	215,010	278,305	220,315	219,904	347,485
7.1 Gross exports of Copper (11)	163,600	182,900	258,000	185,900	226,300	325,300
7.11 Net foreign sales (8)	155,700	169,400	184,600	119,500	169,500	264,600
7.12 Increase of foreign stocks (5)	-	-	-	-	-	-
7.13 Surplus that benefits the government (5)	-	3,700	63,800	54,800	42,400	41,100
7.14 Foreign expenditures once the value of exported gold and silver has been deducted (5)	7,900	9,800	9,600	11,600	14,400	9,700
7.2 Exports of Molybdenum (10)	2,679	2,566	2,933	2,444	2,636	3,481
7.3 Exports of the gold and silver included in the blister copper (9)	1,538	1,544	1,772	1,771	1,468	1,804
7.4 Local sales (5)	8,500	25,900	14,100	12,500	16,000	22,300
7.5 Increase in local stocks (5)	-3,700	2,100	1,500	17,700	-26,500	-5,400
Total Value of Production	172,617	215,010	278,305	220,315	219,904	347,485

Table E

Production Account of Foreign-Owned Copper Enterprises  
(in thousands of U.S.\$)

Production Expenditures	1956	1957	1958	1959	1960
1. Purchases of intermediate goods and services					
1.1 Purchases in the country (1)	89,478	106,942	89,842	126,135	135,025
1.2 Foreign purchases (2)	48,549	50,988	35,606	57,450	69,771
1.3 Foreign expenditures (4)	26,300	34,900	30,500	36,300	31,300
2. Remuneration to wage earners	14,629	21,054	27,736	32,385	33,954
2.1 Wages (3)	27,251	29,812	33,094	36,550	42,929
2.2 Salaries (3)	13,416	13,789	16,158	16,373	20,250
2.3 Contributions to Social Security System (3)	8,744	10,368	10,765	13,177	14,586
2.4 Contributions of Private Employee Security Fund (3)	2,160	2,234	2,618	2,652	3,280
3. Interests (5)	2,931	3,421	3,553	4,348	4,813
4. Indirect Taxes	5,800	2,300	1,400	2,500	2,600
4.1 Custom duties (5)	-	-	-	-	-
5. Allowances for the consumption of fixed capital					
5.1 Depreciation (6)	13,500	16,600	17,200	24,400	26,400
6. Resource Surplus (7)	220,529	116,492	83,726	149,341	143,234
Total Costs of Production	356,558	272,146	225,262	338,926	350,188
Value of Production					
7. Sales of goods or services					
7.1 Gross exports of Copper (11)	356,558	272,146	225,262	338,926	350,188
7.11 Net foreign sales (8)	332,700	255,300	206,400	297,100	322,000
7.12 Increase of foreign stocks (5)	311,200	235,800	177,800	260,300	288,700
7.13 Surprice that benefits the government (5)	9,100	500	6,900	6,800	1,500
7.14 Foreign expenditures once the value of exported gold and silver has been deduced (5)	-	-	-	-	-
7.2 Exports of Molibdinum (10)	12,400	19,000	21,700	30,000	31,800
7.3 Exports of the gold and silver included in the blister copper (9)	3,229	3,792	2,426	6,041	6,434
7.4 Local sales (5)	2,229	2,054	2,036	2,385	2,154
7.5 Increase in local stocks (5)	11,000	4,100	15,600	25,600	8,200
Total Value of Production	7,400	6,900	-1,200	7,800	11,400
	356,558	272,146	225,262	338,926	350,188

Table E.  
(continued)

Production Account of Foreign-Owned Copper Enterprises

NOTES: (1) This figure was obtained by deducting from the "legal cost of production" and "various" published in the Balance of Payments, the wages and salaries paid by the companies.

(2) Item obtained from the Balance of Payments where it appears under the denomination "imports with own foreign exchange".

(3) Wages were obtained by converting into dollars at the banks exchange rate the product of the average wage in escudos, and the blue-collar employment as indicated in the Anuarios de Minería del Servicio de Minas del Estado. Salaries were calculated as the difference between the total of wages and salaries published in aforementioned Anuarios, and the wages. Contributions to the Social Security System were estimated by applying the respective rates to the wage and salary figures.

(4) This figure was obtained as the sum of the expenditures abroad resulting from refining, transportation, insurance and so forth, which are taken into account in the Balance of Payments, and those expenditures which are not registered and accounted for in the Balance of Payments because they correspond, according to the Central Bank, to exports of gold and silver contained in blister copper which are also not registered.

(5) Data obtained from the Balance of Payments.

(6) The depreciation reported in the balance of payments is considered as equivalent to the depreciation in replacement value.

(7) Difference between the value of production and total production expenditures.

(8) Sales abroad after deducting transport, refining, and insurance expenditures according to Balance of Payments information.

(9) This data is included, since it is official, in the present table even though they curiously imply a gold and silver content in blister of foreign-owned mining which is very much lower to that of national mining.

(10) Detailed information is obtained from the Central Bank Bulletins.

(11) Sum of items 7.11, 7.12, 7.13 and 7.14.

SOURCE: CORFO Dirección de Planificación, Departamento de Investigaciones Economicas, Cuenta de Producción de las Empresas Extranjeras Dedicados a la Explotación de Cobre. Cuenta de dólares, Grupo 122 (Santiago, Chile: CORFO, 1964) Pp. 1-2. Mimeo.

Table F

Value of Components as Percentages of Total Value of Production, 1950-1960.

	1950	1951	1952	1953	1954	1955	1956
1. Purchases of Intermediate Goods and Services	37.5	29.2	32.6	34.7	26.3	15.3	25.1
1.1 Purchases in Country	22.4	10.8	18.9	19.2	12.4	5.8	13.6
1.2 Foreign Purchases	9.7	13.2	9.6	9.5	6.7	6.2	7.4
1.3 Foreign Expenditures	5.5	5.3	4.1	6.1	7.2	3.3	4.1
2. Renumeration of Wage Earners	9.9	9.8	6.0	12.4	15.2	8.3	7.6
2.1 Wages	5.7	5.6	3.7	7.2	6.6	4.0	3.8
2.2 Salaries	2.7	2.6	1.4	3.3	5.4	2.8	2.5
2.3 Contribution to Social Security System (SSS)	0.4	0.4	0.2	0.6	1.1	0.7	0.6
2.4 Contributions of Private Employees to SSS	1.2	1.3	0.7	1.3	2.1	0.8	0.8
3. Interests	-	-	-	2.5	2.0	3.7	1.6
4. Indirect Taxes							
4.1 Custom Duties	2.3	2.0	1.8	2.5	1.3	0.5	-
5. Allowances for Consumption of fixed Capital				1.2	1.2	0.7	2.4
5.1 Depreciation	2.6	2.0	1.9	3.8	4.3	3.0	3.8
6. Resource Surplus	47.7	57.0	57.6	44.0	51.0	69.2	61.8

Table F  
(continued)

Value of Components as Percentages of Total Value of Production, 1950-1960.

	1957	1958	1959	1960	Total	Average
1. Purchases of Intermediate Goods and Services	39.3	39.9	37.2	38.6	355.7	32.3
1.1 Purchases in Country	18.7	15.8	17.0	19.9	174.5	15.9
1.2 Foreign Purchases	12.8	13.5	10.7	8.9	108.2	9.8
1.3 Foreign Expenditures	7.7	12.3	9.6	9.7	74.9	6.8
2. Remuneration of Wage Earners	11.0	14.7	10.6	12.3	118.0	10.7
2.1 Wages	5.1	7.2	4.8	5.8	59.5	5.4
2.2 Salaries	3.8	4.8	3.9	4.2	37.4	3.4
2.3 Contribution to Social Security System (SSS)	0.8	1.2	0.8	0.9	7.7	0.7
2.4 Contributions of Private Employees to SSS	1.3	1.6	1.3	1.4	13.8	1.3
3. Interests	0.8	0.6	0.7	0.7	12.6	1.1
4. Indirect Taxes						
4.1 Custom Duties	-	-	-	-	10.4	0.9
5. Allowances for Consumption of fixed Capital	4.6	5.6	6.0	7.4	29.1	2.6
5.1 Depreciation	6.1	7.6	7.2	7.5	49.8	4.5
6. Resource Surplus	42.8	37.2	44.1	40.8	553.2	50.3

Table G

Balance of Payments Effect, 1952-1964.  
(In thousands of U.S. dollars)

Year	$(\Sigma Sf + \Sigma If)$	-	$(\pi + i + k)$	=		Index 61 = 100
1952	218,663	-	40,681	=	177,982	68.21
1953	121,875	-	12,396	=	109,479	41.96
1954	205,705	-	21,876	=	183,829	70.46
1955	284,795	-	57,318	=	227,477	87.19
1956	343,011	-	84,122	=	258,889	99.23
1957	303,318	-	50,461	=	252,857	96.92
1958	270,783	-	39,927	=	230,858	88.48
1959	329,489	-	76,437	=	253,052	96.99
1960	342,554	-	73,735	=	268,819	103.04
1961	310,939	-	50,052	=	260,887	100.00
1962	330,869	-	65,020	=	265,849	101.90
1963	335,947	-	66,655	=	269,292	103.22
1964	334,065	-	74,809	=	259,256	99.37

NOTE: Sf, stands for foreign sales, and If,  $\pi$ , i, and k, for foreign investment, profits, interest payments and capital amortization respectively.

Table H

Taxes on Copper Enterprises.  
(in millions of pesos)

Year	Total		Income Tax		Tax on Profits		Surplus on copper sales		Difference from sales of Foreign Exchange			
			Total	Income Tax	Extra-ordinary Tax L7160 8,758 and 11,137	Law 11.828	Law 7.144 and 8.283	Law 8.406 and 8.524	Total	Law 7.144 and 8.283	Law 8.406 and 8.524	Law 6.159
1925	8.3	8.3	8.3	8.3	-	-	-	-	-	-	-	-
1926	12.6	12.6	12.6	12.6	-	-	-	-	-	-	-	-
1927	26.0	26.0	26.0	26.0	-	-	-	-	-	-	-	-
1928	28.0	28.0	28.0	28.0	-	-	-	-	-	-	-	-
1929	49.0	49.0	49.0	49.0	-	-	-	-	-	-	-	-
1930	53.1	53.1	53.1	53.1	-	-	-	-	-	-	-	-
1931	21.6	21.6	21.6	21.6	-	-	-	-	-	-	-	-
1932	4.3	4.3	4.3	4.3	-	-	-	-	-	-	-	-
1933	0.6	0.6	0.6	0.6	-	-	-	-	-	-	-	-
1934	25.6	25.6	25.6	25.6	-	-	-	-	-	-	-	-
1935	35.5	35.5	35.5	35.5	-	-	-	-	-	-	-	-
1936	60.5	60.5	60.5	60.5	-	-	-	-	-	-	-	-
1937	79.7	79.7	79.7	79.7	-	-	-	-	-	-	-	-
1938	287.2	287.2	287.2	287.2	-	-	-	-	-	-	-	-
1939	465.8	465.8	465.8	341.0	-	-	-	-	124.8	-	-	124.8
1940	424.1	424.1	264.9	264.9	-	-	-	-	159.2	-	-	159.2
1941	564.3	564.3	368.4	368.4	-	-	-	-	195.9	-	-	195.9
1942	518.5	518.5	490.1	401.6	88.5	-	-	-	28.4	-	-	28.4
1943	1,494.3	1,494.3	731.3	331.2	400.1	-	-	-	363.0	363.0	-	-
1944	1,049.4	1,049.4	647.4	253.8	393.6	-	-	-	402.0	402.0	-	-
1945	1,286.3	1,286.3	647.6	245.5	402.1	-	-	-	638.7	409.1	229.6	-
1946	950.9	950.9	534.8	173.4	361.4	-	-	-	416.1	297.9	118.2	-



Table H

Year	Total	Taxes on Copper Enterprises. (in millions of pesos)				Difference from sales of Foreign Exchange			
		Income Tax	Extra-ordinary Tax L7160	Tax on Profits	Surprice on copper sales	Income Tax	Extra-ordinary Tax L7160	Tax on Profits	Surprice on copper sales
1947	2,160.0	87.5	1,366.3	-	-	706.2	303.5	402.7	-
1948	4,108.4	30.3	1,595.7	-	-	2,482.4	1,937.3	545.1	-
1949	2,114.3	13.9	1,016.7	-	-	1,083.7	746.4	337.3	-
1950	2,019.3	5.2	873.4	-	-	1,140.7	643.3	497.4	-
1951	3,664.4	6.4	1,304.8	-	-	2,353.2	1,135.7	1,217.5	-
1952	6,287.8	9.6	1,200.8	-	-	2,980.5	1,077.1	1,903.4	-
1953	4,644.9	7.9	530.4	-	-	2,763.4	1,341.2	1,422.2	-
1954	10,410.8	12.9	3,161.5	-	-	3,358.6	2,067.9	1,290.7	-
1955	23,085.2	10.1	2,941.7	-	-	2,050.6	1,661.0	-	-
1956	52,067.6	-	782.8	14,143.7	1.8	14,155.9	12,965.4	-	1,190.5
1957	46,378.8	-	346.8	37,127.1	-	3,055.7	2,749.2	-	306.5

SOURCE: Chile, Ministerio de Hacienda, Departamento de Estudios Financieros, Cuentas Fiscales de Chile 1925-1957 (Santiago, Talleres Gráficos "La Nación", S.A., 1959)  
p. 37 Table 30 for 1925 to 1957.

Table I

Taxes Levied on Copper. (In millions of Chilean pesos, current prices)					
	1940	1941	1942	1943	1944
1. Extraordinary Tax on Copper L. 7160	-	-	88,530	400,110	393,600
Taxes L. 8798	-	-	-	-	-
Surcharge 20% L. 11137	-	-	-	-	-
Total extraordinary tax	-	-	88,530	400,110	393,600
2-4a Category:					
2% L 6334 (CORFO)	19,560	22,790	24,330	20,100	15,420
10% L 6334	340	113,910	121,680	99,750	76,350
12% L 5580 (Caja Amort.)	156,400	131,700	146,010	120,660	92,690
Total tax. 4th Cat.	176,800	268,380	292,920	240,510	184,260
3. Additional:					
3% L 6334	29,310	34,170	36,510	30,210	23,160
6% L 5590	58,650	65,820	73,050	60,390	46,290
Additional Total	87,960	99,990	109,560	90,600	69,450
4. Other Taxes					
Res. 20% L 8918, 8938 and 9311	-	-	-	-	-
Surprice L. 10. 003	-	-	-	-	-
Surprice on copper sales L 10. 255	-	-	-	-	-
Total	264,760	368,370	490,110	731,220	647,310
Revenues due to difference from foreign exchange sales	-	-	62,342	130,801	321,965
					797,351

Table I  
(continued)

Taxes Levied on Copper. (In millions of Chilean pesos, current prices)					
	1946	1947	1948	1949	1950
1. Extraordinary Tax on Copper L. 7160	361, 367	442, 556	347, 665	260, 400	285, 052
Taxes L. 8798	-	790, 438	1, 244, 567	756, 307	588, 342
Surcharge 20% L. 11137	-	-	-	-	-
Total extraordinary tax	361, 367	1, 232, 494	1, 592, 222	1, 016, 707	873, 394
2-4 <sup>a</sup> Category:					
2% L 6334 (CORFO)	10, 509	5, 301	-	-	-
10% L 6334	52, 514	26, 474	-	-	-
12% L 5580 (Caja Amort.)	63, 023	31, 775	-	-	-
Total tax. 4th Cat.	126, 046	63, 550	12, 121	11, 123	5, 250
3. Additional:					
3% L 6334	15, 779	7, 967	-	-	-
6% L 5590	31, 558	15, 903	-	-	-
Additional Total	47, 337	23, 870	6, 386	-	-
4. Other Taxes					
Res. 20% L 8918, 8938 and 9311		133, 362	3, 472	-	-
Surprice L. 10. 003		-	-	-	-
Surprice on copper sales L 10. 255		-	-	-	-
Total	534, 750	1, 453, 776	1, 614, 201	1, 027, 830	878, 644
Revenues due to difference from foreign exchange sales	638, 242	754, 534	1, 264, 625	1, 190, 521	1, 140, 760

Table I  
(continued)

Taxes Levied on Copper. (In millions of Chilean pesos, current prices)			
	1951	1952	1953
1. Extraordinary Tax on Copper L. 7160	130,665	42,237	-
Taxes L. 8798	1,174,196	1,158,547	326,614
Surcharge 20% L. 11137	-	-	203,754
Total extraordinary tax	1,304,821	1,200,784	530,368
2-4 <sup>a</sup> Category:			
2% L 6334 (CORFO)	-	-	-
10% L 6334	-	-	-
12% L 5580 (Caja Amort.)	-	-	-
Total tax. 4th Cat.	5,316	9,605	7,901
3. Additional:			
3% L 6334	-	-	-
6% L 5590	-	-	-
Additional Total	-	-	-
4. Other Taxes			
Res. 20% L 8918, 8938 and 9311	-	-	-
Surprice L. 10.003	-	500,674	-
Surprice on copper sales L 10.255	-	1,596,312	1,343,193
Total	1,311,137	3,307,375	1,881,462
Revenues due to difference from foreign exchange sales	2,728,258	2,990,867	2,763,474 <sup>(2)</sup>

SOURCE: (1) The figures covering the period between 1940 and 1948 have been obtained from the Internal Revenue Office (Impuestos Internos). Since 1949, the series were obtained from Internal Revenue and the Controller's Office (Contraloría).

(2) These figures correspond to the legal costs of copper, nitrate and iron.

Table J  
Income Taxes of the Copper Firms.  
(in millions of pesos)

Year	Total	CORFOS' Share	Fourth Category				Additional	
			Total	2% L/6.334 (Corfo)	10% L/6.334 (Corfo)	12% L/5.580 Amortization Bank	Total	3% L/6.334 6% L/5.580 Amortization Bank
1925	8.3	-	-	-	-	-	-	-
1926	12.6	-	-	-	-	-	-	-
1927	26.0	-	-	-	-	-	-	-
1928	28.0	-	-	-	-	-	-	-
1929	49.0	-	-	-	-	-	-	-
1930	53.1	-	-	-	-	-	-	-
1931	21.5	-	-	-	-	-	-	-
1932	4.3	-	-	-	-	-	-	-
1933	0.6	-	-	-	-	-	-	-
1934	25.6	-	-	-	-	-	-	-
1935	35.5	-	-	-	-	-	-	-
1936	60.5	-	-	-	-	-	-	-
1937	79.7	-	-	-	-	-	-	-
1938	287.2	-	-	-	-	-	-	-
1939	341.0	-	248.5	20.1	100.5	127.8	92.5	30.2
1940	264.9	-	176.9	19.7	0.8	156.4	88.0	29.3
1941	368.4	-	268.4	22.8	113.9	131.7	100.0	34.2
1942	401.6	-	292.0	24.3	121.7	146.0	109.6	36.5
1943	331.2	-	240.6	20.1	99.8	120.7	90.6	30.2
1944	253.8	-	184.3	15.4	76.4	92.5	69.5	23.2
1945	245.5	-	178.1	14.9	73.9	89.5	67.2	22.4
1946	173.4	-	126.1	10.5	52.5	63.0	47.4	15.8
1947	87.5	-	63.6	5.3	26.5	31.8	23.9	8.0
1948	30.3	10.9	12.1	-	-	-	7.3	2.9
1949	13.9	4.3	5.7	-	-	-	3.9	-
1950	5.2	2.1	2.6	-	-	-	0.5	-

Table J  
(continued)  
Income Taxes of the Copper Firms.  
(in millions of pesos)

Year	Total	CORFOS' Share	Fourth Category				Additional	
			Total	2% L/6.334 (Corfo)	10% L/6.334 (Corfo)	12% L/5.580 Amortization Bank	Total	3% L/6.334 Amortization Bank
1951	6.4	1.4	2.9	-	-	-	2.1	-
1952	9.6	4.0	5.6	-	-	-	-	-
1953	7.9	2.6	5.3	-	-	-	-	-
1954	12.9	11.3	1.6	-	-	-	-	-
1955	10.1	6.9	3.2	-	-	-	-	-

SOURCE: Republica de Chile, Ministerio de Hacienda, Departamento de Estudios Financieros,  
Cuentas Fiscales de Chile (1925-1957) (Santiago, Talleres Grafico "La Nacion", S.A., 1959)  
P. 37 Table No. 31 for 1925 to 1955.

Table K

Types of Taxes Paid by the Gran Minería.  
(In thousands of U.S. \$)

	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952
<u>I. Copper Tax</u>											
					A. Copper Taxes						
Extraordinary Tax	2.951	13.337	13.120	13.404	11.657	14.276	11.215	8.400	1.882	4.215	757
Law 8756						25.498	40.147	24.397	26.292	37.870	37.998
Law 2919, etc.						4.302	112				
Total	2.951	13.337	13.120	13.404	11.657	44.076	51.474	32.797	28.174	42.091	38.735
<u>Income Tax</u>											
a) 4 <sup>a</sup> Category											
2% L. 6334	811	670	514	497	339	171					
10% L. 6334	4.056	3.325	2.545	2.463	1.694	854					
12% L. 5580	4.867	4.022	5.083	2.984	2.033	1.025					
Total	9.734	8.017	8.142	5.844	4.066	2.050	391				
b) Additional											
3% L. 6334	1.217	1.007	772	747	509	257					
6% L. 5880	2.435	2.013	1.543	1.494	1.018	513					
Total	3.652	3.020	2.315	2.241	1.527	770	203				
<u>Surprises</u>											
L 10.005										3.699	18.969
L 10.255											63.834
TOTAL											
a) Segun Impuestos Internos	16.337	24.374	21.577	21.589	17.250	46.896	52.071	32.798	28.175	45.790	121.558
a) Segun Banco Central	17.411	25.381	22.815	22.832	19.115	49.869	44.267	27.258	32.350	51.602	129.082
Legal Cost	34.900	43.800	44.730	43.150	42.425	49.875	82.400	54.255	55.700	44.295	53.358
1) Total Copper Tax:	52.311	69.181	67.543	65.962	61.540	99.744	106.667	81.505	88.053	95.897	182.440

Table K  
(continued)

Types of Taxes Paid by the Gran Minería.  
(In thousands of U.S. \$)

	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952
<b>B. Nitrate Taxes</b>											
Governments' share	2.792	2.637	2.030	2.852	3.641	2.483	4.884	4.287	5.133	4.921	3.746
Legal Cost	15.267	14.126	14.546	22.795	31.571	31.631	35.079	36.190	37.712	32.000	47.392
TOTAL	18.059	16.762	16.676	25.647	35.212	35.114	39.983	40.477	42.840	36.921	51.138
<b>C. Iron Taxes</b>											
Taxes	469	28	45	48	42	635	886	1.108	723	1.240	3.377
Legal Cost	483	240	350	350	869	1.440	1.975	2.574	2.170	2.325	1.568
TOTAL	952	268	395	398	911	2.075	2.861	3.682	2.893	3.565	4.945
Total Taxes Paid by the Gran Minería (A + P + C)	71.326	86.211	84.614	92.007	97.665	136.953	149.491	125.662	133.805	136.383	238.523

1) In accordance to the Central Bank. Letter b) of Total Tax was added with legal cost of production.

SOURCE: Chile, Ministerio de Hacienda, Informe del Departamento de Estudios Financieros sobre La Experiencia Fiscal Chilena. Periodo 1940-1953 (Santiago, Editorial Universitaria S.A., 1954) pp. 39 and 40.



Table II

Differences between the Companies Exchange Rate  
and the New Dollar Price Series.  
(in pesos)

Year	New Dollar Price	Chilex Rate	Differ- ence A	Andes Rate	Differ- ence B
1928	8.00	8.23	-0.23	8.32	-0.32
1929	8.12	8.26	-0.14	8.26	-0.14
1930	8.02	8.26	-0.24	8.26	-0.24
1931	7.96	8.29	-0.33	8.27	-0.31
1932	8.48	12.39	-3.91	12.39	-3.91
1933	10.51	16.55	-6.04	16.55	-6.04
1934	10.52	16.55	-6.03	16.55	-6.03
1935	10.73	16.55	-5.82	16.55	-5.82
1936	11.63	19.46	-7.83	19.37	-7.74
1937	13.09	19.37	-6.28	19.37	-6.28
1938	13.25	19.37	-6.12	19.37	-6.12
1939	13.42	19.37	-5.95	19.37	-5.95
1940	15.12	19.37	-4.25	19.37	-4.25
1941	17.40	19.37	-1.97	19.37	-1.97
1942	21.85	19.37	2.48	19.37	2.48
1943	25.38	19.37	6.01	19.37	6.01
1944	28.34	19.37	8.97	19.37	8.97
1945	30.83	19.37	11.46	19.37	11.46
1946	35.70	19.37	16.33	19.37	16.33
1947	47.70	19.37	28.33	19.37	28.33
1948	56.23	19.37	36.86	19.37	36.86
1949	66.74	19.37	47.37	19.37	47.37
1950	76.81	19.37	57.44	19.37	57.44
1951	93.86	19.37	74.49	19.37	74.49
1952	114.60	19.37	95.23	19.37	95.23
1953	143.60	66.18	77.42	66.18	77.42
1954	247.56	64.68	182.88	64.68	182.88
1955	433.47	109.79	323.68	109.79	323.68
1956	675.77	173.12	502.65	254.84	420.93
1957	899.42	365.82	533.60	367.47	531.95
1958	1,079.30	611.02	468.28	613.16	466.14
1959	1,493.90	788.35	705.55	775.66	718.24
1960	1,667.20	1,045.42	621.78	1,045.42	621.78
1961	1,795.57	1,049.00	746.57	1,049.00	746.57
1962	2,046.94	1,049.00	997.94	1,049.00	997.94
1963	2,953.73	1,224.50	1,729.23	1,224.50	1,729.23
1964	4,312.44	1,775.00	2,537.44	1,775.00	2,537.44

Table M  
(continued)

Differences between the Companies Exchange Rate  
and the New Dollar Price Series.  
(in pesos)

Year	<u>Difference A</u> Parity Rate	<u>Difference A</u> Chilex Rate	<u>Difference B</u> Parity Rate	<u>Difference B</u> Andes Rate
1928	2.87%	2.79%	4.00%	3.84%
1929	1.72%	1.69%	1.72%	1.69%
1930	2.99%	2.90%	2.99%	2.90%
1931	4.14%	3.98%	3.89%	3.74%
1932	46.10%	31.55%	46.10%	31.55%
1933	57.46%	36.49%	57.46%	36.49%
1934	57.31%	36.43%	57.31%	36.43%
1935	54.24%	35.16%	54.24%	35.16%
1936	67.32%	40.23%	66.55%	39.95%
1937	47.97%	32.42%	47.97%	32.42%
1938	46.18%	31.59%	46.18%	31.59%
1939	44.33%	30.71%	44.33%	30.71%
1940	28.10%	21.94%	28.10%	21.94%
1941	11.32%	10.17%	11.32%	10.17%
1942	11.35%	12.80%	11.35%	12.80%
1943	23.68%	31.02%	23.68%	31.02%
1944	31.65%	46.30%	31.65%	46.30%
1945	37.17%	59.16%	37.17%	59.16%
1946	45.74%	84.30%	45.74%	84.30%
1947	59.39%	146.25%	59.39%	146.25%
1948	65.55%	200.61%	65.55%	200.61%
1949	70.97%	244.55%	70.97%	244.55%
1950	74.78%	296.54%	74.78%	296.54%
1951	79.36%	384.56%	79.36%	384.56%
1952	83.09%	491.63%	83.09%	491.63%
1953	53.91%	116.98%	53.91%	116.98%
1954	73.87%	282.74%	73.87%	282.74%
1955	74.67%	294.81%	74.67%	294.81%
1956	74.38%	290.34%	62.28%	165.17%
1957	59.32%	145.86%	59.14%	144.76%
1958	43.38%	76.63%	43.18%	76.02%
1959	47.22%	89.49%	48.07%	92.59%
1960	37.29%	59.47%	37.29%	59.47%
1961	41.57%	71.16%	41.57%	71.16%
1962	48.75%	95.13%	48.75%	95.13%
1963	58.54%	141.21%	58.54%	141.21%
1964	58.84%	142.95%	58.84%	142.95%

Table M  
(continued)

Difference between the Companies Exchange Rate  
and the New Dollar Price Series.  
(in pesos)

SOURCE: The New Dollar price or, parity rate was calculated with the formula:  $P_t = P_{t-1} + P_{t-1} \times \text{percentage variation between yearly averages of the cost-of-living index}$ . The Chilex and Andes Rates are the foreign exchange rates at which the respective companies could convert dollars into pesos and have been obtained from the Companies. Two additional parity exchange rates taking into account both Chilean and American price changes at the retail and wholesale level have also been calculated and the series obtained have values substantially below the new dollar price reported here. I still prefer to use the "new dollar price" of the present table since there exists ample evidence that Chilean inflation is not fully recorded in the price indices.

Table N

Year	Dollar Price	Index (1961=100)	New Dollar Price	Difference A Corfo's Dollar Rate	Difference B Corfo's Dollar Rate
1928	8	0.3	8.00	2.87%	4.00%
1929	8	0.3	8.12	1.75%	1.75%
1930	8	0.3	8.02	3.00%	3.00%
1931	8	0.3	7.96	4.12%	3.87%
1932	14	1.3	8.48	27.92%	27.92%
1933	32	3.1	10.51	18.87%	18.87%
1934	32	3.1	10.52	18.84%	18.84%
1935	24	2.3	10.73	24.25%	24.25%
1936	24	2.3	11.63	32.62%	32.25%
1937	25	2.4	13.09	25.12%	25.12%
1938	25	2.4	13.25	24.48%	24.48%
1939	25	2.4	13.42	23.80%	23.80%
1940	25	2.4	15.12	17.00%	17.00%
1941	30	2.9	17.40	6.56%	6.56%
1942	30	2.9	21.85	8.26%	3.25%
1943	30	2.9	25.38	20.03%	20.03%
1944	30	2.9	28.34	29.90%	29.90%
1945	30	2.9	30.83	38.20%	38.20%
1946	30	2.9	35.70	54.43%	54.43%
1947	32	3.1	47.70	88.53%	83.53%
1948	36	3.4	56.23	102.38%	102.33%
1949	38	3.6	66.74	124.65%	124.65%
1950	51	4.9	76.81	112.62%	112.62%
1951	57	5.4	95.86	130.68%	130.68%
1952	66	6.3	114.60	144.23%	144.26%
1953	76	7.2	143.60	101.86%	101.86%
1954	104	9.9	247.56	175.84%	175.84%
1955	181	17.3	433.47	178.82%	178.82%
1956	351	33.5	675.77	143.20%	119.92%
1957	624	59.5	899.42	85.51%	85.24%
1958	715	68.2	1,079.30	65.49%	65.19%
1959	1,049	100.0	1,493.90	67.25%	68.46%
1960	1,049	100.0	1,667.20	59.27%	59.27%
1961	1,049	-	1,795.57	71.14%	71.14%
1962	1,153	-	2,046.94	86.55%	86.55%
1963	1,800	-	2,953.73	96.06%	96.06%
			4,312.44		

NOTE: The New Dollar Price column was calculated with the formula:  

$$P_t = P_{t-1} + P_{t-1} \cdot \% \text{ Variation between yearly averages of the Cost of Living Index.}$$

SOURCE: CORFO Dirección de Planificación Departamento de Investigaciones Económicas, División Comercio Exterior, Índice de Precio del Dólar.

Table C

Investment and Profits.  
(in thousands of U.S.\$)

	Andes		Braden	
	Investment	* Profits Investment	Investment	* Profits Investment
1930	1,911	393.2%	1,756	304.7%
1931	-	-	449	444.0%
1932	-	-	154	-
1933	-	-	76	2,411.8%
1934	-	-	650	720.3%
1935	2	30,950.0%	880	734.2%
1936	9	9,250.0%	537	1,242.2%
1937	121	4,461.9%	1,085	1,880.1%
1938	224	1,141.0%	-	-
1939	231	1,130.7%	835	982.7%
1940	188	2,257.4%	468	2,358.7%
1941	119	3,629.4%	138	7,642.7%
1942	279	993.5%	-	-
1943	262	1,045.0%	661	1,263.0%
1944	10	21,180.0%	570	1,460.5%
1945	2	20,350.0%	415	1,246.7%
1946	-	-	634	602.5%
1947	-	-	827	1,316.4%
1948	11	45,227.2%	1,054	1,827.3%
1949	203	732.5%	1,519	633.3%
1950	-	-	2,311	467.9%
1951	28	4,839.2%	1,048	1,625.0%
1952	3	70,200.0%	2,396	774.4%
1953	35	1,488.5%	2,559	174.8%
1954	48	858.3%	274	1,760.9%
1955	-	-	1,091	1,975.1%
1956	11,359	22.2%	3,398	705.2%
1957	28,706	-	3,548	532.7%
1958	41,717	-	2,189	702.1%
1959	22,399	0.2%	2,608	802.6%
1960	3,099	86.9%	2,940	807.8%
1961	1,726	34.8%	9,905	93.7%
1962	1,332	159.9%	4,790	210.6%
1963	4,440	81.6%	4,437	144.4%
1964	3,387	26.7%	5,282	243.8%
	121,864		61,506	

Table O  
(continued)

Investment and Profits.  
(in thousands of U. S. \$)

	Chilex Investment	* Profits Investment	Total Investment	Total Investment Total Profits	
1930	1, 271	588.1%	4, 939	354.5%	
1931	110	238.0%	600	293.5%	
1932	689	-	844	-	
1933	-	-	76	-	
1934	-	-	650	1, 004.6%	
1935	-	-	882	1, 203.1%	
1936	-	-	547	2, 356.8%	
1937	748	2, 996.5%	1, 954	2, 467.8%	(millions)
1938	938	1, 330.3%	1, 163	2, 315.1%	Total 12.9
1939	230	4, 619.5%	1, 297	1, 653.4%	Average 1.3
1940	499	2, 856.3%	1, 155	2, 556.4%	
1941	6, 347	264.2%	6, 605	479.0%	
1942	817	2, 332.4%	1, 096	2, 958.0%	
1943	405	3, 965.6%	1, 329	2, 042.8%	
1944	1, 447	1, 027.7%	2, 037	1, 249.2%	
1945	886	1, 497.4%	1, 303	1, 446.5%	
1946	906	1, 802.9%	1, 541	1, 404.5%	
1947	1, 166	1, 921.4%	1, 993	1, 755.6%	
1948	5, 588	440.3%	6, 653	734.1%	
1949	20, 640	74.4%	22, 363	118.4%	
1950	22, 446	75.9%	24, 757	122.0%	
1951	37, 715	54.8%	38, 792	101.1%	
1952	28, 520	51.6%	30, 921	114.4%	
1953	17, 583	26.8%	20, 179	48.1%	
1954	-	-	323	5, 923.5%	Total 160.9
1955	1, 217	2, 607.8%	2, 309	2, 374.8%	Average 10.7
1956	11, 933	412.9%	26, 690	283.8%	
1957	14, 077	134.6%	46, 332	81.8%	
1958	10, 275	116.2%	54, 181	50.2%	
1959	14, 086	247.7%	39, 095	142.9%	
1960	10, 080	211.8%	16, 119	296.5%	
1961	5, 571	458.3%	17, 203	205.8%	
1962	8, 461	369.1%	14, 584	297.9%	
1963	9, 807	298.3%	18, 685	210.3%	Total 251.1
1964	7, 207	476.0%	15, 877	302.9%	Average 25.1
	<u>241, 900</u>		<u>425, 271</u>		

\* Profits have been taken from Table A.

Table 0  
(continued)

Investment and Profits.  
(in thousands of U.S.\$)

NOTE: These figures are substantially different from the ones released to the author by El Departamento del Cobre. As a whole, these figures do not differ much, without being indetical, from the information presented by Clark Winton Reynolds, "Development Problems of an Export Economy. The Case of Chile and Copper". in Essays on the Chilean Economy, op. cit.

SOURCE: Chile, Senado de la Republica. Boletin No. 21.773, Informe de las Comisiones de Hacienda y Minería, Unidas, Recaido en el Proyecto de ley de la Honorable Comara de Diputados, que Establece Normas Sobre Producción, Manufactura y Comercio de Cobre. Parte Final. (Santiago, Chile: Instituto Geografico Militar, 1965) P. 48.

Table P

Copper Production of Foreign Owned Mines, by Type, 1950-1963.

<u>Year</u>	<u>Chile Exploration Co.</u>			<u>Andes Copper Co.</u>		<u>Braden Copper Co.</u>		
	<u>Electro- lytic</u>	<u>Blister</u>	<u>Total</u>	<u>Blister</u>	<u>Total</u>	<u>Fire- Refined</u>	<u>Blister</u>	<u>Total</u>
1950	155,820	-	155,820	45,937	45,937	143,248	-	143,248
1951	163,505	-	163,505	41,307	41,307	155,342	-	155,342
1952	151,196	8,059	159,255	47,035	47,035	167,655	-	167,655
1953	89,421	67,292	156,713	41,083	41,038	121,195	6,127	127,322
1954	109,852	75,992	185,844	38,530	38,530	67,563	30,448	98,011
1955	128,907	82,101	211,008	40,680	40,680	113,100	28,371	141,471
1956	140,051	101,664	241,715	39,356	39,356	100,372	62,401	162,773
1957	155,916	84,418	240,334	39,458	39,458	66,276	89,841	156,117
1958	128,302	84,757	213,059	32,805	32,805	58,006	113,663	171,669
1959	176,930	101,040	277,970	54,925	54,925	82,634	81,971	164,605
1960	146,939	84,135	231,074	79,191	79,191	78,565	90,651	169,216
1961	153,431	96,187	249,618	72,928	72,928	62,285	96,639	158,924
1962	180,034	95,705	275,739	82,841	82,841	66,367	85,579	151,946
1963	178,885	95,891	274,776	88,661	88,661	61,800	82,573	144,373



Table P  
(continued)  
Copper Production of Foreign Owned Mines, by Type, 1950-63.

<u>Year</u>	<u>Total Electrolytic and Fire- Refined</u>	<u>Total Blister</u>	<u>General Total</u>	<u>% Electrolytic and Fire- Refined</u>	<u>% Blister</u>
1950	299,068	45,937	345,005	87	13
1951	318,847	41,307	360,154	89	11
1952	318,851	55,094	373,945	85	15
1953	210,616	114,502	325,118	65	35
1954	177,415	144,970	322,385	55	45
1955	242,007	151,152	393,159	62	38
1956	240,423	203,421	443,844	54	46
1957	222,192	213,717	435,909	51	49
1958	186,308	231,225	417,533	45	55
1959	259,564	237,936	497,500	52	48
1960	225,504	253,977	479,481	47	53
1961	215,716	265,754	481,470	45	55
1962	246,401	264,125	510,526	48	52
1963	240,685	267,125	507,810	47	53

SOURCE: Ministerio de Minería, Servicio De Minas Del Estado,  
Anuario de la Minería de Chile, Año 1963, pp. 80-81.

