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EXPROPRIATION WITHOUT COMPENSATION:
COPPER IN CHILE, 1970-1973

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ABSTRACT

In this essay, I analyze the nationalization of large copper mines during Salvador Allende's socialist government in Chile in the 1970s. This is one of the earliest cases "nationalization without compensation." Chile's legal argument was based on the novel idea that "adequate" payment should be calculated as book value minus "excessive profits." In turn, excessive profits were defined, for every year, as profits above 12% of book value. I analyze the economic arguments that led to nationalization, and I deconstruct and critically evaluate the methodology used to calculate "excessive profits" and "adequate compensation." I analyze the US and multinationals' response to Chile's nationalization policies.

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1. Introduction

On September 4, 1970, Salvador Allende, a 62-year-old medical doctor and a Marxist, won a plurality in Chile's presidential election, with 36.6% of the vote. During the campaign he had pledged to nationalize American-owned companies, including large copper mines. He also promised to forge close diplomatic ties with the USSR, Cuba, North Vietnam, East Germany, and the other nations of the Warsaw Pact. The dominant parties in Allende's coalition, the *Unidad Popular*, were the pro-Cuban Socialist Party and the pro-Soviet Communist Party. Salvador Allende belonged to the former. Although he did not automatically become the president elect, he was confirmed as such by a joint session of Congress in late October 1970. Less than two weeks after the election, on September 15, President Richard Nixon met with CIA director Richard Helms, National Security Adviser Henry Kissinger, and Attorney General John Mitchell. It was decided to launch a plan to impede Allende's accession to power. Helms took notes and wrote that one of the goals was to "make the [Chilean] economy scream."¹ Years later, after Salvador Allende was overthrown in a coup d'état led by General Augusto Pinochet, on September 11, 1973, the US Senate published a report on "Covert Action" in Chile. The inquiry determined that between September 1970 and September 11, 1973, the US provided eight million dollars to the opposition to the *Unidad Popular*.²

Salvador Allende was inaugurated as president on November 4, 1970. In a front-page article, the *New York Times* summarized the incoming government goals as follows: "The president elect and his coalition have promised to nationalize Chile's mines and basic industry, its banking and insurance system, and foreign trade."³

On November 21, 1970, barely two weeks after inauguration, Henry Hecksher, the CIA chief of station in Santiago, sent a cable to headquarters in Langley, Virginia, titled "Advice by Fidel Castro to Salvador Allende." An unnamed Chilean diplomat had revealed that immediately after the election the Cuban leader had had a long phone conversation with Allende. During the two hours dialogue Castro urged the President-elect, "...not to repeat the same mistakes that he, Castro, admitted he had made vis-à-vis the United States ... [I]f he had it to do over again, he would proceed differently."⁴ According to the CIA's source, Allende listened carefully and said

¹ Richard Helms, "Meeting with the President on Chile," September 15, 1970, NSA. For details, see Seymour Hersh's two articles in *The Atlantic* (1982 and 1983). There is an ample literature on the Allende government. See Edwards (2023) and the literature cited therein.

² US Senate (1975), p. 1. The CIA considered two tracks to stop Allende from being confirmed as president by Chile's Congress, "Track I" and "Track II." See Edwards (2023) for details.

³ Novitski (1970). On the copper nationalization in Chile see Novoa (1972), Fortín (1979) and Bonnefoy (2024).

⁴ United States, Department of State (2014a)

that he “had no intention of antagonizing the United States beyond the point of no return.”⁵ However, barely seven months later he did exactly that, when, on July 16, 1971, his government enacted a constitutional reform that nationalized three American copper companies, two of them without paying any compensation – Anaconda Company and Kennecott Copper Corporation.⁶ The legal argument used by the Unidad Popular was based on the novel idea that “adequate” payment should be calculated as book value *minus* “excessive profits” obtained since 1955. In turn, excessive profits were defined, for every year, as profits above 12% of book value. Once the computations were made, the Chilean authorities concluded that the two largest American firms did not deserve any monies; in fact, they owed Chile some USD 400 million.⁷

The purpose of this paper is to analyze critically the nationalization of the large copper mines in Chile, in 1971, a time when Chile was the second largest producer of copper in the world. This was one of the earliest episodes of “expropriation without compensation,” a case that generated great interest in financial markets and among development economists.⁸ It also set important precedents in the legal world. The discussion in this essay covers several aspects of the process, including: (a) The historical relation between the American multinationals and Chile. (b) The so-called “Chileanization” of copper in the 1960s, when the Chilean state purchasing a percentage of the mines (usually 51%), and the formation of joint ventures between Chile and the American multinationals. (c) The basis of the “excessive profits” legal and economic doctrine. (e) The soundness of the methodologies used by Chile to determine the value of the companies and “excessive profits.” And (e) The US government and companies’ reaction to nationalization. I argue that the approach followed by the Unidad Popular government to calculate compensation was flawed, and that relatively minor adjustments would have resulted in some compensation being paid and, thus, in fewer tensions between Chile and the US in the years to come.

The rest of the paper is organized as follows: Section 2 provides historical background on the relation between Chile and the copper multinationals. I discuss the historical evolution of prices, production, profits and taxes. I analyze the two-steps “Chileanization” program implemented in the second half of the 1960s by the administration of Eduardo Frei Montalva,

⁵ United States, Department of State (2014a).

⁶ As is explained below, joint venture companies where Anaconda and Kennecott held between 49% and 70% of the shares were nationalized. A joint venture where Cerro de Pasco Corporation owned 49% of Shares was also nationalized. Cerro, however, did receive compensation.

⁷ Chuquibambilla was (and is) the largest open pit copper mine in the world. NYT “Allende accuses U.S. Copper Interests.” July 12, 1971, p. 1. Kennecott operated in Chile through its subsidiary Branden Copper Company. Anaconda through two subsidiaries, Chile Exploration Company and Andes Copper Company.

⁸ In the aftermath of the Chilean nationalization, jurists have disagreed on whether there was legal precedent for the “excessive profits” doctrine. According to some, Egypt (Suez Canal) and Iran (oil fields) had developed similar legal arguments. See Novoa (1972).

where joint ventures between Chile and the multinationals were created. Section 3 deals with the nationalization of the large mines during the administration of Salvador Allende. I analyze the constitutional reform of July 1971, and I discuss the principles behind the “adequate” compensation and “excessive profits” doctrines. I explain how the threshold of 12% to compute “extraordinary” profits were defined. Section 4 is devoted to a critical evaluation of the methodology used by the Chilean government to calculate the different components of compensation – adjusted book value and excessive profits. The analysis proceeds in steps, and alternative calculations based on “Price to Book” ratios and discounted cash flows are offered. I show that the calculation of excessive profits was marred by inconsistencies. I make the point that no adjustments for expropriation risk were made in the analysis. I argue that if a proper methodology had been used, positive compensation values would have resulted. In Section 5 I offer a summary and conclusions and I briefly discuss the reaction by the American multinationals and the US government to the nationalization of copper mines in Chile.

2. Chile and the Copper Multinationals in Historical Perspective

Starting in the early 1950s, the nationalization of the “Large Copper Mining” sector (*Gran Minería del Cobre*) became a recurrent theme in Chilean politics. With time, two views emerged. The Christian Democratic Party believed that the country should embark on a “Chileanization” process, where the state would buy a stake in each mine. This would be like the “Mexicanization” of oil refineries in Mexico. The purchase price and the percentage of shares bought would be negotiated between the parties. The Christian Democrats asserted that this proposal was not a “persecution against the [American] companies that have invested and developed our copper industry ... [It is not] a hostile initiative against the United States.”⁹

On the opposite side of the spectrum, the Left, led by senator Salvador Allende, had a more radical view. In a 1964 pamphlet titled “How we will nationalize copper,” Allende, who at the time was (unsuccessfully) running for president, advocated for a fast nationalization process. The goal was for the Chilean people to fully own every large mine through a state-owned company to be called Codelco. Under his plan the multinationals would be compensated. In page 7 of the pamphlet, we read: “Yes, we will pay for them [the mines].”¹⁰

2.1 The price is not right.

In October 1940, the Roosevelt administration fixed the domestic price of copper in the US at 12 cents per ounce.¹¹ Chilean copper, however, was sold to the US at 11.5 cents. That

⁹ Radomiro Tomic (1961). *Diario de Sesiones del Senado Sesión 20*, 18 de julio, 1961. Pp. 1074-1075.

¹⁰ Allende (1964), “Cómo vamos a nacionalizar nuestro cobre”. I. Horizonte. See also OCEPLAN (1964).

¹¹ US Department of Labor (1944), Bulletin No. 749.

price was maintained until 1950 and was significantly below the market price on the London Metal Exchange. A lower sale price meant lower profits and, thus, lower taxes paid in Chile by the American companies. In June 1950 the price paid for Chilean copper was raised to 24.5 cents per pound, still lower than on the London Metals Exchange (27.5 cents per pound, on average). In 1951, the price was raised again to 30 cents per pound, and producers were allowed to sell up to 30 percent at the higher London price. However, a prohibition to sell to socialist countries was strictly enforced. In August 1955, during the commodity boom triggered by the Korean War, Anaconda and Kennecott raised the price to 40 cents per pound. Chilean authorities, however, were not satisfied. A government official told the *New York Times* that “the metal is selling in Europe for as high as 47 cents a pound... [U]nless the companies comply [in raising the price further], the Government itself may start marketing copper abroad...”¹²

In 1955, and after strenuous negotiations with the foreign-owned companies, a new copper law was enacted. The legislation, known as the “New Treatment for Copper” (*Nuevo Trato del Cobre*), had three goals: to increase taxes paid by the American companies, to diversify the markets where Chilean copper was sold (sales to socialist nations were allowed), and to encourage the use of copper in Chilean manufacturing.¹³ The 1955 “New Treatment” accord replaced a 65% flat tax on profits with a sliding schedule aimed at encouraging output. A tax rate of 75% was applied if output was lower than a certain threshold. If that level was exceeded, the tax rate was reduced gradually until it reached 50% when output was doubled relative to the benchmark.¹⁴ The “New Treatment” regime was in place until 1966, when the administration of President Eduardo Frei started a gradual process of “Chileanization” that created joint ventures between the multinationals and the Chilean state.

In Figures 1 and 2 I present data on the price of copper in the United States for two periods: 1900 through 1930, and 1930 to 1975. The source is the US Geological Survey. As may be seen, between 1900 and 1930 the price was rather stable at around 15 cents per pound of refined copper. There is a peak during World War I, in 1917, when the price reached 26.3 cents, followed by a decline to historical levels in 1920. Figure 2 covers a longer period (1930-1975) and includes the Great Depression, World War II, the Korean War, and the nationalization of the large mines in Chile in 1971. As may be seen, prices collapsed by almost 60% during the Great Depression. The data also show the fixed price of 12 cents per pound during World War II (1941 through 1945). It is also possible to identify the boom during the Korean War in the 1950s. In

¹² NYT, “Copper boost scored: Spokesman Says Chile Wants More Than 40c a Pound,” 20 Aug 1955: 23.

¹³ In the late 1950s taxes and fees paid by the large mines amounted to over 80% of the government’s total revenue in foreign currency.

¹⁴ See Fortin (1975) for details.

1964, when Eduardo Frei was inaugurated president of Chile, the price was 31 cents per ounce. It then increased rapidly until it reached 47.5 cents per pound in 1969. While this 50% price increase was a boon for the mining companies, it represented a headache for the Frei administration, as the left argued that if the mines had been fully nationalized in 1967 the windfall would have been captured by Chile, and not shared with the multinationals.

[Figure 1 around here]

[Figure 2 around here]

2.2 “Chileanization” in the 1960s

During the Eduardo Frei administration “Chileanization” was implemented in two phases.¹⁵ In 1967, the government bought 51% of Kennecott’s subsidiary the Branden Copper Corporation, and the joint venture “Compañía Minera El Teniente” was created. During negotiations a team of independent consultants valued the mine, the largest underground copper mine in the world, at USD 244 million. According to the contract – which was enacted as Law No. 16,425 – Kennecott maintained a series of privileges, including the management of the mine, and continued to be its sales agent. The American company made a USD 80 million loan to the new joint venture, to finance a major expansion project. During the first phase of Chileanization (1966-67), the Anaconda Copper Company decided not to sell its Chuquicamata, El Salvador and Exótica mines. It did, however, make a commitment to increase production to a billion pounds per year (from 750,000). A new player – Cerro de Pasco Mining Company – entered the industry under the Chileanization joint venture rules. Its subsidiary Compañía Minera Andina was owned in 30% by Chile and 70% by the Americans.

The second phase of the Chileanization process took place in 1969 and dealt almost exclusively with Anaconda. The company agreed to sell 51% of Chuquicamata and El Salvador, and 25% of Exótica for book value (the sale price was USD197 million). Bonds issued by the state holding company *Corfo* were used to pay for the acquisition. Although in this phase there were no changes to the agreements with Kennecott and Cerro de Pasco, there was a reform in the tax regime affecting all mines. When prices exceeded 60 cents per pound, Chile would receive 91% of the excess, through a combination of higher taxes, dividends, and fees.

In Figure 3 I present data on the evolution of output in the El Teniente, Chuquicamata and El Salvador mines between 1940 and 1970, the last year before full nationalization. As seen,

¹⁵ There are many works that deal with Chileanization. See, for example, Novoa (1972) and Fortín (1979). See, also, President Eduardo Frei’s “Annual Message to the Joint Session of Congress” (*Mensaje Presidencial*) for 1968, 1969 and 1970.

a local maximum was reached, in the three mines, during World War II. It is also possible to see that after Chile passed the “New Deal for Copper” law in 1955, there was a steady increase in production. This upward trend continued after Chileanization. In Figure 4 I show “after tax profits” in the three large mines between 1955 and 1969. During most of the period Chuquicamata had the highest profits. El Teniente’s earnings grew rapidly in later years. El Salvador only became truly profitable after 1966. In 1969, the last year before the Unidad Popular’s nationalization process was initiated, profits were USD 117 million in Chuquicamata, USD 36 million in El Salvador, and USD 113 million in El Teniente.

[Figure 3 around here]

[Figure 4 around here]

3. The 1971 constitutional reform and the nationalization of copper

From early on, President Salvador Allende and his legal team, led by jurist Eduardo Novoa Monreal, decided that nationalization had to be carried out through a constitutional amendment rather than a simple law. This was important, they argued, because a constitutional reform automatically annulled existing contracts, including those in the 1966 and 1969 Chileanization legislation that established the joint ventures and gave the American companies legal assurances going forward.¹⁶ When drafting the nationalization reform, the government invoked the United Nations Resolution 1803 of 1962, a declaration stating that independent countries could legally claim ownership over their natural resources. Interestingly, the United States never questioned Chile’s legal right to nationalize or expropriate copper mines or other enterprises. The argument made by the White House, the State Department and the multinationals was that compensation had to be “just, adequate, and prompt.”¹⁷ The main US criticism was that the excessive profits doctrine was applied retroactively, since 1955.

On December 21, 1970, the government submitted to congress a proposal for a constitutional amendment that nationalized large copper mines.¹⁸ In a speech delivered that day, Allende said: “I want it to be perfectly well understood that this is not an act of aggression against the people of North America or against the United States government. We are going to apply the law and to pay compensation ...”¹⁹ Seven months of intense parliamentary discussion followed. During the debate, the Right introduced language making clear that the new legal text dealt exclusively with large copper mines; they didn’t want it to apply to smaller mines,

¹⁶ In 1960-69, there were 16 acts of expropriation in the mining sector around the world. See Hajzler (2012),

¹⁷ Kennecott (1972).

¹⁸ See Chile, National Congress Archives (2023). <https://obtienearchivo.bcn.cl/>

¹⁹ El Siglo, December 23, p. 7.

manufacturing firms, and/or agricultural landholdings. Senator Francisco Bulnes, the patriarch of conservative legislators, said: “We want to reaffirm that we are not opposed to the idea of nationalizing large-scale copper mines ...” He added that his party had “always maintained that if the circumstances advise nationalizing copper, it should be done under conditions of reasonable fairness ...”²⁰

3.1 The “excessive profits” doctrine

The “excessive profits” doctrine was, without any doubt, the most controversial and novel aspect of the Unidad Popular’s constitutional reform of 1971. The *New York Times* referred to it as a “new legal concept that reduces the potential valuation of the [mining] properties.” (Lillich, 1972).

To justify the subtraction of “excessive profits” from compensation, lawyer Eduardo Novoa Monreal and his team developed a legal theory based on a distinction between “expropriation” and “nationalization.” The former, they observed, had to do with specific assets – a truck, a building, a factory. In contrast, they argued, “nationalization” referred to a generally defined economic activity, and included every asset required for that activity to be carried forward by the community. For instance, a country could nationalize the health system, the banking sector, or the mining sector.

To comply with international law, “expropriation” required compensating the owner in a “just, adequate, and prompt” manner. That meant that compensation had to be based on the asset’s market price or economic value. On the other hand, they argued that when it came to “nationalization,” compensation did not necessarily have to be “just” or “prompt”; it only needed to be “adequate.” And, in the government’s view, to determine what was “adequate compensation” it was necessary to consider the interests of both the original owners and of the State that was getting control over the collection of assets. When this was done, and every angle of the problem was considered carefully, it was possible that from a strictly legal point of view no compensation had to be paid. When testifying in Congress, Eduardo Novoa Monreal emphasized that aspect of the proposed constitutional reform. He said: “[T]he term ‘nationalization’... is subject to a more advantageous position than the concept of ‘expropriation,’ a term which in many countries is still mistakenly translated as confiscation. For this reason, the term ‘nationalization’ now appears for the first time in the Constitution...”²¹ Not surprisingly, Anaconda and Kennecott strongly disagreed with this theory, and after the

²⁰ Chile, National Congress Archives (2023), p. 95.

²¹ See Congreso Nacional (1971), Historia de la Reforma Constitucional, Ley No. 17.450, p. 17.

amendment was passed in July 1971, they swiftly started legal actions, first in Chile and then in New York, Paris, Rotterdam, Stockholm and other jurisdictions; see Section 5, below.

3.2 The constitutional amendment

The amendment, which was unanimously approved by congress on July 11, 1971, introduced permanent changes to Article 10 of the constitution, an article that specified the extent, protection, and limitations of property rights. The most important provisions in the amendment, which received the name of *Law No. 17,450*, may be summarized as follows:

- It established, at the constitutional level, that all mineral deposits belonged to the state. This provision was already in the Civil Code, but the Allende government believed that it was important to add it to the constitution, giving it greater legal stature. The state, however, could sign concessions' contracts with private mining companies, allowing them to exploit certain deposits.
- It specified that this was a nationalization process. Companies were not being expropriated or confiscated.
- It abrogated contracts signed between the government and the American companies during the 1960s Chileanization process. At the time of the amendment Chile owned 51 percent of Chuquibambilla, El Salvador and El Teniente; 25 percent of Exótica; and 30 percent of Andina. After the amendment was passed the joint ventures ceased to exist.
- All assets and liabilities of the joint venture companies were transferred to the state copper company Codelco. Liabilities were approximately USD 700 million.
- The amendment established that the companies would be compensated “adequately.”²²
- The bases for adequate compensation were defined as “adjusted book value” of each mine.
- Adjusted book values were to be determined by the office of the Comptroller General of the Republic (*Contralor General de la República*). This was an autonomous institution of the state, chaired by Héctor Humenes, a respected lawyer.

²² The legal text said: “[T]he Comptroller General of the Republic will determine the amount of compensation to be paid ... The President of the Republic is authorized to instruct the Comptroller, when calculating the compensation, to deduct all or part of the excessive profits that the nationalized companies and their predecessors have earned annually [since 1955]”

- Adjusted book value was identified as the book value registered in the tax office, minus depreciation, revaluations after 1964, equipment in poor working condition, and the value of mineral deposits. When calculating adjusted book value there was no consideration for inflation in Chile or the United States.
- The amendment authorized the President of the Republic to subtract all, or a fraction of, “excessive profits” accrued since 1955.
- The President’s office could use one of two methods to calculate “excessive profits.” The first one was the difference between the profit rate obtained by the companies in Chile and that obtained in their mines in the rest of the world, including in the United States. Alternatively, “excessive profits” could be calculated as the difference between actual profits and those considered as “maximum reasonable profits” for foreign investors in treaties or international agreements signed by Chile, such as the Andean Pact of 1969. That treaty established a maximum profit rate by foreign companies of 14%.²³
- The office of the president had 30 days to determine deductions due to excessive profits. The Comptroller General of the Republic had 90 days to determine adjusted book value and total compensation.
- The amendment also gave the president the authority to determine if the joint companies had used loans provided by the multinationals in a productive way. If that was not the case, he could make deductions from compensation.
- An ad hoc tribunal was formed to deal with complaints by the American companies. The rulings of the Special Copper Tribunal (*Tribunal Especial del Cobre*) were not subject to appeals, not even to the Supreme Court.

3.3 Excessive profits

On September 26, President Allende met with US ambassador Edward Korry to discuss compensation in general and excessive profits in particular. The American envoy told the president that, although this was an issue between Chile and private corporations, the US government was indirectly involved. It turned out that Anaconda and Kennecott had expropriation insurance policies underwritten by OPIC, a US government agency. Thus,

²³ The Andean Pact, signed in 1969, was an agreement between Bolivia, Chile, Colombia, Ecuador, and Peru, to promote regional economic integration. Article 14 of the Pact established rule for foreign investment and established a maximum for profits of 14 percent.

American taxpayers would be on the hook if compensation was not “prompt, adequate, and just,” as mandated by international law.²⁴

On the night of September 27, Allende held a working dinner with a group of advisers, cabinet members, and members of congress involved in the nationalization saga. Towards the end of the meeting, Allende reminded them that the Constitution allowed him to subtract all or a fraction of the extraordinary profits. He then added that although the line dividing “normal” from “excessive” had been calculated at 10 percent, he would instruct the Comptroller General to subtract from Anaconda and Kennecott’s book value profits above 12 percent. He hoped that this goodwill gesture would placate the companies and the Nixon administration.²⁵

Table 1 presents a summary of the excessive profit rates, as calculated by Codelco. The table includes data on profit rates in Chile, in other jurisdiction, and in all mines. As may be seen, the average annual profit rate of Anaconda in its Chilean operations (Chuquicamata, El Salvador, and Exótica) was 20.2 percent; during the same period its profit rate outside of Chile was calculated by Codelco as only 3.5 percent. For Kennecott the calculated profit ratios were 34.8 percent in Chile (El Teniente) and 10 percent outside of Chile. No calculations were made for Cerro de Pasco, since it had started operations in the Andina mine in 1967.

[Table 1 around here]

On October 11, the Comptroller General announced the “adjusted” books values of the five mines; see Section 4 for details. Book value, minus certain adjustments, and minus “excessive profits,” determined total compensation for each company. The final decisions by the Comptroller are presented in Table 2. After every item was considered, Chuquicamata, El Salvador and El Teniente owed monies to Chile: USD 76.5 million, USD 1.6 million, and USD 310.4 million dollars respectively. The newer mines would receive some compensation: Exótica USD 10 million and Andina USD 18.3 million.

[Table 2 around here]

One day after the announcement, Ashley Hewitt, a staff member of the National Security Council, sent a memo to Henry Kissinger summarizing the latest developments. The message

²⁴ US Department of State (2014d).

²⁵ Arrate (2017, p. 315-316). Jorge Arrate told me the story, with minor variations, during one of our meetings in Santiago in 2023.

clearly shows the US government's concern about the insurance payments that OPIC would have to make to the companies (emphasis added):²⁶

“Allende’s decision setting an extraordinarily high figure for excess profits indicates not only that no compensation will be paid, but that the companies may well wind up owing the government. The government may use this device to justify default on some \$185 million owed to the American copper companies as a result of its purchase of a 51% interest in the equity in 1967 and 1969. *About \$85 million of this debt is covered by OPIC insurance payable to Kennecott.*”

4. Determining “Adequate Compensation”: A critical evaluation

A key question is whether the methodology used by Chile to calculate compensation for Anaconda and Kennecott was robust and professionally sound. Another important consideration is if an alternative approach – one aligned with modern financial principles—might have produced different figures and, consequently, a different outcome in terms of indemnification. Implicit in these questions is the idea that paying some compensation could have moderated the grievances of the companies and, more importantly, of the Nixon administration. Notably, two senior aides to President Salvador Allende—Orlando Letelier, the Ambassador to the U.S., and Max Nolff, the head of Codelco until September 1971—supported paying some compensation.²⁷

The discussion in this section tackles four issues related to Chile’s computations of “adequate compensation”:²⁸

- I first analyze the appropriateness of using “adjusted book value” as the basis for calculating compensation. Here I make the simple point that “economic value” usually exceeds “book value,” and that that under many circumstances the difference is properly captured by the “price to book” ratio.
- I use the discounted cash flow (DCF) methodology to provide alternative valuations for the nationalized mines. In all cases, under different parametrizations, the resulting DCF valuation is higher than the book value. In some cases, the difference is substantial.

²⁶ US Department of State (2014b). A stamped notation on the memorandum indicates Kissinger saw it. Haig initialed the memorandum.

²⁷ Nolff (1993) refers to his disagreement with Allende on the issue, and his resignation as head of Codelco.

²⁸ I restrict myself to economic considerations – that is, no legal subjects are addressed:

- I scrutinize the calculation of excessive profits made by Codelco, and I unearth data inconsistencies. I conclude that the methodology was flawed and overstated profit rates by the American multinationals in Chile.
- I use the results obtained from these exercises to calculate new figures for “adequate compensation.” I show that even if the principle of subtracting “excessive profits” is maintained, compensation would have been positive for the three mines under consideration.

Before proceeding a word of caution. For some calculations I present ranges of values rather than point estimates. The reason is that the archives are incomplete and that, in some cases, key documents are missing. In particular, the technical study prepared by Codelco to calculate yearly excessive profits is nowhere to be found. That is, modern researchers cannot vet the professionalism of methodology and calculations. Only three pieces of information have survived regarding “excessive profits”: (i) Summary average profit ratios for 1955-1970 for each company (see Table 1). (ii) The dollar amounts of the deductions based on “excessive profits,” which were presented by the Comptroller in Resolution 529 of October 11, 1971 (See Table 2). And (iii), an incomplete year-by-year calculation of profit rates in Chile for both companies. These annual figures were presented by Codelco’s head Jorge Arrate in a press conference on October 14, 1971 (See Table 4).²⁹ In that press briefing Arrate explained the rationale for setting 10% as the dividing line between what was “normal” and what was “excessive” in terms of returns. He said:³⁰

“American investors go to Canada or Europe, and they are satisfied with a rate of return of 9% or 10%, but when they come to an underdeveloped country [like Chile], they are not satisfied unless they get returns in the order of 20 or 30 percent, or higher.”

4.1 The constitutional mandate

The constitutional procedure to calculate “adequate compensation” consisted of three well-defined steps.³¹

²⁹ See *La Nación*, October 15, 1971, p. 2. Jorge Arrate gave the press conference. Codelco’s CFO Pablo Nudelman, and lawyer Eduardo Novoa Monreal were also present. See, also, Novoa (1972, p. 276).

³⁰ Novoa (1972, p. 277);

³¹ Contraloría General de la República, Resolución 529. Octubre 11, 1971.

- In the first phase the book value of each of the mines was ascertained. To do this the Comptroller's office used financial statements submitted by the multinational subsidiaries to Chile's tax authority.
- In the second step the value of assets and equipment in disrepair were subtracted from book value. In Kennecott's case an additional adjustment was made. The 1967 revaluation of assets, which was done during the Chileanization of El Teniente (for a total of USD 198 million), was deducted from book value. This was one of the most contested issues in international litigation that followed.³²
- In the third step, the Comptroller asked the President's office for the "excessive profits" that should be subtracted from the adjusted book value. As noted, estimates of excessive profits were made by a team of Codelco professionals and, in principle, were based on the difference between the profit rate obtained by the companies in their Chile activities and in their operations in the rest of the world. The President had the authority to subtract all or part of excessive profits.

In the analysis that follows I show that in every one of these steps there were problems that tended to underestimate the final value of compensation.

4.1 Book value as the bases for compensation

It is well known that book value, a metric based on the historical cost of assets, is not a good indicator of a company's economic value. For publicly traded companies the discrepancy between book and economic value is captured by the 'Price to Book' (P/B) ratio. Both Anaconda and Kennecott were listed on the New York Stock Exchange, and their P/B ratios could have been used to adjust the book value to obtain a fairer calculation of economic value. According to Moody's Industrial Manual from the 1950s and 1960s (several issues), the average, highs and lows of the daily P/B ratios for 1955-1970 for the two companies were:

	<u>High P/B</u>	<u>Low P/B</u>	<u>Average P/B</u>
<i>Anaconda</i>	1.31	0.77	1.04
<i>Kennecott</i>	1.66	1.10	1.38

³² Kennecott (1972).

Although these ratios are for the whole companies, and not just for their Chilean subsidiaries, they do provide useful information that suggests that by using book value the Comptroller's office underestimated the true value of the mines.

4.2 The "revaluation" of Kennecott's assets during Chileanization

In late 1966, when Kennecott negotiated with the government for the sale of 51% of El Teniente, independent consultants valued the mine at USD 244.40 million. At the time, however, the accounting book value was only USD 72.45 million. Thus, to carry out the transaction both parties agreed on a revaluation of assets to a new total of USD 285.4 million. This procedure was accepted by Chile's tax authority. The 1971 constitutional amendment, however, allowed the Comptroller to subtract revaluations made after December 1964. This resulted in a reduced book value for Kennecott of USD 120.8 million; see Table 2. During legal procedures, in Chile and in international jurisdictions, Kennecott argued that this adjustment violated the contract that had created the joint venture. (For the company's legal briefs, see Kennecott 1992).

4.3 Valuation using discounted cash flow.

In 1970, when the Unidad Popular submitted the constitutional amendment to congress, it was understood that book value was an important accounting tool to determine tax liabilities, but not a good metric for calculating the true economic value of an ongoing concern. To calculate the economic value investors relied on other techniques, including market capitalization, if enough shares were publicly traded, multiples, and discounted cash flow (DCF) calculations. In this subsection I provide estimates of the economic value of the three large mines using the DCF methodology. These are approximate figures, since, as noted, some of the key archival data have been lost and had to be reconstructed. Nonetheless, the estimated values reported here allow us to assess the reasonability of the Comptroller's calculations.

In the DCF methodology, the *enterprise value* (EV_t) of a company at time t is given by the following equation:³³

$$(1) \quad EV_t = \left(\frac{FCF_t}{r-g} \right) - \left(\frac{FCF_t / (r-g)}{(1+r)^k} \right),$$

³³ See, for example, Koeller, Goedhart and Wessels (2015, Chapter 8).

where FCF is free cash flow, r is the cost of capital (the $WACC$, or weighted average of the cost of equity and debt), g is the rate of growth of FCF through time, and k is the number of years considered in calculating the present value of the company (i.e. the life of the mine). FCF , in turn, is defined as operating profits net of taxes, plus depreciation, minus capital expenditures (capex). Equation (1) provides a powerful and simplified version of the DCF approach, where the evolution through time of net earnings, depreciation, and capex are summarized by the parameter g . A more detailed version of the DCF is given by the canonical equation for net present value, where flows for each year $t+i$ are projected individually:

$$(2) \quad EV_t = \sum_{i=0}^k \frac{FCF_{t+i}}{(1+r)^{t+i}}.$$

Equity value, which is the variable of interest to determine compensation, is obtained by subtracting debt from the enterprise value calculated using equations (1) or (2). That is:

$$(3) \quad Equity_t = EV_t - Debt_t.$$

Equations (1) and (2) are two alternative (and under certain assumptions, equivalent) ways of calculating a company's enterprise value. In terms of data requirements, equation (2) is more demanding. To implement (2) we need to project separately, and for every year, output, prices, taxes, operating costs, depreciation, and capital expenditures. Since undertaking that detailed exercise is beyond the scope of this paper, I have relied on the more compact version of DCF given by equation (1) and I have performed sensitivity analyses to assess the sturdiness of the calculations.

The following data sources were used: net earnings, depreciation and taxes were taken from the companies' financial statements as reported in Novoa (1972), Senado de Chile (1971), and the Council for the Defense of the State (Consejo de Defensa del Estado). Capex figures were constructed based on historical "capex per pound" data (See Senado de Chile, 1971, p. 48). In the base case scenario, the following parameters were considered: $g=2\%$, and $k=30$. A growth rate of 2 percent ($g=2\%$) is in line with the average historical rate of expansion of output in the three mines and implies that in 35 years the size of the operations will double. I used two alternative values for the cost of capital: $r=10\%$, and $r=12\%$. These WACCs are consistent with recent studies for copper mines in Chile. For example, after reviewing the literature, González et.

al. (2023) concluded that a *WACC* of 10% was the most adequate for evaluating Codelco's performance since 1971. Initial net earnings (a key component of FCF) were defined as the average net earnings for 1967-1970. This way, earnings were smoothed and were not affected by a jump observed in the three mines in 1970, the last year before nationalization. Debt for each company was taken from the World Bank (1974) and company financial statements. At the end of 1970, the level of debt was USD 288 million for Chuquicamata, USD 63 million for El Salvador, and USD 358 million for El Teniente.

The results for the base case scenario are reported in Table 3, where I also present the book value set by the Comptroller's office and the "excessive profits" numbers determined by the office of the President. These figures correspond to the equity value. That is, they are enterprise value, calculated using DCF, minus debt for each company. As may be seen, in every case the DCF computations generate higher valuations than the Comptroller's book values. In some cases, the differences are substantial. For example, the DCF valuation for El Teniente with $r=10\%$, $g=2\%$, and $k=30$, is more than double the book value determined by the Comptroller (USD 665.5 million vs 318.8 million). It may also be seen that in five of the six cases – the exception is Chuquicamata with $r=12\%$ – the DCF valuation exceeds the government's estimates for excessive profits. For example, for $r=10\%$, every mine would have received some compensation, even if the excessive profits are not adjusted down. (On this, see the discussion below).

[Table3 around here]

To analyze the robustness of the calculations, sensitivity exercises were undertaken. The following is a summary of the most relevant ones. (Additional results are available on request):

- When earnings, depreciation and capex are based on the average of 1969-1970 (instead of average 1967-1970) DCF valuations increase significantly. With $r=10\%$, $g=2\%$, and $k=30$ Chuquicamata's valuation increases to USD 504 million, El Salvador to USD 149 million, and El Teniente to USD 949 million. This is because between 1969-1970 the mines saw a large jump in profits, stemming from strong prices.
- A longer "life of mine" increases DCF valuations. For instance, if $k=50$, the DCF valuation of Chuquicamata's equity increases by 8.4%; El Salvador's by 10.6%, and El Teniente's by 8.1%.
- As expected, the results are sensitive to the assumptions regarding the rate of growth of FCF through time. If we assume that $g=3\%$, valuation increases, on average, by 22%.

Something similar happens if the cost of capital r changes; a higher r results in a lower valuation.

Although this analysis does not settle the issue of valuation in a definitive way, it does provide important evidence in support of the idea that the Government's calculations considerably underestimated the economic value of the nationalized mines.

4.4 Excessive profits: Data inconsistencies and alternative estimates

The subtraction of "excessive profits" from book value was the most controversial aspect of the constitutional reform. As noted, "excessiveness" was defined, in principle, as the difference between profit rates in Chile and in the rest of jurisdictions where the companies operated. Calculating excessive profits, however, was not easy. In the US, the companies only reported consolidated financial results for all operations; there was no detailed public information on subsidiaries (except for Anaconda for a short period), and the companies would not open their books to Chilean officials.³⁴ As a consequence, the Codelco team decided to use two different data sources: data on the overall profit rates (for all operations) were obtained from the companies' financial statements submitted to US regulators and to the New York Stock Exchange. Profit rates for the Chilean subsidiaries were constructed from their financial statements and from tax returns submitted to Chile's tax authority. There was a problem, however, since the two data sources were based on methodologies that were not fully consistent.³⁵ I address this issue when discussing Table 6.

In the analysis that follows I show that there were significant inconsistencies in Codelco's calculations of "excessive profits."³⁶ Moreover, I show that if these inconsistencies (and mistakes) had been corrected, the amounts deducted would have been significantly lower, and "adequate" compensation would have been positive for the three mines.

Codelco's year to year calculations: In Table 4 I present Codelco's calculations for profit rates in Chile for the two companies for 1955-1970.³⁷ Two related and important points emerge from these data:

³⁴ Anaconda, however, did release to the public data on its Chilean subsidiaries from 1950 through 1959. These data are used below to make adjustments to the Codelco calculations.

³⁵ Correspondence between the Chilean embassy in DC and government officials shows that data published in Moody's were used. Copies of that correspondence are in the archives in the Ministry of Foreign Affairs. Data on the companies' financial statements are from the Council for the Defense of the State.

³⁶ I am not making a statement regarding the legal validity of applying the concept of "excessive profits" retroactively.

³⁷ These data were provided by Codelco's President Jorge Arrate in a press conference held on October 14, 1971; for reasons never explained, figures for Kennecott during 1963-1966 were not given.

- The averages for Kennecott profit rates in Chile do not match the summary data used by the Comptroller, and reported by Fortín (1975), the World Bank (1974) and others (see Table 1). The divergence, in fact, is substantial (59.1% vs 34.8%). For Anaconda, on the other hand, the average in Table 4 is similar to the Comptroller's number in Table 1 (20.9% vs. 20.2%).
- There is a very significant jump in Kennecott's profit rates after 1967; from 32.9% to 106.4% (1968), 113.7% (1969), and 205.5% (1970). Nothing similar happens with Anaconda, whose profit rates remain rather stable from 1966 through 1970. The jump in Kennecott's profit rate after 1967 coincides with the sale of 51% of the shares of subsidiary Branden Copper to the Chilean government during the first phase of Chileanization. At the heart of these anomalies is the revaluation of the company's assets (and book value) discussed earlier. Indeed, the numbers for Kennecott's profit rates in Table 4 were calculated by Codelco using the old (unadjusted) book value as the denominator. If the new book value is used (USD 365 in 1970) profit rates are reduced significantly, as shown in Table 5.

[Table 4 around here]

[Table 5 around here]

Profit rates using comparable data: Between 1950 and 1959 Anaconda submitted detailed information on its Chilean subsidiaries to the New York Stock Exchange. This means that for those years (and for those years only) it is possible to calculate profit rates in every jurisdiction using comparable and consistent data; see Table 6. Two interesting facts emerge from this exercise. First, Anaconda's own data show that profit rates in Chile, indeed exceeded worldwide profits in every year for which there is information. Second, the difference between Chile and worldwide profits based on Anaconda's data submitted to the NYSE is significantly smaller than that calculated by Codelco: 12.5% vs 22.0%.

[Table 6 around here]

4.5 Expropriation risk

Codelco's computations of "excessive profits" ignored the existence of country or expropriation risk. In an uncertain world investors internalize the probability of nationalization without proper or fair compensation. Given this risk, companies demand a higher return in the riskier jurisdiction. To illustrate this, consider a two countries world, where in country A (advanced) the probability of expropriation is zero. In country D (developing), on the other hand, the probability of expropriation is p . Further, assume that if expropriated, the investor gets

compensated by a fraction β of the economic value of the investment. In equilibrium, and under the assumption of risk neutrality, the following relation between the rate of return in the two countries will hold (p is the probability of expropriation):

$$(4) \quad r_D = \frac{r_A}{A} + \frac{p(1-\beta)}{A}.$$

Where $A = (1 - p(1 - \beta))$. Notice that if $p = 0$, there is no probability of expropriation, and $r_D = r_A$. In addition, if compensation is equal to economic value, $\beta = 1$, and, as expected, there is no difference in return across countries, $r_D = r_A$. This is an admittedly simple rendition of expropriation risk, but it serves the purpose of illustrating the point that not all of the differences in returns can be attributed to “excess,” in the sense of monopolistic rents.³⁸ An example: assume that $r_A = 11.6\%$ (Kennecott’s worldwide return), and that there is a 10% probability of expropriation ($p = 0.10$). Assume further that if expropriated, compensation will be only one half of the true economic value of the assets ($\beta = 0.5$). Under these circumstances the return in country D is 22 %. The difference between 22% and 11.6% is a justifiable premium of doing business in country D; from an economic point of view, it is not “excessive profits.”

For both Anaconda and Kennecott, the perceived probability of expropriation in Chile was greater than zero and had been growing since the early 1960s. For example, on May 2, 1969, the US embassy in Chile sent a cable to the State Department titled “Imminent Copper Nationalization?” where the official who wrote the report points out that the probability of full nationalization was rapidly increasing.³⁹ Because of this high risk both companies purchased expropriation risk insurance from Opic, the US government agency.⁴⁰

4.6 Alternative compensation estimates

The analyses presented above show that there were important shortcomings in the government’s calculations of compensation. These shortcomings were present in every step of the process. To illustrate the order of magnitude of these problems, in this subsection I present new estimates of “adequate” compensation using the corrections/adjustments discussed above. I consider two alternatives: In Option A the book value of each mine is adjusted by the

³⁸ On country risk and default in the 1970s see, for example, Feder and Just (1977), Edwards (1984, 1986) and Folkerts-Landau (1985).

³⁹ US Department of State (2014c)

⁴⁰ US Department of State (2014e)

corresponding “price to book” ratio. In Option B, I use the valuation obtained from the DCF, instead of book values. The rest of the adjustments are the same for both options:

- I annulled the deduction of Kennecott’s assets revaluations of 1967. That is, I set it equal to zero, to preserve the 1966 agreement between Kennecott and Chile, that created the joint venture company for El Teniente.
- I maintained the deductions due to assets in disrepair, determined by Codelco.
- I adjusted the threshold between “normal” and “excessive” profits from 12% to 14% per year. This adjustment is justified by adding a reasonable 2 percentage points country risk and expropriation premium to the government’s 12% number. In addition, setting the threshold at 14% was an option included in the 1971 constitutional reform; see Section 3.

The results from these computations are presented in Table 7. Panel A contains Option A, and Panel B, summarizes the results from Option B. As may be seen, these exercises produce positive compensation figures for the three mines, under both options. It is important to note that in these exercises I have maintained the controversial “excessive profits” subtractions. The amounts deducted are smaller, because the threshold was raised to 14%, but the principle was maintained.⁴¹

[Table 7 around here]

5. Concluding remarks

As soon as the constitutional reform was proclaimed, Kennecott and Anaconda began legal proceedings. Kennecott’s first step was to present a complaint to the Special Copper Tribunal in Chile. Its lawyers pointed out that the excessive profits calculated by the Office of the President (USD 410 million) greatly exceeded the accumulated income received from the El Teniente mine in the 15 years spanning from May 5, 1955, to December 31, 1970 (USD 253.3 million). It was absurd, they claimed, that “excessive profits” exceeded “total profits.” The complaint was withdrawn when, on March 18, 1972, the Special Tribunal ruled that it had no jurisdiction over the “excessive profits.” The constitutional amendment, it noted, explicitly stated that only the president had decision power over the issue, and that no appeal was possible. After withdrawing the complaint in Chile, legal actions in New York and other jurisdictions were initiated. Anaconda decided to skip the Special Tribunal, and to directly pursue financial remedy in international courts. The companies’ lawyers centered their arguments on the retroactive

⁴¹ In the legal proceedings that followed, Kennecott objected strenuously to this adjustment, arguing that under applicable law it was inappropriate to apply this principle retroactively. (Kennecott, 1972).

nature of the excessive profits' calculations. This, they opined, violated sacred principles of international law.

The disagreement between the Chilean government and the companies – and litigation in international courts -- continued until President Salvador Allende was deposed by General Augusto Pinochet in the September 11, 1973, coup d'état. One of the earliest goals of the military junta was establish solid commercial and financial relations with the United States. This required, first and foremost, to deal satisfactorily with the copper companies' compensation. After lengthy negotiations that included unpaid taxes by the American companies, an agreement was reached in late 1974. Anaconda settled for USD 253 million, significantly lower than its USD 325 million claim. Kennecott settled for USD 68 million, with a claim of USD 276 million. And Cerro de Pasco settled for USD 41.8 million with a claim of 37.5 million.⁴² However, agreeing on the compensation amounts was only part of the problem faced by the military junta. An additional issue was the legal framework under which the agreement was enacted. The military wanted it to comply with the constitution and, thus, needed to amend it. This was done by issuing three Decrees-Law (DL) that reformed the constitution and allowed the payments to be made. These were DL 601 from July 23, 1974; DL 701 from October 24, 1974; and DL 821 from December 27, 1974.⁴³

The analysis presented in Section 4 of this paper shows that Chile's calculations of indemnity was flawed in several regards. According to the calculation summarized in Table 7, even if the (contested) "excessive profits" principle was maintained, a sound methodology, based either on "price to book" ratios or DCF valuations, would have resulted in positive compensations, in 1971, within the following ranges: Chuquicamata mine, USD 44.3 million to USD 80.9 million; El Salvador mine, USD 11.2 million to 29.3 million; El Teniente mine, USD 29.8 million to USD 71.7 million.

⁴² Sigmund (1980, p. 38).

⁴³ For the text of the DLs see Biblioteca del Congreso Nacional, Chile.

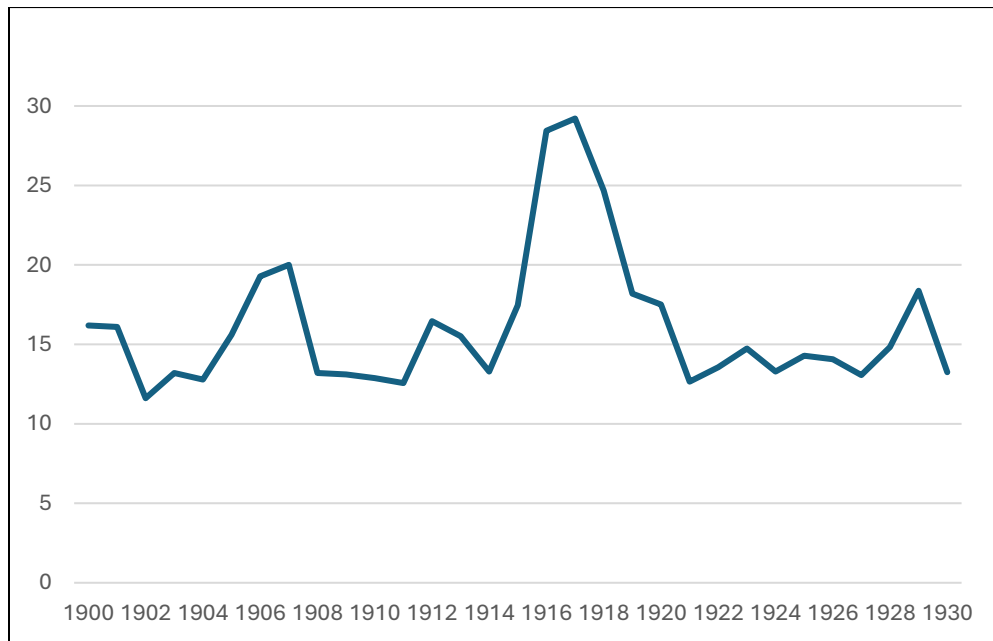


FIGURE 1: Price of Copper in the US, 1900-1930 (USD Cents)

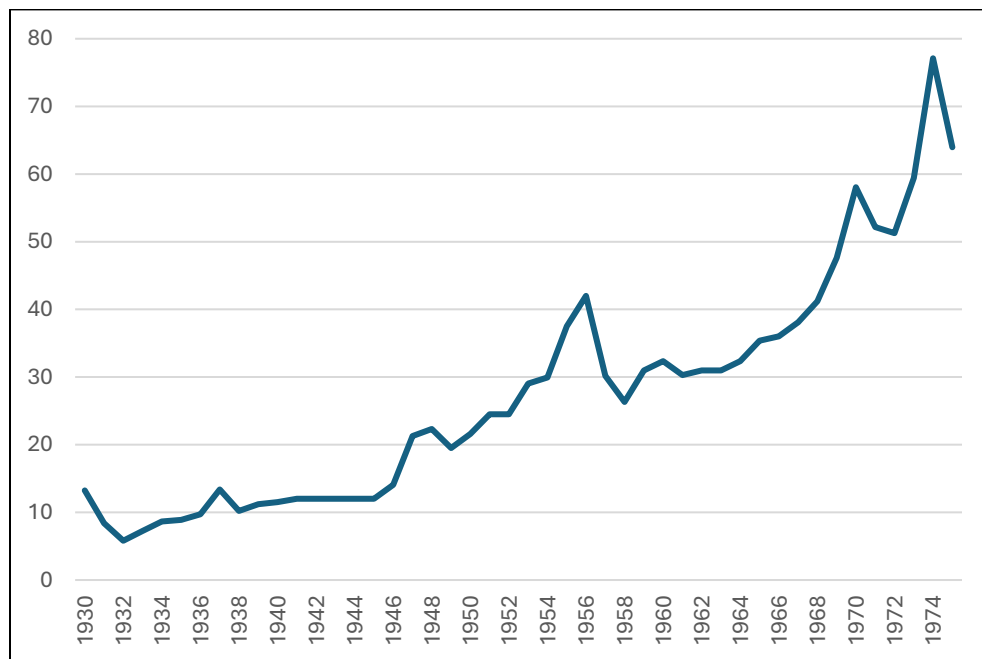


FIGURE 2: Price of Copper in the US, 1930-1974 (USD Cents)

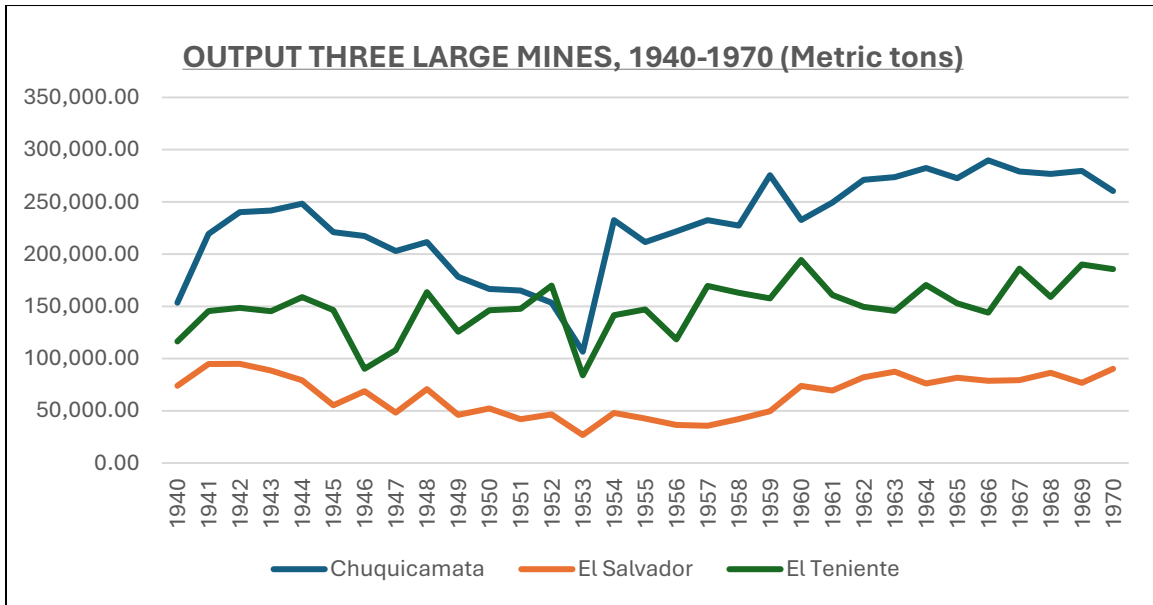


Figure 3: Output in Chile's Three Largest Copper Mines (Tons)

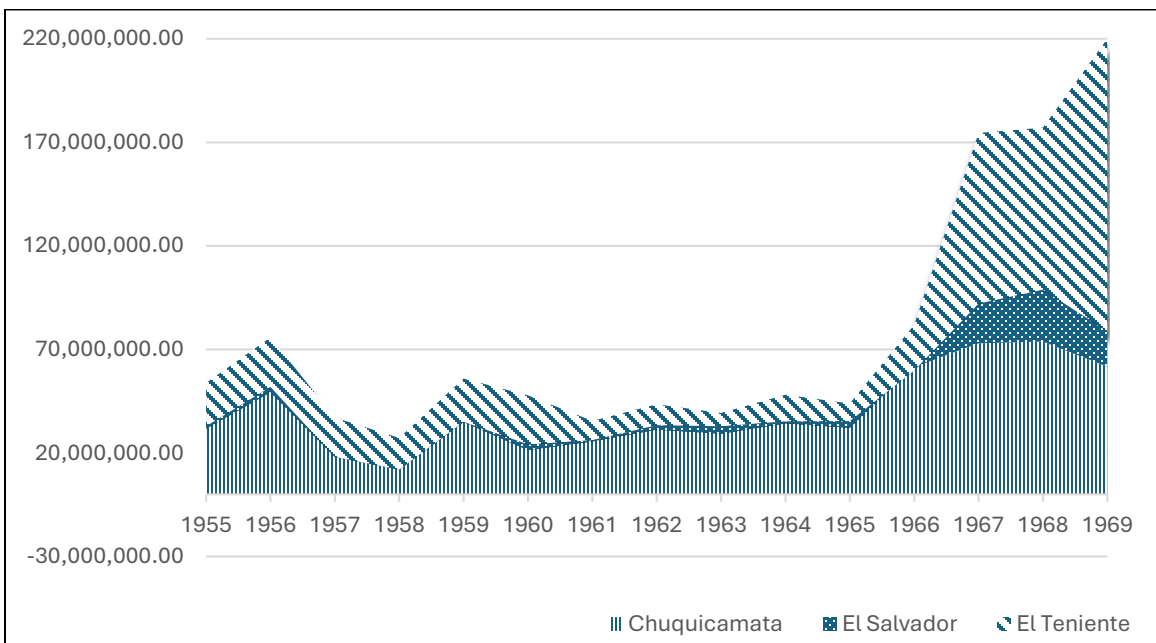


FIGURE 4: After Tax Profits in Three Major Copper Mines, 1955-1969, USD

(Source: Novoa 1972)

TABLE 1**PROFIT RATES CALCULATED BY CODELCO FOR MINING COMPANIES**

Table 6.2. <i>Net Annual Profits of the Gran Minería in Percentage of Book Value, 1955–70</i>			
	<i>In Chile</i>	<i>Outside Chile</i>	<i>Overall</i>
Anaconda	20.2 ^a	3.5	7.2
Kennecott	34.8	10.0	11.6
^a Chile Exploration Company.			
Source: CODELCO.			

Source: Fortín (1975)

TABLE 2
TOTAL COMPENSATION TO MINING COMPANIES, 1971

	<u>Chuquicamata</u>	<u>El Salvador</u>	<u>El Teniente</u>	<u>Exotica</u>	<u>Andina</u>
	(U.S.\$ millions)				
<u>Book value on</u> December 31, 1970	242.0	68.4	318.8	14.8	20.2
<u>Less Deductions</u>					
Mineral rights	5.4	0.4	0.2	0.2	1.5
Faulty installations	13.1	5.6	20.5	4.6	0.3
Excess profits	300.0	64.0	410.0	-	-
Revaluations	<u>-</u>	<u>-</u>	<u>198.5</u>	<u>-</u>	<u>-</u>
Total deductions	318.5	70.0	629.2	4.8	1.9
Total compensation	<u>- 76.5</u>	<u>- 1.6</u>	<u>- 310.4</u>	<u>10.0</u>	<u>18.3</u>

Source: Contraloría General de la República

Table 3**Economic vs Book Value of Nationalized Mines, Based on DCF (Millions of US dollars)***

	<u>Chuquicamata</u>	<u>El Salvador</u>	<u>El Teniente</u>
<u>Economic Value (EV) based on DCF (r = 10%; g = 2%; k=30)</u>	415.3	122.2	665.5
<u>Economic Value (EV) based on DCF (r = 12%; g = 2%; k=30)</u>	288.3	89.2	481.8
<u>Book Value determined by the Comptroller's office</u>	242.0	68.4	318.8*
<u>Memo Item:</u>			
<u>Excessive Profits determined by the office of the President</u>	300.0	64.0	410.0

* For Kennecott the Comptroller's book value is before the deduction for "revaluations."

Source: Own calculations. See the text for details.

TABLE 4:
Annual Estimates of Profit Rates of Anaconda
and Kennecott in Chile, 1955-1970

	Anaconda*	Kennecott**
1955	30.0	48.5
1956	35.4	46.1
1957	14.0	35.5
1958	9.0	29.1
1959	21.6	36.2
1960	13.0	33.2
1961	13.0	15.0
1962	15.0	14.0
1963	14.0	
1964	16.0	
1965	16.0	
1966	27.9	32.9
1967	26.8	106.4
1968	25.6	113.7
1969	36.8	205.5
1970	20.6	52.8
AVERAGE	20.9	59.1

* Chuquicamata only.

** Data for Kennecott for 1963-1965 not provided

Source: Jorge Arrate's press conference on October 14, 1971, as reported by La Nación (1971), Novoa (1972), and Bravo (1974)

TABLE 5
Adjusted Profit Rates for Kennecott
in Chile and Worldwide, 1955-1970

	<u>Kennecott Profit Rates in Chile, Adjusted for Revaluation and Missing Years (%)</u>	<u>Kennecott profit rate worldwide operations (%)</u>
1955	48.5	18.5
1956	46.1	19.8
1957	35.5	10.8
1958	29.1	7.9
1959	36.2	7.6
1960	33.2	10.4
1961	15.0	8.3
1962	14.0	8.7
1963	14.0	7.4
1964	17.9	8.3
1965	14.8	12.2
1966	32.9	13.6
1967	40.1	11.4
1968	42.8	10.9
1969	77.5	14.9
1970	19.9	15.8
Average	32.3	11.6

Source: La Nación (1972) and own calculations; see text for details

TABLE 6**Comparison of Anaconda's Profit Rates According to Source:****NYSE vs Codelco**

	A	B	C
	Anaconda's Profit Rates in Chile NYSE	Anaconda's Worldwide Profit Rates NYSE	Codelco's estimates of Profit Rates for Anaconda
1955	15.4	9.3	30.0
1956	20.7	14.5	35.4
1957	7.7	5.1	14.0
1958	5.1	3.8	9.0
1959	13.5	6.5	21.6
Average	12.5	7.9	22.0

Source: Mergent Inc. (1955-1970) Moody's Industrial Manual; La Nación, October 15, 1971.

TABLE 7A: Alternative Compensation Calculations for Three Largest Mines, Based on P/B Adjustment for Book Value, 1971 (Millions USD)

	<u>CHUQUICAMATA</u>	<u>EL SALVADOR</u>	<u>EL TENIENTE</u>
Book value adjusted by (P/B) ratio	251.7	71.1	439.9
Less Deductions			
Mineral Rights	5.4	0.4	0.2
Faulty Installations	13.1	5.6	20.5
Excess Profits with 14% benchmark	188.9	53.9	389.4
Revaluations	--	--	--
Total Deductions	207.4	59.9	410.1
Total Compensation	44.3	11.2	29.8

*Source: See text.

TABLE 7B: Alternative Compensation Calculations for Three Largest Mines, Based on DCF Calculation for Base Economic Value, 1971 (Millions USD)

	<u>CHUQUICAMATA</u>	<u>EL SALVADOR</u>	<u>EL TENIENTE</u>
Economic Value Based on DCF	288.3	89.2	481.8
Less Deductions			
Mineral Rights	5.4	0.4	0.2
Faulty Installations	13.1	5.6	20.5
Excess Profits with 14% benchmark	188.9	53.9	389.4
Revaluations	--	--	--
Total Deductions	207.4	59.9	410.1
Total Compensation	80.9	29.3	71.7

*Source: See text.

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