Mining Science, vol. 32, 2025, 135–154

www.miningscience.pwr.edu.pl

Mining Science

(Previously Prace Naukowe Instytutu Gornictwa Politechniki Wroclawskiej, ISSN 0370-0798)

ISSN 2300-9586 (print)
ISSN 2353-5423 (online)

Received January 9, 2025; Reviewed; Accepted August 7, 2025

ECONOMIC POTENTIAL OF ECUADOR'S MINING SECTOR AND INTRINSIC STOCK VALUE ANALYSIS OF COMPANIES OPERATING IN ECUADOR

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Abstract: Economic and social development are inextricably linked to commodities. The attractiveness of a given mining sector in a given country and its economic potential are reflected in the market values of specific mining companies. This study examines the economic potential of Ecuador's mining sector and assesses investment opportunities through intrinsic stock valuation. Recent political developments have created a favorable environment for large-scale foreign mining investment, attracting growing international interest. The study contributes to the existing literature by addressing a notable gap: the lack of quantitative assessments of Ecuador's mining sector and the absence of stock-level valuation analyses specific to this geographic and sectoral context. Using Dividend Discount Models (DDM), Earnings Models (EM), and Cash Flow Models (CFM), it evaluates companies operating in or investing in Ecuador, a country positioned along the Andean mineral belt – one of the world's *richest* geological zones. By applying established financial models, this research offers a structured approach for evaluating mining-related equity investments in emerging markets. The analysis identifies undervalued and overvalued stocks based on fundamental valuation metrics, with firms such as Dundee Precious Metals, Lundin Gold, and Anglo American demonstrating high investment potential, while BHP group and Silvercorp Metals appears overvalued. These findings are contextualized within broader commodity market dynamics, offering insights into risk-adjusted investment attractiveness.

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doi: DOI 10.37190/msc209121

Keywords: *commodity markets, Ecuadorian mining sector, intrinsic stock value, valuation techniques and predictive models*

1. INTRODUCTION

Raw materials are unquestionably crucial to the global economy. They form a strong industrial base, producing a wide range of products and components integral to everyday life and modern technologies. Commodity markets, including those for metals and minerals, play a pivotal role in determining resource availability, price stability, and long-term investment opportunities. This is particularly true for the European Union, partially for technologies related to green energy and renewable resources, which are increasingly important in addressing current global trends (European Commission 2024a). The EU market is actively seeking reliable suppliers, and one potential region for importing these materials for industry is Latin America (European Parliament 2023).

Investing in companies that extract these resources is one way to participate actively in the raw materials supply chain.

As commodity markets continue to shape global trade and capital flows, investment in mining firms offers exposure to price fluctuations and supply dynamics, making it an attractive option for portfolio diversification (Pinto 2020).

Latin America, among other raw materials, is known for its historically rich deposits of gold, silver, and copper. Ecuador is especially notable among the countries in this region. Traditionally overshadowed by neighbouring countries like Colombia, Bolivia, Chile, Argentina, Peru, and Brazil, which have more established mining sectors, Ecuador has recently attracted a substantial number of foreign investors. It is quickly emerging as a significant player, particularly in gold production and exports (Mestanza-Ramón et al. 2022a).

Ecuador has world-class gold deposits, and expert geologists believe it also has copper reserves comparable to Peru, which is the world's second-largest copper producer. In addition to metals like gold and silver, the country also harbours rare-earth elements and other critical raw materials, essential for renewable technologies and high-tech industries. The extraction and trade of these commodities directly impact global commodity markets (Global Americans 2022).

Ecuador's rise as a significant player in the mining industry starting in 2007, under the Rafael Correa government. This shift created the conditions for the emergence of publicly traded mining companies in the last decade, leading to large-scale production at sites like the Mirador and Fruta del Norte mines (Mestanza-Ramón et al. 2022b).

The growth of publicly traded companies in Ecuador's mining sector, combined with the current favourable state of mineral reserves and resources, presents an intriguing investment opportunity. This situation prompts the research question: Can mining companies

operating in Ecuador be considered to have strong investment potential? The authors of this article are primarily interested in finding a relevant answer to this question.

Calculating a stock's intrinsic value, a component of fundamental analysis is a suitable tool for investment decision-making. Fundamental analysis is considered one of the most comprehensive methods (Pinto 2020; Koller 2020).

The intrinsic value of stocks is calculated from data from financial statements, stock prices, past dividends, cash flows, and others, with the results indicating whether the stocks are undervalued or overvalued (Damodaran 2012).

In academic publications, there is frequent discussion on improving stock valuation models through fundamental analysis (Wafi et al. 2015). The study conducted by Mensah et al. in 2022 concluded with an analysis of how intrinsic stock valuation impacts investment decisions, along with an exploration of other theoretical components of fundamental analysis.

However, studies like Chen and Lins (2013) also address the relationship between raw material prices, such as gold, and the performance of related stocks.

Some studies, like Kisti et al. (2024), examine the application of the value at risk to manage market risks associated with investing in raw material company stocks.

Additional research by Mestanza-Ramón et al. 2022a indicates that the country has chosen to encourage the growth of its mining industry and attract investment in this sector, recognising its substantial potential in gold, silver, and copper mining. A different study from the same authors, Mestanza-Ramón et al. (2022b), also discusses Ecuador's mining potential and provides more detail on its history and the start of large-scale mining through foreign mining companies.

Reviewing the existing literature revealed that the focus is often on the theoretical aspects of fundamental analysis and stock valuation. During the research process, the authors did not find any work explicitly dealing with the intrinsic value of the stocks of specific companies engaged in mining activities in Ecuador.

The authors of this article focus on five of the most significant Ecuadorian mining companies: Silvercorp Metals Inc., Lundin Gold, Inc., Anglo American plc, BHP Group Limited, and Dundee Precious Metals, Inc. By utilising a variety of intrinsic value models, including dividend discount models, earnings models, and cash flow models, this study offers a unique and multifaceted perspective on investment opportunities in this growing sector.

Furthermore, it fills a gap in the existing literature by specifically examining the intrinsic value calculations for mining stocks in Ecuador, which have not been concluded in previous research. The discussion around Ecuador's mining sector also highlights the strategic significance of sustainable practices and renewable technologies, which align with global shifts towards green energy solutions.

The comprehensiveness of the issue led to the formulation of two main objectives of our article.

First, it aims to assess the economic potential of Ecuador's mining sector through a combined quantitative and qualitative analysis, identifying both the current state and future prospects of the industry. It involves evaluating economic indicators such as GDP contributions, export revenues, and investment trends, along with a detailed examination of Ecuador's mining policies and regulatory environment. Data were sourced from government publications, industry reports, and academic resources to provide a comprehensive view of the sector.

Second, the study aims to calculate the intrinsic value of five selected mining companies with operations in Ecuador. By comparing the intrinsic value with current market prices, the study aims to identify potentially undervalued stocks, offering investment recommendations based on results and valuation insights. The conclusion highlights potential investment opportunities in these mining companies' stocks based on their intrinsic value and unique potential for mining in the country.

At the beginning of the research, the authors formulated the following hypotheses, which form the foundational framework of this study:

- Hypothesis 1: Ecuador's mining sector has significant untapped economic potential;
- Hypothesis 2: The stocks of the companies mining there are undervalued based on their intrinsic value calculation, creating an attractive opportunity for long-term investors.

2 METHODOLOGY

The methodology is divided into three main parts. The first part is data. The second part examines the economic potential of Ecuador's mining sector. The third part determines the companies and the intrinsic value of mining company stocks to assess undervaluation, overvaluation, and investment opportunities in this sector. All financial estimates and intrinsic value calculations presented in this study reflect market conditions as of December 31, 2023.

2.1. DATA

Data were primarily collected from local government/ministry publications/reports/plans such as (Ministry of Energy and Non-Renewable Natural Resources 2020; CEDATOS 2024; Regulation and Control Agency for Energy and Non-Renewable Natural Resources, n.d.), industry reports (International Trade Administration 2024; Global Americans 2022; AX, LEGAL 2023; Adventus Mining 2024; BHP 2021; Titan Minerals 2023). Relevant international journals articles on Ecuador's mining such as

(Mestanza-Ramón et al. 2022a; Mestanza-Ramón et al. 2022b; Mariño et al. 2022; Dias and Carvalho 2020; Carrillo-Maldonado et al. 2024; Fikru et al. 2024). The data collection on Ecuador's mining industry also included information from the Banco Central del Ecuador 2021 and the websites of Ecuadorian companies that are the subject of this article. This literature-based method and others provided comprehensive background information on Ecuador's current mining projects, investment levels, and sector-specific economic indicators.

The data used to calculate the intrinsic value of the stock was sourced from publicly accessible materials, particularly from the financial reports and investor relations sections on the websites of the monitored companies and the central bank. This includes information from Banco Central del Ecuador (2021), Silvercorp Metals (2024), Lundin Gold (2024), Anglo American (2024), BHP (2024), Dundee Precious Metals, Inc. (2024), current to 31.12.2023. These and other data from (TRADING ECONOMICS 2024; Stock Analysis on Net 2024) encompassed information such as the current stock price, dividend yield, EBITDA for the last 12 months, net income, number of outstanding shares, debt level, and cash flow. All the referenced metrics were expressed in dollars since this currency is commonly used in the markets where these companies are listed.

2.2. METHODOLOGY FOR EVALUATING ECUADOR'S MINING POTENTIAL

Secondary data analysis was essential to establishing key indicators of mining sector growth and investment opportunities in Ecuador. Various statistical data (mentioned from sources of Chapter 3.1), such as export revenue, GDP from mining, mineral extraction, and foreign investment trends, were examined to determine the sector's impact on the national economy.

In order to project future trends and assess investment potential, the study also reviewed Ecuador's national mining development plans and reports on geochemical exploration (Ministry of Energy and Non-Renewable Natural Resources 2020; CEDATOS 2024; Regulation and Control Agency for Energy and Non-Renewable Natural Resources). This examination provided insights into the anticipated impact of sustainable practices and government regulation on the sector's expansion. Predictive analyses were derived from past and current data trends, offering a forward-looking assessment of potential revenue growth, sector contributions to GDP, and employment prospects up to 2030.

Based on the results and discussion, the conclusion presents a clearly defined summary supported by a comparative table, which synthesizes key indicators and provides a simplified overview of the current situation along with a forecast of future developments derived from both quantitative and qualitative methods.

This table synthesises major economic indicators such as operational mining pro-

jects, contributions to GDP, foreign investment trends, and social impacts, presenting a clear snapshot of both the current situation and future outlook.

2.3. METHODOLOGY OF SELECTED COMPANIES

The companies subject to the study are five major publicly traded mining companies in Ecuador. These companies were selected explicitly for having the highest market capitalisation in the country (as determined by information on each company's website, calculated from the number of issued shares and current stock price), their history of dividend payments, and their active involvement in Ecuadorian mining, whether through direct operations, project investments, or exploration phases. Publicly accessible data are available, and their quantity constitutes a representative sample suitable for applying various intrinsic value models. The companies, along with their mining activities in Ecuador, are:

- Silvercorp Metals is advancing its El Domo-Curipamba and Condor projects in Ecuador, having obtained the final construction permits in August 2024, which moves the project into the Exploitation Phase. This development will commence copper-gold mining operations, representing a major step forward for medium-scale mining in Ecuador (Silvercorp Metals 2024).
- Lundin Gold's Fruta del Norte, a high-grade underground gold mine in southeast Ecuador, holds probable reserves of 5.02 million ounces of gold at 8.7 g/t. The project began commercial production in 2019 and is expected to produce 340,000 ounces annually over its 13-year life (Lundin Gold 2024).
- Anglo American is actively exploring the Pegasus gold-copper project in Ecuador through a joint venture with Luminex Resources. Since 2018, Anglo has invested $26 million and drilled 1,800 meters, focusing on several promising targets in the Pegasus concessions (Mining 2021)
- BHP has partnered with Luminex Resources on the Tarqui copper exploration project in Ecuador's Gualaquiza canton, located in the southern Amazon region. Through this partnership, BHP is working on early-stage exploration activities to assess the area's copper potential (BHP 2021)
- Dundee Precious Metals Inc., the Loma Larga project, fully owned by Dundee Precious Metals in Ecuador's Azuay province, is in the permitting stage. It is expected to yield around 200,000 ounces of gold each year during its initial five years. Throughout the project's development, DPM is focusing on sustainability and actively engaging with the community (Dundee Precious Metals 2021b).

The map (Fig. 1) shows areas where BHP, Silvercorp Metals, Dundee Precious Metals, Lundin Gold, and Anglo American have mining operations, exploration projects, or investment interests in Ecuador. While most sites correspond to exploration or early-stage development, Lundin Gold is actively mining at Fruta del

Norte. Several companies are involved through partnerships or joint ventures. The locations represent zones of strategic activity and interest, not precise mining coordinates.

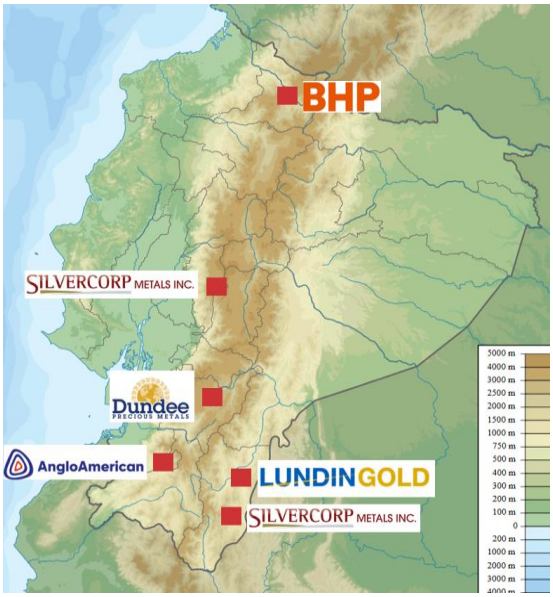

Fig. 1. Locations of companies investments, exploration projects, and mining operations in Ecuador. Source: own processing based on mining company operation in Ecuador

2.4. THEORETICAL MODELS AND METHODOLOGY FOR ASSESSING INTRINSIC STOCK VALUE

The conclusion for corporate fundamental analysis is based on the intrinsic value of the stocks. This area of research focuses on calculating the intrinsic value of the stock according to models from relevant literature (Pinto 2020; Koller 2020; Damodaran 2012). The calculation was conducted using the Dividend Discount Models (DDM), Earning Models (EM), and cash flow models (CFM). The calculation was conducted using the Dividend Discount Models (DDM), Earning Models (EM), and cash flow models (CFM).

Dividend discount models

Dividend discount model with zero growth:

$$VHa = \frac{D0}{rd}. \tag{1}$$

Single-stage dividend discount model with infinite holding period:

$$VHa = \frac{D0*(1+g)}{(1+rd)} + \frac{D0*(1+g)^2}{(1+rd)^2} + ... + \frac{D0*(1+g)^n}{(1+rd)^n}. \quad (2)$$

Gordons dividend discount model:

$$VHa = \frac{D0*(1+g)}{(1+rd)}. \quad (3)$$

Earning models

Zero growth earning model:

$$VHa = E0*\frac{VP0}{rd}. \quad (4)$$

Constant growth earning model:

$$VHa = E1*\frac{VPf}{(rd-g)}. \quad (5)$$

Earning model focused on financial metrics:

$$VHa = PE*(1+rd)*\frac{NP}{NS}. \quad (6)$$

Cash flow models

Free cash flow to equity (FCFE):

$$VHa = \frac{\frac{FCFE_1}{k-gFCFE} + \frac{Rd*D_1*T}{rb} - L}{\text{number of shares issues}}. \quad (7)$$

Single stage model with constant growth:

$$VHa = \frac{\frac{FCFE_1}{GFCFE-k}}{NS}. \quad (8)$$

where:

VHa – intrinsic value of stocks,
*D*0 – discount rate (required rate of return),
rd – discount rate (required constant rate of return),
g – expected annual earnings growth rate per share,

$E0$ – net annual earnings per share in the initial year,
$VP0$ – dividend payout ratio = $D0/E0$, rd – discount rate (required constant rate of
$E1$ – net annual earnings per share in the future year,
VPf – fixed dividend payout ratio in individual years ($f = t = 0, 1, \ldots, n$),
PE – price-to-earnings ratio,
NP – net profit,
NS – number of shares issued (Pinto 2020; Koller 2020; Damodaran 2012).
CFM models:
L – total liabilities,
$D1 = L$ – total liabilities in the first year,
T – company tax rate,
Rb – borrowing interest rate,
$FCFE1$ – expected free cash flow to equity in the following year,
k – required rate of return,
$GFCFE – FCFE$ growth rate,
(Pinto 2020; Koller 2020; Damodaran 2012).

By calculating individual formulas, we obtained the intrinsic value of the stock for each company and formula. Subsequently, the average of the results of individual formulas within each area (DDM, EM, CFM) is determined.

The average result from the DDM, EM, and CFM formulas is compared with the company's share price as of December 31, 2023, converted to USD if in a different currency. The percentage difference between the intrinsic value and the current stock price is calculated to determine valuation. If the result is below 1.00, it suggests the stock is overvalued; if it is above, it indicates undervaluation. The greater the result exceeds 1.00, the more positive the valuation.

Mining companies, considered for potential investment, are ranked according to the weighted average results of all formula groups and their percentage differences. The highest value indicates the most favourable investment opportunity. If the stock's intrinsic value is undervalued, investing is recommended. The resulting ranking of companies based on the intrinsic value of stocks also serves as a comparison among the companies.

3 RESULTS AND DISCUSSION

The findings presented in this study (Table 1) confirm the rapidly evolving role of Ecuador's mining sector as a key contributor to national economic growth and a strategically significant player in the global raw materials market.

While only 10% of Ecuador's territory has been explored geologically, large-scale deposits have already been confirmed, which aligns with the assessments by Mestanza-Ramón et al. (2022a), who emphasize Ecuador's considerable geological promise

in copper and gold. New projects such as Cascabel and Curipamba, initiated in 2024, represent a shift toward a more diversified and industrialized mining economy and are expected to significantly increase Ecuador's share of Latin American mineral output. The growing number of operational and near-operational projects, including Fruta del Norte, Mirador, and San Carlos Panantza, suggests an ongoing transition from exploratory to production phases, indicating rising investor confidence and improved project readiness across the sector.

Table 1. Summary of Ecuador's mining potential.
Source: based on findings in empirical results

Indicator	Current situation	Future outlook
Mining potential	Ecuador has significant untapped mining potential, with only 10% of the country explored and already containing large deposits of raw materials.	New projects like Cascabel and Curipamba started in 2024 are expected to boost production and expand exploration in near future
Operational large-scale mines	Fruta del Norte and Mirador	Additional projects (Llumiragua, San Carlos Panantza, Cangrejos, Warintza, Loma Larga, etc.) are progressing, leading to increased output.
Mining exports	Mining exports in Ecuador have been steadily increasing, reaching USD 2,775 million in 2022, up from USD 2,091 million in 2021. This accounted for 8.5% of total exports in 2022.	Mining exports are projected to exceed USD 4 billion by 2025, potentially contributing 15% of total exports.
Economic contribution	The mining sector created 180,000 jobs and contributed USD 590 million in taxes and royalties in 2022.	The sector is expected to generate increased fiscal revenues and employment as more large-scale projects become operational.
Foreign investment	Foreign investments in mining reached USD 774 million in 2018, a 1,029% increase from 2017. In the third quarter of 2023, investments in mining projects across various regions of Ecuador reached a total of USD 204.68 million.	Significant foreign investments are expected to continue as interest in Ecuador's untapped resources remains strong.
Contribution to GDP	Mining accounted for 1.6% of Ecuador's GDP in 2017.	The contribution is expected to rise annually until at least 2030 as large-scale projects expand.
Government development plan	Focus on responsible and regulated mining to enhance transparency and sustainability.	Enhanced oversight, collaboration with communities, and focus on sustainable mining practices.

Illegal mining and crime	Linked to organised crime, including violence, environmental damage, and human rights violations.	Strengthened efforts from the government and regulatory bodies to combat illegal mining and its associated issues.

Table 1 continued

Social impacts of mining	Mining affects vulnerable populations, leading to insecurity and environmental degradation in some areas.	Government control operations and company efforts are expected to address these issues, improving security and social stability.
Critical raw material	Critical raw materials are essential as controlling their supply chains provides strategic and economic leverage in global industries.	Critical raw materials are mined in Ecuador alongside major deposits of gold and silver.

The operational expansion beyond Fruta del Norte and Mirador into projects such as Warintza, San Carlos Panantza, and Loma Larga further confirms the sector's positive trajectory. Empirical evidence from Fruta del Norte has shown considerable regional development impacts, including employment growth and local economic stimulation (Carrillo-Maldonado et al. 2024). If this pattern continues, other emerging projects may replicate similar socioeconomic benefits, particularly in underdeveloped provinces. However, regulatory, environmental, and community-related challenges remain key risks to the timely implementation of these operations (Global Americans, 2022), requiring coordinated action between government agencies and private stakeholders.

The economic relevance of the sector is reflected in the rising contribution of mining to export revenues and fiscal income. In 2022, the sector contributed USD 590 million in taxes and royalties and created 180,000 jobs (AX Legal 2023). If projections materialize, mining could account for over 15% of Ecuador's total exports by 2025 (Banco Central del Ecuador 2021). Foreign direct investment remains robust, with USD 204.68 million in Q3 2023 alone, supported by global investor interest in Ecuador's unexplored geological zones (Lundin Gold 2024; Anglo American 2024). Nevertheless, external macroeconomic factors, such as commodity price volatility and inflation may influence capital flows and limit short-term stability in sectoral growth (Blokhin 2022; Fry-McKibbin and McKinnon 2023),

In the broader context of the global green transition, Ecuador's ability to sustainably and inclusively manage its copper resources will be critical for domestic development and international strategic relevance, particularly as copper remains a foundational input in low-carbon technologies (Su et al. 2024).

This section presents the intrinsic value estimates of selected mining companies. It should be noted that all valuations and analyses correspond to the market context as of December 31, 2023.

The stock prices of Silvercorp Metals Inc. and BHP were already listed in USD, as both companies are traded in U.S. dollars. For Lundin Gold and Dundee Precious Metals, stocks are in Canadian dollars were converted using the exchange rates as of December 31, 2023, specifically, 16.54 CAD equaled 12.02 USD for Lundin Gold, and 8.42 CAD equaled 6.12 USD for Dundee Precious Metals. For Anglo American, the share price of 1933 GBX (British pence) was converted to 25.08 USD based on the exchange rate on the same date.

Table 2. Calculating the intrinsic value of a stock using Dividend Discount Models (DDM). Source: based on the results of DDM formulas

Calculating the intrinsic value of a stock using Dividend Discount Models (DDM)						
Company	Stock price 31/12/2023 (USD)	DDM with zero growth (USD)	S-S DDM with infinite holding period (USD)	Gordons DDM (USD)	DDM average (USD)	Difference, %
Silvercorp Metals, Inc.	2.63	0.50	2.33	0.59	1.14	43
Lundin Gold, Inc.	12.02	10.80	12.34	12.66	11.93	99
Anglo American plc	25.08	25.80	26.40	30.24	27.48	110
BHP Group Limited	68.33	58.40	41.18	68.46	56.01	82
Dundee Precious Metals, Inc.	6.12	3.20	5.82	3.75	4.26	70

Table 2 presents the results of the DDM applied to the selected companies, calculated using the previously mentioned formulas.

To compute, we require the anticipated yield rate, at the commencement of the investment, typically considered realistic and satisfactory at 10%, as employed during the calculation here (Pinto 2020; Koller 2020). The expected annual stock profit rate in the DDM calculation is set to exceed the predicted inflation in relevant zones such as the EU (European Commission 2024b) and the USA (TRADING ECONOMICS 2024) for the subsequent year, namely 5.5%.

The differences in the results of the DDM models can be attributed to varying dividend policies, assumptions about growth rates, and the discount rate applied. These models are susceptible to dividend levels, as seen with Anglo American, where high payouts lead to undervaluation indications. Conversely, companies with lower dividends, like Silvercorp Metals, BHP and Dundee Precious Metals, appear overvalued. Moreover, market prices take into account factors beyond just dividends, including growth potential, economic conditions, and market sentiment, which are not reflected

in DDMs. It highlights the challenge of relying solely on DDMs for valuation and suggests integrating other valuation methods for a comprehensive assessment (Pinto 2020; Koller 2020).

- Earning models

Table 3. Calculating the intrinsic value of a stock using earning models (EM).
Source: based on the results of EM formulas

Calculating of the intrinsic value of a stock using earnings models (EM)						
Company	Stock price 31/12/2023 (USD)	Zero growth earning model (USD)	Constant growth earning model (USD)	Earning model focused on financial metrics (USD)	EM average (USD)	Difference, %
Silvercorp Metals Inc.	2.63	0.5	0.59	2.89	1.33	50
Lundin Gold Inc.	12.02	10.8	12.66	13.22	12.23	102
Anglo American plc	25.08	25.8	30.24	27.59	27.88	111
BHP Group, Limited	68.33	58.40	68.46	75.16	67.34	0,99
Dundee Precious Metals Inc.	6.12	3.2	3.75	6.73	4.56	75

Table 3 displays the intrinsic value of stocks calculated using earnings models. The yield rate is set similarly to the discount rate used in the dividend discount model, with a rate of 10% and a required stock yield of 5.5%. This setup follows the same principles outlined previously. The results from the earnings models reveal a trend comparable to that of the dividend discount model.

According to earnings model results Anglo American, and Lundin Gold stocks are undervalued by 11%, and 2%, respectively, indicating that Anglo American offers the most attractive investment opportunity. BHP is correctly valued, with an indicated slight overvaluation of approximatel 1%. In contrast, Silvercorp Metals Inc. and Dundee Precious Metals are overvalued by 50% and 25%.

The differences in the results of the earnings models can be attributed to the diverse financial characteristics and market conditions affecting each company. Metrics such as EBITDA, share issuance, and dividend policies significantly shape the intrinsic value estimations, making these models highly sensitive to variations in these inputs. For instance, companies like Lundin Gold and Anglo-American exhibit strong

financial performance and stable growth, which supports their undervaluation according to the models. In contrast, Silvercorp Metals and Dundee Precious Metals are overvalued, likely due to lower earnings relative to their market prices or external factors such as regulatory changes, commodity price fluctuations, and competitive pressures. These findings emphasise the importance of considering each company's unique financial and operational circumstances when interpreting earnings model results (Blokhin 2022).

Additionally, earnings models are influenced by broader economic and industry-specific dynamics, which can introduce significant variability in the outcomes. Factors like economic deflation, evolving regulations, the demand for commodities in the market, and shifting consumer preferences have a direct effect on EBITDA and, therefore, the model calculations. The reliance on these external variables underscores the limitations of earnings models in isolation, as they may not fully capture the broader context of market sentiment or long-term growth potential. This variability highlights the necessity of integrating earnings models with complementary valuation approaches to provide a more comprehensive and nuanced assessment of intrinsic stock values, particularly in industries as volatile as mining (Blokhin 2022).

- Cash flow models

Table 4. Calculating the intrinsic value of a stock using cash flow models (CFM). Source: based on the results of CFM formulas

Calculating the intrinsic value of a stock using cash flow models (CFM)					
Company	Stock price 31/12/2023 (USD)	Free cash flow to equity (USD)	Single stage model with const. Growth (USD)	CFM average (USD)	Difference, %
Silvercorp Metals Inc.	2.63	1.32	1.84	1.58	60
Lundin Gold Inc.	12.02	12.39	14.06	13.23	110
Anglo American plc	25.08	14.90	26.13	20.51	82
BHP Group, Limited	68.33	27.40	44.14	35.77	52
Dundee Precious Metals Inc.	6.12	11.87	12.85	12.36	202

Table 4 displays two cash flow models, their average values, and the deviation from their current stock prices, indicating whether they are undervalued or overvalued.

Mondello (2023) examines free cash flow models and finds that they are conceptually sound and suitable for most equity valuation applications. The authors of the Study (Moyo 2024) explore firm and equity valuation using free cash flow to equity, con-

cluding that discounting the FCFF yields the firm's present value, while discounting the FCFE provides the present value of its equity. This approach, discounted cash flow (DCF) valuation, is widely used in valuation practice.

It is important to note that Lundin Gold and Anglo American used the FCF for their calculations, as FCFE data is not publicly available. Other companies used the FCFE.

As the name suggests, cash flow models are primarily influenced by FCFE, but also by factors such as the company's debt level and the number of shares issued. Accurate calculations require precise data, correct financial metrics and a solid understanding of the economic and industry context.

Table 5 shows the average intrinsic stock value and the percentage difference from the stock price. Figure 2 illustrates the results graphically.

Dundee Precious Metals Inc., Anglo American plc, and Lundin Gold Inc. show undervaluation of 4%, 3%, and 3%, respectively.

Table 5. Summary of the intrinsic value of stocks.
Source: based on the results of applied formulas

Summary of the intrinsic value of stocks						
Company	Stock price 31/12/2023 (USD)	DDM (USD)	EM (USD)	CFM (USD)	Average of the intrinsic stock value (USD)	Difference, %
Silvercorp Metals Inc.	2.63	1.14	1.33	1.58	1.32	50
Lundin Gold Inc.	12.02	11.93	12.23	13.23	12.37	103
Anglo American plc	25.08	27.48	27.88	20.51	25.9	103
BHP Group, Limited	68.33	56.01	67.34	35.77	55.20	81
Dundee Precious Metals Inc.	6.12	4.26	4.56	12.11	6.33	104

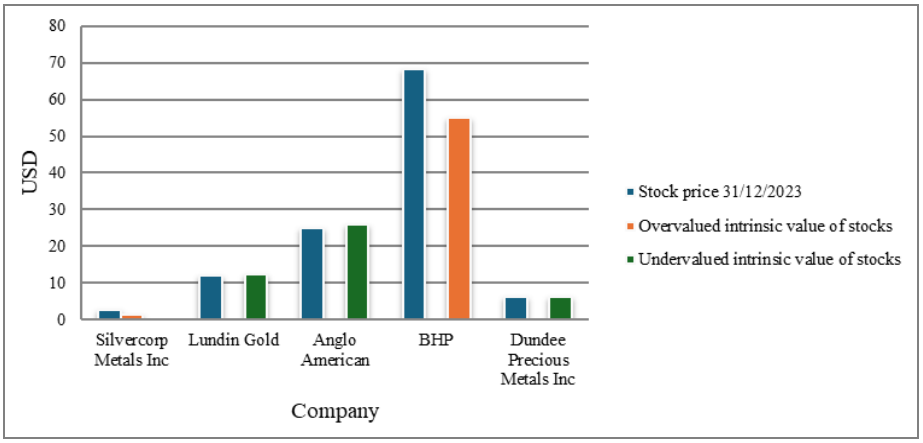

Fig. 2. Stock price of 31.12.2023 vs. average intrinsic value of stocks of all models.
Source: based on the results of applied formulas

The findings and investment insights are based solely on data available as of December 31, 2023, and may not apply to subsequent developments.

These results suggest that these companies might offer promising investment potential, especially considering their recent involvement in Ecuador's mining sector. Ecuador has recently been known for its vast, untapped resources, further enhancing these companies' long-term growth prospects.

In contrast, Silvercorp Metals Inc. and BHP shows a substantial overvaluation of 50%. Its stock price of USD 2.63 significantly exceeds the average intrinsic value of USD 1.32. respectively 18% an 68.33 USD, 55.2 USD for BHP. This result suggests that the company's stock might pose a higher investment risk compared to its peers.

The observed results of the intrinsic stock valuations are influenced by various factors, primarily driven by the companies' underlying financial metrics and operational characteristics. For example, Anglo American significant undervaluation is likely due to its strong dividend policy, earnings, and cash flow generation, aligning with its established global presence and diversified operations. Similarly, the undervaluation of Dundee Precious Metals and Lundin Gold reflects their potential for future growth, bolstered by their recent involvement in Ecuador's mining sector and the country's untapped resource base. These factors indicate promising long-term investment prospects.

In contrast, the overvaluation of Silvercorp Metals, Inc., an BHP suggests potential misalignment between its current market price and its financial fundamentals. It could be due to lower earnings, less effective cash flow generation, or increased market speculation raising its price. Furthermore, companies that are still in the exploration or development stages, like those operating in Ecuador, encounter considerable uncer-

tainties. Predicting the full realisation of their potential is challenging due to factors such as operational delays, regulatory hurdles, or fluctuating commodity prices. These uncertainties can result in discrepancies between intrinsic value calculations and market valuations.

Discussing these results is inherently complex, as many influencing factors such as global commodity demand, geopolitical risks, or future regulatory changes are difficult to forecast. For example, commodity price volatility could significantly alter cash flow models, while shifts in government policies might impact operating costs or access to resources. Similarly, changes in exchange rates could either benefit or hinder profitability, depending on the company's geographic exposure. These unpredictable elements underscore the limitations of valuation models in isolation and the importance of incorporating qualitative analysis and market trends to complement quantitative assessments. Future studies should investigate dynamic modelling techniques or conduct sensitivity analyses to address these uncertainties more effectively and offer flexible valuation insights.

It is important to note that many of these companies are still in the exploration and development phases of their mining operations, which may not yet fully reflect their potential. However, Ecuador's promising mining potential remains a strong factor supporting the attractiveness of these investments.

5 CONCLUSIONS

This study evaluated Ecuador's investment potential in the mining sector and conducted an intrinsic stock valuation for companies engaged in mining activities within the country. By combining quantitative and qualitative data, the research has highlighted Ecuador's significant investment opportunities in mining stocks, especially those that are undervalued according to intrinsic value calculations.

The findings of this research confirm both hypotheses. Ecuador's mining sector has significant untapped economic potential, with vast reserves of minerals like gold, silver, and copper and only 10% of its territory explored. Large-scale mining projects, such as Fruta del Norte, Mirador, Cascabel, and Curipamba, drive economic growth through exports, job creation, and increased foreign investments, establishing Ecuador as a key player in the global mining sector.

Ecuador presents a compelling economic opportunity in mining, supported by its abundant resources, expanding industry, and future outlook indicators such as mining exports, contributions to GDP, foreign investment, geochemical exploration, and efforts to control illegal mining. By addressing challenges like illegal mining and social impacts, the country enhances its appeal as a destination for long-term investments, creating favourable conditions for investors and further development.

To address the research questions and second hypothesis, the authors calculated the intrinsic stock values of five public companies with mining operations or investments in the mining sector in Ecuador. The results of the calculation revealed that some companies have undervalued stocks by using the Dividend Discount Models (DDM), earnings models (EM), and cash flow models (CFM). The findings indicate that Dundee Precious Metals, Lundin Gold, and Anglo-American show undervaluation, with undervaluation percentages of 4%, 3%, and 3%, respectively. Although the undervaluation in three of these companies is relatively modest, the positive outlook for Ecuador's mining potential still suggests a highly favourable investment environment for these stocks. Conversely, BHP and Silvercorp Metals are identified as overvalued by approximately 18% and 50%, making it a less favourable option for investors.

It should be noted that all valuations and analyses correspond to the market context as of December 31, 2023. Combined with Ecuador's rich resource base and the growing global demand for critical raw materials, the country's mining sector offers strong investment potential, aligning with the research question.

ACKNOWLEDGEMENT

The authors would like to express their gratitude to the Student Grand Competition of the Faculty of Mining and Geology VSB-TUO, No. SP2024/050, for their encouragement and financial support. This paper was created as part of the project The European Just Transition Fund supported this work within the Operational Programme Just Transition under the aegis of the Ministry of the Environment of the Czech Republic, project CirkArena, number CZ.10.03.01/00/22_003/0000045.

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