Valuation of Canadian Closed-End Funds

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Abstract

This paper examines the market discounts on closed-end funds currently traded on the Toronto Stock Exchange (TSX) based on those discussed in Burton G. Malkiel's article "The Valuation of Closed-End Investment Company Shares." The main objective is to describe if discounts of closed-end companies listed in the TSX can be supported by the postulates suggested by Malkiel in his study. Additionally, this study describes fund characteristics to inform the average investor about alternatives available in the TSX. The analysis reveals that closed-end funds in Canada do not consistently trade at discounts. Therefore, Malkiel's postulates are partially true compared to the Canadian market. The results were obtained by analyzing the top 10 closed-end funds characteristics by volume traded between 2019 and 2023.

Table of Contents

Definitions

TSX: Toronto Stock Exchange

NYSE: New York Stock Exchange

NAV: Net Asset Value

CEF: Closed-end Fund

PHYS: Sprott Physical Gold Trust

CYB: Cymbria Corporation

EIT: Canoe EIT Income Fund

ENS: E Split Corporation

DGS: Dividend Growth Split Corporation

LBS: Life & Bank Split Corporation

GDV: Global Dividend Growth Split Corporation

SBC: Brompton Split Banc Corporation

US: United States

CAD: Canadian Dollar

USD: United States Dollar

M&A: Merges and Acquisitions

MER: Management Expense Ratio

Introduction

Closed-end funds (CEF) offer benefits for investors; they can be a profitable option as a long-term investment without necessarily having to maintain high levels of liquidity. Therefore, financial academics constantly debate and study them by examining their relevance and operation. In this regard, Malkiel (1977) postulates that in the markets, the CEFs are traded at discount prices, with values lower than those of their respective NAV.

The general objective of this study is to analyze whether closed-end funds on the TSX are consistently traded at discount prices as described in Malkiel's work and if this hypothesis can apply to the context of the Canadian financial market. Likewise, we want to recognize if additional factors influence the price of closed-end funds in Canada. One of the postulates is that investors give importance to a fund's performance when assigning discounts.

This research collects and analyzes the top 10 closed-end funds concerning their daily trading values from 2019-2023 to achieve these objectives. This research is important to provide extensive information that will allow a more precise understanding of the factors that influence the listed value of CEFs, allowing investors to make better decisions.

Furthermore, academically, it presents an empirical advance by providing tangible evidence of the theoretical postulates discussed about the CEF. This is a valuable contribution to the financial world on a professional level.

Closed-End Funds

Closed-end funds are investment companies that raise capital through an initial public offering. The amount of capital, the destination of resources, and the rules governing the fund are

fixed unless shareholders agree to modify them. Instead of open-end and mutual funds, closed-end funds do not offer new shares or redeem the outstanding units. (BlackRock, 2024).

This configuration allows closed-end funds to invest in long-term assets without struggling with liquidity. Portfolios of CEF include securities listed in public exchanges, but they can also hold stakes in private equity, real estate, and physical assets. (Nuveen, 2024)

After raising capital and investing the proceeds in a portfolio, the shares or units are traded on a stock exchange, which investors can buy and sell without interfering in the fund's capital pool. The price of shares in the secondary market is affected by internal and external forces as any security. Supply and demand, market conditions, economic cycles, and the fund itself play a role in pricing (Pimco, 2024). Investors will grant higher prices than NAV to well-managed closed investment companies and penalize those not giving the expected return.

Dividend Payments are not always available within closed-end funds, as with equity investment. Payouts are not guaranteed and are subject to shareholders' approval. However, some funds provide a constant flow of dividends, while others focus on asset appreciation with no payments.

Closed-end funds face different types of fees. Management fees go directly to the administrator and are measured as Management Expense Ratio MER. It is calculated as a percentage of Assets Under Management AUM. On the other hand, funds face Trading fees, which are generated once the portfolio adds or sells securities; these proceeds go to third-party companies that offer services to the fund. The fund can not avoid paying these fees, but lower trading expenses indicate management efficiency.

Other fees the fund faces are distribution costs, legal expenses, and interest. They are operative expenses necessary for the fund's correct function (RBC, 2016). All fees are

detrimental to shareholders, and management needs to control outflows to guarantee Net Asset Value growth.

Malkiel Pricing Fundamentals

The article by Burton G. Malkiel (1977) examines the behaviour of closed-end investment companies through an empirical analysis of 24 closed investment funds between the years 1967 to 1974 in public markets in the United States. These companies don't sell or buy units directly to investors; therefore, they need to trade them in the secondary market. What draws Malkiel's attention is that the shares of this type of company usually sell at a lower value compared to the net asset value of their assets. This contradicts the efficient markets theory that all shares usually reflect the value of the assets.

The author proposes reasons for this discrepancy. First are unrealized capital gains, which are present when the price of shares rises without producing real profits. New investors who buy shares under these conditions are liable for any real profit that the fund executes after they buy, which decreases investors' expected return, resulting in a lower price to NAV. Furthermore, discounts on the value of the shares are related to distribution policies. Some of these companies choose to distribute large amounts of money to investors, this is a sign of the fund's liquidity and proof of the management's ability to make actual profits. Therefore, funds with a record of payouts are preferred by investors by assigning lower discounts and vice versa.

Another reason is foreign markets, where the shares of companies with holdings in foreign markets can make the purchase or sale of shares subject to the conditions of the exchange

market and the applicable regulations. Whether the conditions are favorable or not, the discount price is assigned. One more reason is the returns on shares of closed-end funds explain discounts, given the hypothesis of efficient markets, the value of the share should reflect its fair price. If returns are not sustainable over time, the stock price may not reflect the value of the assets and a discount is assigned.

On the other hand, sometimes the conditions and assets of the stock are not entirely clear to investors; for this reason, prices are reduced so that they continue to be attractive despite the considerable uncertainty. Malkiel relates the previous statement with funds holding Letter Stock as they may not reflect their fair price on the Net Asset value, and the market penalizes this discrepancy. Finally, portfolio rotation implies higher taxes and transaction costs, so the share price must take this into account and be quoted at a discount to reflect the additional costs, when setting the value of shares, these additional expenses must be taken into consideration. Finally, the commissions that management charges is detrimental to stakeholders therefore the higher the fees a fund perceives the higher is the discount that investors assign in the secondary market.

Further Studies

Burton Gordon Malkiel analyzed the discount between these securities' market price and NAV. According to the author, this generates a market imperfection in the valuation of capital assets. Some of the principles on the imperfection of these funds that Malkiel (1977) mentions were discussed by different authors in further studies:

Tax Liabilities

Unrealized capital gains support discounts on closed-end funds because they have the realization of capital gains taxes after purchasing the shares in these funds. However, this excludes potential tax benefits (Malkiel, 1977, pp. 847-848). Under this same idea of discounts, we find the work of Garai (2000), who mentions that, under the assumption of efficient markets, this closed-end anomaly is explained by the taxes owed on previous profits obtained by the fund, but which are assumed by the investor, (Garai, 2000, p. 45).

Additionally, Garai presents another idea that Malkiel does not mention, which has to do with the arbitrage and difficulty strategy, where it is stated: "Discounts in Closed-End Funds are greater in the case of those funds whose portfolios are more difficult to replicate, have a larger bid-ask spread, and pay lower dividends." (Garai, 2000, p. 48). The latter could be why turnover occurs or not, as Malkiel mentioned. However, this focuses on fund replication rather than on maintaining diversification.

Distributions

Another postulate is Distribution Policies. According to Malkiel (1977), these affect in the following three ways:

- It reduces unrealized appreciation, limiting future tax liabilities.
- Investors prefer regular distribution policies of generous gains compared with no distributions.
- Capital gains dividends are valued because these distributions are a part of the fund's active liquidation (Malkiel, 1977, pp. 850-851).

Under this idea of distribution, we find Charrón (2009), who reviews it from the validation of liquidity by redistributing profits since she considers that the amounts dispersed come from the accumulation of latent capital gains and the existence of liquid assets in the fund's portfolio. (Charrón, 2009, p.45). However, although Charrón agrees with the distribution postulate, other possible explanations for the anomalies of these funds are also presented.

For this, Charrón (2009) used the authors Grullon, Wang and Pontiff. The first two mentioned that discounts arise if the quality of private information in the underlying assets is better than in the open-end fund. On the other hand, Pontiff focused on the volatility of these funds compared to the performance of their underlying portfolios, demonstrating high volatility triggered by their underlying assets (Charrón, 2009, p. 55). In addition, these two authors offered a look at the impact of the assets on the investor rather than how the distribution of resources is generated.

Transaction Costs

Another study explaining the reason for the anomaly between market price and NAV was conducted by Cherkes et al. (2007). They analyzed the liquidity of closed-end funds through a mathematical proposition claiming that these funds must hold liquid assets to mitigate potential transaction costs. Investors interested in illiquid assets could get exposure by trading closed-end funds with the selected assets, causing the underlying assets not to change hands and avoiding high liquidity costs that could be translated into lower discounts. (Cherkes, 2007, p. 1).

These explanations as to why discounts and how they work in closed-end funds are tied to the future earnings or returns of the funds. Thus, Malkiel (1977) mentioned that investors pay

these discounts or premiums based on the funds' ability to produce above-average returns (Malkiel, 1977, p. 851). In other words, these discounts with which they operate are based on their ability to generate future returns.

Market inefficiencies

Restrepo (2016) is against explaining discounts or premiums from profitability. He states that discounts or premiums have short-term predictive power over the future returns of closed-end funds, given that they present a market inefficiency where the premium operates as an indicator that captures fundamental information about the different types of risks the investor faces (Restrepo, 2016, p. 3). This latest research highlights two things that are different from Malkiel's. Restrepo agrees with Malkiel about the predictive power of discounts but states that they are valid in the short term. In addition, predictability is achieved primarily on the market price rather than net asset value.

Research Gap

Overall, these studies discuss the nature of discounts by the role of market imperfections, investor behaviour, and the intrinsic characteristics of funds. Closed-end companies are constantly evolving in financial markets, and market participants, as well as investors, will continue to raise explanations on the matter. In recent years, there has been greater academic interest in the behaviour of CEFs, but some gaps persist that should be addressed in research and academic studies.

To begin with, much of the literature responds to the American context, and in the case of Canada, this has not been addressed in greater depth. Therefore, it is necessary to examine changes in the listed price of CEFs to determine if this influences discounts. Linked to this, it is

necessary to address how tax regulations can affect the price of CEFs. As in the Canadian case the value may be being influenced by the provisions of legislation issued by the government. Likewise, studies such as Malkiel's have defined causes for discounts to be noticeable in CEFs. However, the role of market efficiency and the influence of external variables is not recognized with certainty.

Closed-End Fund Characteristics

Our study selects securities based on their daily trading volumes. Higher liquidity enhances the reliability of future price forecasts for prospective investors (Dinh & Kwon, 2018). Therefore, we aim to evaluate discrepancies between the market price and the intrinsic value by focusing on the highest-volume closed-end funds listed on the Toronto Stock Exchange.

Table 1

Discount frequency of closed-end Companies listed on TMX

Fund	*Ticket*	*Discount Frecuency*	*Fund Type*
Sprott Physical Gold and Silver Trust	CEF	99.00%	Commodity Funds
Sprott Physical Gold Trust	PHYS.TO	95.52%	Commodity Funds
Sprott Physical Silver Trust	PSLV.TO	94.03%	Commodity Funds
Cymbria Corporation	CYB.TO	61.94%	Fund of Equities
Canoe EIT Income Fund	EIT-UN.TO	42.79%	Fund of Equities
E Split Corp.	ENS.TO	35.57%	Split Shares
Dividend Growth Split Corp.	DGS.TO	35.49%	Split Shares
Life & Banc Split Corp.	LBS.TO	26.53%	Split Shares
Global Dividend Growth Split Corp.	GDV.TO	25.21%	Split Shares
Brompton Split Banc Corp.	SBC.TO	24.46%	Split Shares

Note. The funds listed were selected based on the highest trading value and available information. Discount frequency represents the percentage of days where the fund market price traded below its NAV value. Data sourced from each fund's publicly available information and records from the TMX

Commodity Funds

Commodity Funds hold physical raw materials, their NAV, and market price changes, such as the price of the subjacent. The three funds analyzed in this category offer an advantage for investors, especially those subject to declaring taxes in the United States because they are in both markets through the NYSE and TSX. Therefore, a unique tax treatment is applied as the trust holds physical bullion instead of its peers that hold certificates and equities. Closed-end funds such as CEF, PHYS and PSLV trade at a constant discount and offer the following characteristics.

Lower tax rate

Capital gains from collectibles such as art and precious metals are set at 28%, above the long-term capital gains tax rate of (15%-20%). However, because of the nature of the funds, US investors can declare their participation in these funds as a Passive Foreign Investment Company to reduce the applicable tax rate from 28% to its corresponding long-term capital rate bracket (Lewis, 2019). Despite the tax efficiency to benefit US residents only, the discount effect extends to the Toronto trades as arbitrage opportunities may arise in case of price differences between both markets, which could be dissipated by agents with a presence in both markets (Dybvig & Ross, 1989).

Market Capitalization and turnover

Commodity funds show a constant discount over the five years analyzed, on average, commodity funds traded 96% of days at discount to their NAV. In contrast, Funds of Equities and Split Shares traded at 52% and 29%, respectively. Appendix A shows that commodity funds are the group of funds with the highest market capitalization by the end of 2023 with figures well above split shares and equity funds. Commodity funds enjoy liquidity in the market; however its turnover it’s the lowest among all categories (Appendix A)

Magnitude of discount

Table 2

Discount volatility

Symbol	*Average Discount*	*Standard Deviation*	*Type of Fund*
CEF	-3.2%	1.2%	Commodity Fund
PHYS.TO	-1.3%	0.8%	Commodity Fund
PSLV.TO	-2.3%	1.3%	Commodity Fund
CYB.TO	-0.6%	6.5%	Equity Fund
EIT-UN.TO	1.2%	2.9%	Equity Fund
DGS.TO	5.0%	11.2%	Split Shares
ENS.TO	5.4%	9.5%	Split Shares
SBC.TO	8.1%	9.4%	Split Shares
LBS.TO	9.0%	12.5%	Split Shares
GDV.TO	9.8%	12.6%	Split Shares

Note. Fund's average discount is calculated as the arithmetic mean of discount value from 2019 to 2023, favourable discounts represent market prices above NAV.

As shown in Table 2, Commodity funds have a persistent discount of around 1 to 3 percent. Additionally, the standard deviation of this category is the lowest compared with equities and split shares, meaning that investors can expect price variations in their portfolios to be influenced more significantly by changes in the subjacent price than by deviations from market and NAV value. Appendix B shows additional variables of closed-end funds analyzed with commodity funds in columns 1,2 and 7.

Equity funds

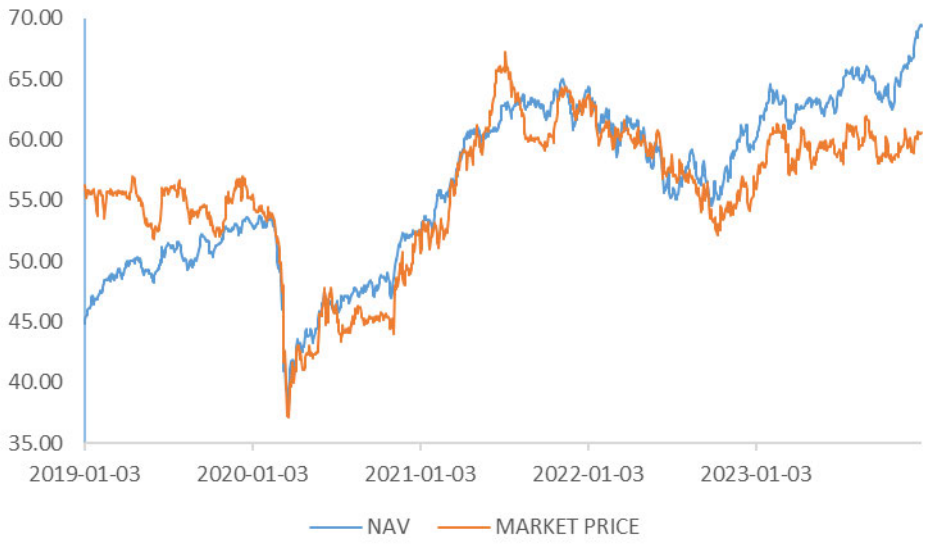
Closed-end equity funds aim to provide investors with returns through active portfolio management. The fund's net asset value and market price are derived from the variations of the portfolio holdings (Chen, 2020). This study filtered two funds based on the value traded criteria,

EIT and CYB. Despite belonging to the same category, the discount pattern differs for both vehicles. CYB traded on discount for 61% of trading days, while EIT traded 42%. Additionally, volatility for this category is higher, with more significant standard deviations than commodity funds described in Table 2.

In the case of Cambria Corporation (CYB), the difference between the fund market price and NAV per share varies over time and shows a heterogeneous behaviour. For the first three quarters of 2019, the fund traded on a premium of 10% of its NAV. With the outbreak of the pandemic and the extreme volatility, the discount narrowed until the end of the third quarter of 2022, when the market price fell behind its NAV to an average discount of 7%. The dynamic longitude of the discount does not have a constant pattern as commodity funds.

Figure 1

Market price and NAV value of CYB

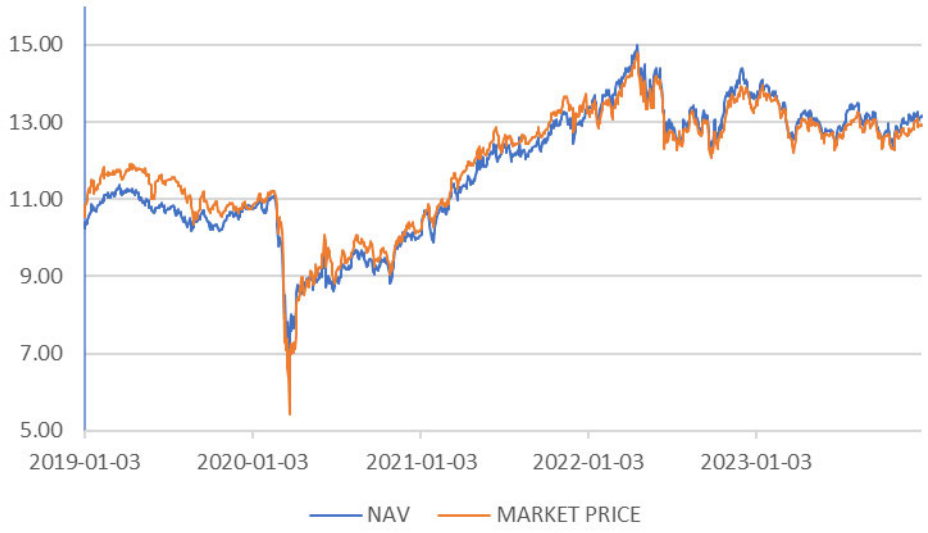


Note. The chart illustrates closing prices in the secondary market for Cymbria Corporation (CYB) in blue and its corresponding NAV for the day in orange.

On the other hand, the discount for Canoe EIT Income Fund (EIT) has a different behaviour with overall market prices at a lower discrepancy from its NAV value since the third quarter of 2019. Additionally, the fund has been trading at a close value to par since the pandemic outbreak.

Figure 2

Market price and NAV value of EIT



Note. The chart illustrates closing prices in the secondary market for Canoe EIT Income Fund (EIT) in blue and its corresponding NAV for the day in orange.

Share issuance

In the case of CYB, no additional public offerings were made after its initial IPO in 2008. In the case of EIT, there is a program where the management can issue new shares in the open market with a voluntary contribution to offset commission expenses and differences between NAV and market price. EIT announced its "at the market" equity program in 2019 for $129 million and was renewed in 2021 and 2022 for $300 and $625 million, respectively. Table 3

shows the total number of class shares or units at the end of each year, which has significantly increased since the program's introduction. The issuance of new shares is supported as the average discount is favourable among the period analyzed, as shown in Table 2

Table 3

EIT shares outstanding

Year	2023	2022	2021	2020	2019
Outstanding Class A units	176,413	158,560	144,765	121,922	118,815

Note. Shares outstanding of Class A participation for Canoe EIT Income Fund increased 48% from 2019 to 2023. Data sourced from EIT 2023 annual financial statements

Liquidity Realization- Redemptions

In the case of CYB, the fund has a repurchase policy where the management buys units in the open market if they are trading at 97% or less of their NAV value. Despite CYB being able to increase its activity in the secondary market, its discount increased from an average of -1.9% in 2022 to -7.1% in 2023. EIT does not report any unit repurchases over the period analyzed but has a redemption program for up to 10% of the outstanding units at 95% of NAV. However, only a few units were sold under the program.

Table 4

Cymbria Corporation (CYB) repurchase activity

Year	Shares Repurchased	Value
2019	0	$0
2020	40300	$1.8 M
2021	400	$0.03 M
2022	52600	$3.0 M

2023	165004	$9.8 M

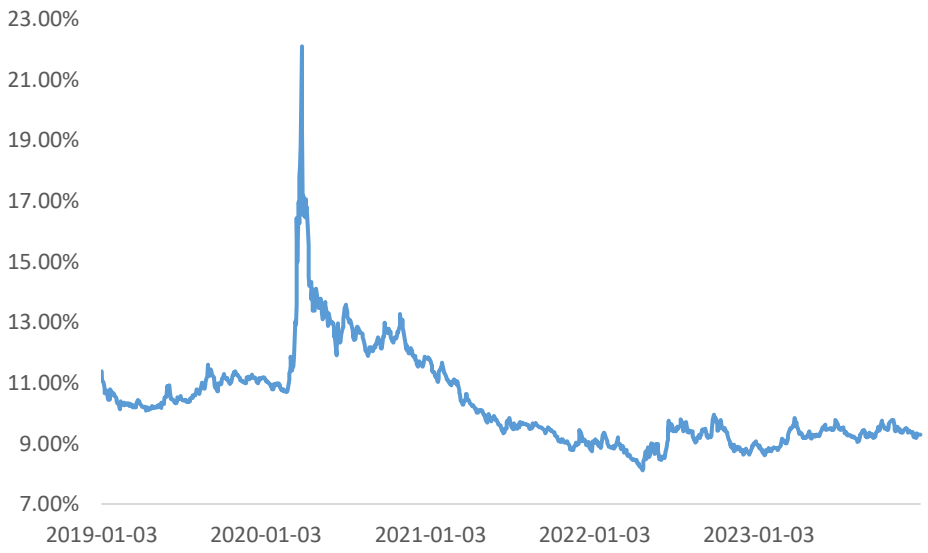
Note. Cymbria Corporation has increased its buyback program in the secondary market as discounts over NAV value increased from 2020 to 2023.

Distributions

CYB has no distribution policy, while EIT has a constant distribution policy. The fund makes monthly payments funded by portfolio dividends, capital gains, interest and return on capital. From 2019 to 2023, the fund made monthly payments with an annual payout of $1.20. for all years. The fund has not skipped any monthly payment since 2009, despite market volatility in 2020, dividend yield based on market prices shows a central value close to 10%

Figure 3

Dividend Yield EIT



Note. The total annual distribution of the Canoe EIT Income fund is CAD 1.2. Figure 3 represents the annual dividend yield considering market prices.

Capital Structure

The capital structure of both funds has a different approach to financial leverage; in the case of CYB, financial liabilities are 6.95% of the capital structure and for EIT, 4.44%. However, CYB has two types of shares, class A and J, where the first category is 64% of the capital structure and the second is 28%. In the case of EIT, the Common shares represent 87% of the capital, and series 1 and series 2 preferred shares 8% of the capital structure together. This study focuses on Class A shares for CYB and Common shares for EIT.

Split Share Corporations

The third group of funds analyzed are Split Shares Corporations, which issue capital and preferred shares. Capital shares provide price appreciation and variable dividend payments, while preferred shares provide investors with a constant flow of dividend payments (Gazzin, 2021). Capital shares are meant for investors looking for risk-reward compensation from stock investing, while preferred shares offer the equivalent benefits of fixed-income investing. This study focuses only on capital share pricing.

Discounts over NAV are not constant in the case of split shares; capital shares for the five funds analyzed are traded at a premium. As shown in Table 5, funds such as GDV and SBC traded at a higher value than their corresponding NAV in every single day of 2023.

Table 5

Split Shares positive discount frequency

Year	LBS.TO	DGS.TO	ENS.TO	SBC.TO	GDV.TO
2019	81.07%	44.03%	2.47%	100.00%	1.23%
2020	55.37%	36.78%	80.58%	78.10%	82.64%
2021	42.32%	80.08%	97.93%	16.18%	90.46%
2022	88.33%	95.83%	43.75%	83.33%	100.00%
2023	100.00%	65.00%	97.50%	100.00%	100.00%
Average	***73.42%***	***64.34%***	***64.45%***	***75.52%***	***74.87%***

Note. The table presents the percentage of days overall trading days in a year where capital shares of 5 split shares traded at a price above NAV. Values of 100% describe a year where the fund traded at a premium.

Magnitude of Discount

Table 6 considers the average discount value only for the days where split shares traded at a premium; the result shows an unclear pattern among the five funds. On the other hand, Table 7 does a similar exercise with the days where a negative discount was recorded. The minimum value among the sample is less than 10%, with most of the readings below 5%. In the case of split shares, data shows that closed-end companies trade at a premium at a higher frequency and magnitude.

Table 6

Average premium value

Year	LBS.TO	DGS.TO	ENS.TO	SBC.TO	GDV.TO
2019	7.25%	3.91%	1.91%	4.65%	1.84%
2020	34.14%	29.58%	13.59%	9.46%	6.73%
2021	2.73%	11.95%	7.59%	2.21%	5.18%
2022	15.84%	11.08%	3.87%	14.59%	22.14%
2023	16.52%	15.48%	15.40%	19.19%	21.02%

Note. Table six considers exclusively the days funds traded above their NAV value to calculate the arithmetic mean of the magnitude of discounts; therefore, all values are positive.

Table 7

Average discount value

Year	LBS.TO	DGS.TO	ENS.TO	SBC.TO	GDV.TO

2019	-1.58%	-4.02%	-4.30%	N/A	-3.64%
2020	-2.72%	-8.64%	-7.10%	-1.41%	-3.65%
2021	-2.20%	-9.41%	-0.67%	-2.58%	-2.06%
2022	-2.04%	-2.68%	-3.56%	-2.19%	N/A
2023	N/A	-5.07%	-0.47%	N/A	N/A

Note. Table seven considers exclusively the trading days where the fund market price was below its NAV and provides the arithmetic mean of the discount magnitude.

Distributions

In the case of capital shares, shareholders enjoy monthly payments if NAV is above a preestablished level and management perceives the distribution will not affect future fund performance. Table 8 shows the number of months per year with payments. In the case of split shares, the payment amount is constant over time, and payments received account for a large portion of capital return.

Table 8

Monthly dividends per year

Year	LBS.TO	DGS.TO	ENS.TO	SBC.TO	GDV.TO
2019	12	7	12	12	12
2020	4	2	12	12	12
2021	12	10	12	12	12
2022	12	10	12	12	12
2023	12	2	12	12	12

Note. Monthly distributions are counted for each fund in a particular year. The criterion for counting a monthly payment is based on its record date. A value of 12 means that the fund made monthly payments each year.

Methodology

For the research development, 10 closed-end funds, the main ones listed on the TSX, have been identified with their daily trading liquidity function from 2019 to 2023. Data related to daily market prices, NAV, MER, and each fund's distribution policy.

The dependent variable under study is the discount value of closed-end funds traded on the Toronto Stock Exchange (TSX). This is calculated by subtracting the NAV from its market price. Some of the independent variables analyzed are market prices, MER and the policy of each fund concerning its distribution.

For the development of the research, the value of the MER and the discount value are subjected to a linear regression. For this, equation 1 is formulated, which contains 3 variables: systematic risk, standard deviation, total risk, and return, and the average discount per period is calculated. This is formulated from a combination of economic theories.

Equation 1

$$AD = b_0 + Beta * x_1 + SD * x_2 + Return * x_3$$

Where:

- AD is the average discount for the period
- b_0 is the intercept
- Beta is the coefficient for the calculated beta value between the market price of the fund and the market benchmark[1]
- SD is the coefficient for the annual standard deviation of a fund[2]
- Return is the coefficient for the annual return for a fund[3]

[1] Capital Asset Pricing Model (CAPM) from William F. Sharpe
[2] Modern Portfolio Theory (MPT) from Harry Markowitz
[3] Efficient Market Hypothesis (EMH) from Eugene Fama

The approach of equation 1 aims to calculate linear regression, that is, the correlation between the Beta of a closed-end fund and its average discount value. In this sense, the hypothesis is that a fund with a higher Beta has a higher average discount. It then evaluates the impact of unrealized capital gains and the distribution policy's impact.

Findings

Malkiel based its article on the assumption that closed-end companies trade at a constant discount; however, in the case of the securities traded on the TMX, that affirmation is inaccurate as commodities funds are the only ones that show a prevailing discount. On the other hand, Split Shares and equity funds presented mixed behaviours between 2019 and 2023, with extended periods where the market prices were above their Net Asset Value per share.

Unrealized capital gains

Funds have different income streams as investments bring returns followed by cash flows such as dividends, capital gains and interest. However, the increase in assets that have not been sold creates a virtual gain known as Unrealized Capital Gains. Malkiel stated that funds that have not realized capital gains expose investors to a further tax burden. The market penalizes these securities to offset the higher tax payments by assigning prices below their NAV value.

From 2019 to 2023, data shows funds did not increase the number of days trading at a discount in years with positive unrealized capital gains. For 2019, all funds carry unrealized gains on their balance sheets; however, the market showed mixed behaviour with funds that traded at a premium every day of the year. Moreover, within periods with an initial year of positive unrealized capital gains followed by negative unrealized capital, a decrease in the days

where funds are traded at a discount is expected. Over 17 transitions, only 8 presented a satisfactory result, which is not enough to establish a strong relationship.

Distribution Policy

Malkiel states that distribution policies impact shareholders depending on their interest in distributions. Low-income investors prefer constant payments to serve their daily expenses, whereas high-income earners prefer lower capital payout ratios to extend taxable events into the future. If a fund pays capital gains constantly, it is more efficient for tax purposes and should traded at a lower discount. In the case of funds traded at the TMX, those with a constant payment history are likelier to trade at a premium.

Commodity funds present the highest discount frequency, as described in Table 2; these funds make no distributions as their objective is to provide total exposure to precious metals prices. However, not all funds have the same characteristics, and distribution policies are a sign to predict discounts in the market.

In the case of CYB, an equity fund, has not established distributions to shareholders since it was listed in the market, and the trend of its behaviour is not predictable, as shown in Figure 1, with a high premium over 2019 to a deep discount in 2023.

On the other hand, EIT, an equity fund, constantly pays distributions to its shareholders; over the five years, the fund did not skip any payment or change its amount of $0.1 per month, and as shown in Table 2, it traded at a premium on average with the lowest volatility after commodity funds.

In the case of split-share corporations, distributions are mostly the return of capital. They make conditional payments if the NAV value is above a minimum threshold. Dividend yields for this fund type are usually higher than those of other asset classes. They behave like fixed-income

securities, providing a cash flow over time but more efficiently to investors as the payments are taxed as dividends, not interest. (Hymas,2006). Three out of the five split-share corporations analyzed made uninterrupted payments. The other two funds show a direct relationship between premium frequency and dividend payment.

The lack of distribution payments is not a characteristic that describes negatively discounted funds; however, those funds that made constant payments are likely to decrease the discount factor or support premiums in the Canadian market.

Letter Stock

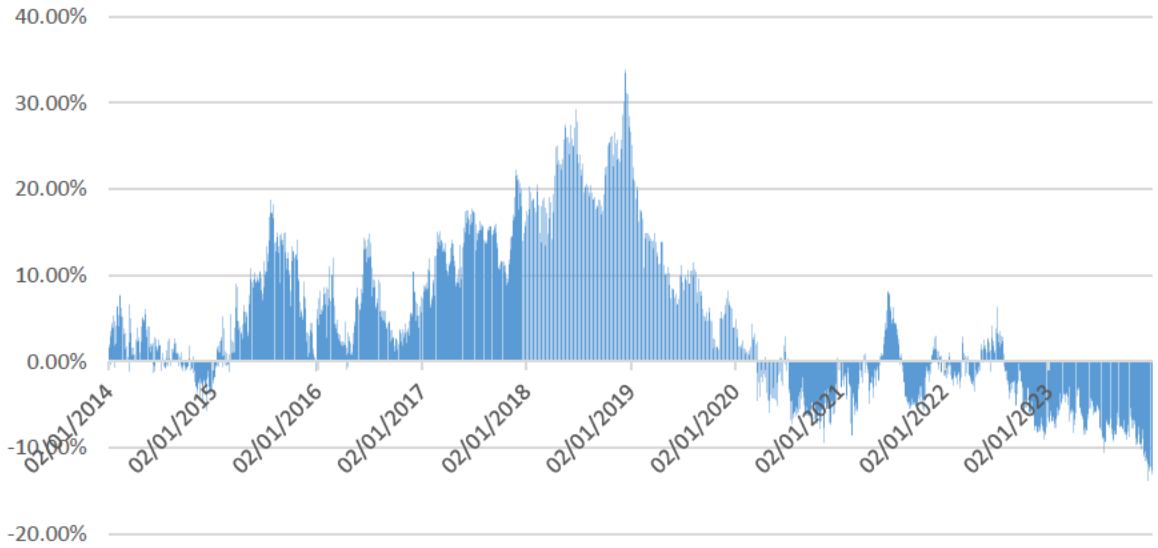
Letter Stock is an equity investment intended to be held in the foreseeable future (Nasdaq, 2024). Malkiel states that funds with restricted stock in their portfolio are traded at a discount as the liquidity of these assets is low. Malkiel adds that funds may be tempted to write higher valuations for these assets, which the market does not agree with, producing a discount on the holding company unit. Among the funds analyzed in TMX, all the assets are available for sale on public exchanges. Nevertheless, CYB has a stake in a private company not listed in the exchange, and its liquidity is low compared with the rest of its portfolio. The performance of the investment showed sustained growth since its inclusion; the fund in mention traded at a premium as the valuation of this private company increased over time.

However, in the last 3 years, the valuation presented deceleration (Appendix D), which coincides with a decrease in market premium to discount, as shown in Figure 4. The investment in a low-liquid asset significantly impacted the CYB discount factor, considering that M&A activity reached the lowest deal count in 6 years, as Appendix C shows. Therefore, letter stocks are relevant when negotiating closed-end funds in the Toronto Stock Exchange. It is expected

that acquisitions improve in 2024 (PwC, 2015), which will incentivize the market to decrease the discount on CYB in the following quarters.

Figure 4

CYB Discount magnitude



Note. Cymbria Corporation's discount presents a heterogenous discount from 2019 to 2023.

Holdings of foreign Stocks

As cross-border assets face tax rules in different jurisdictions, discounts or premiums can be explained regarding the net effect on its shareholders. The portfolios of the funds analyzed show securities listed in Canada and US exchanges with premiums and discounts over time. In the case of commodity funds, the operation of the funds offers tax advantages to US investors that coincide with a high frequency of discounts in both markets.

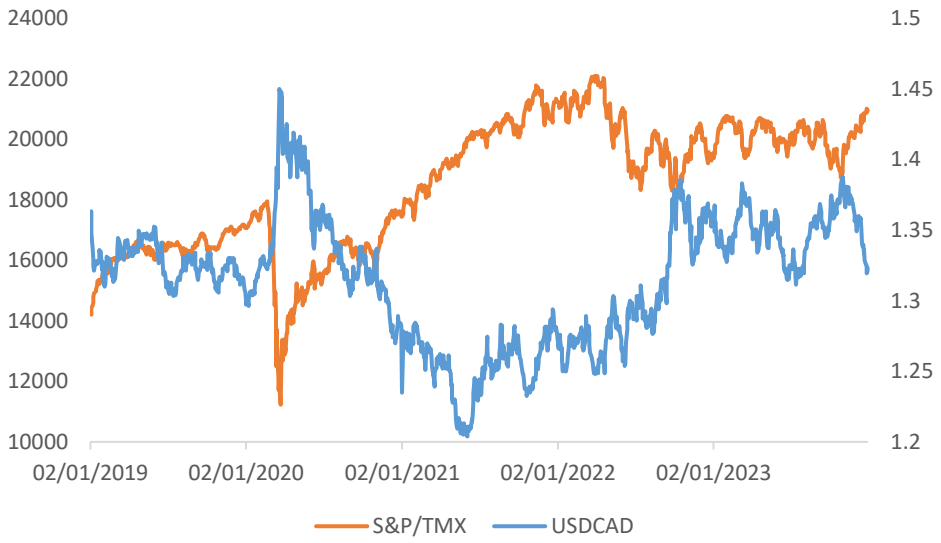
There is not enough evidence to state that holdings of foreign stock influence Canadian-based closed-end companies. Regarding investment vehicles with listings in different markets

and fund operations designed to be tax efficient, stakeholder data shows a persistent discount offset by savings in capital gains tax.

Additionally, those funds with holdings of foreign companies have exposure to assets in US dollars, which provides diversification in moments of market volatility, as shown in Figure 5 when there is a trend change in the S&P/TSX Composite index, the exchange rate between US and Canadian Dollars turns in the opposite direction providing a natural hedge to funds holding foreign securities.

Figure 5

Foreign Exchange Rate vs Market Index



Note. USD to Cad and the stock market index have an opposite relationship between 2019 and 2023. The correlation of these two economic indicators was -47%. *Global stock market indices trends. Data sourced from Yahoo Finance's "World Indices" page. Retrieved May 8, 2024, from* https://ca.finance.yahoo.com/world-indices/

Performance

Discount over NAV can also be an outcome of overall fund performance. Investors penalize funds that do fulfill their expectations (Malkiel, 1977). We compare annual returns, standard deviation, and beta to prove the previous claim and assess whether these factors predict discounts. Using a linear regression model, as shown in Equation 1, we want to identify the significance and relationship of the variables mentioned.

Equation 1

$$AD = b_0 + Beta * x_1 + SD * x_2 + Return * x_3$$

Where:

- AD is the average discount for the period
- b_0 is the intercept
- Beta is the coefficient for the calculated beta value between the market price of the fund and the market benchmark
- SD is the coefficient for the annual standard deviation of a fund
- Return is the coefficient for the annual return for a fund

Table 8

Linear regression results

	Coeficient	*Standar Error*	*t Stat*	*P-value*
Intercept	2.93%	0.16%	1.828	0.117
Beta	3.70%	0.01%	2.500	0.047
Standar Deviation	-0.06%	0.04%	-1.326	0.233
Return	-0.61%	0.26%	-2.343	0.058

Note. The results were run with historical data for each fund on their websites and price providers such as Bloomberg and Yahoo Finance.

The results shown in Table 8 describe a positive intercept for the equation, with a direct relationship between the discount value and beta. The standard deviation and the overall return have an inverse relationship. Additionally, the model explains 85.84% of the variance in the dependent variable (R Square = 0.8584). The significance F variable is 0.00587, lower than the conventional alpha level of 0.05, suggesting that the independent variables chosen are a good fit. However, in the last column, the p-value is presented for each variable, where at the 5% significance level, it is possible to conclude that only Beta has a significant relationship with market discount.

In the case of the variable return, its relationship with the discount has not had enough significant effect on the dependent variable. Therefore, investors do not define an optimal discount factor based only on the performance of the fund as Beta has a higher significance, it is possible to state that the higher sensibility a fund has compared with the market index, the trade discount is going to be higher or in the Canadian case positive.

Portfolio turnover.

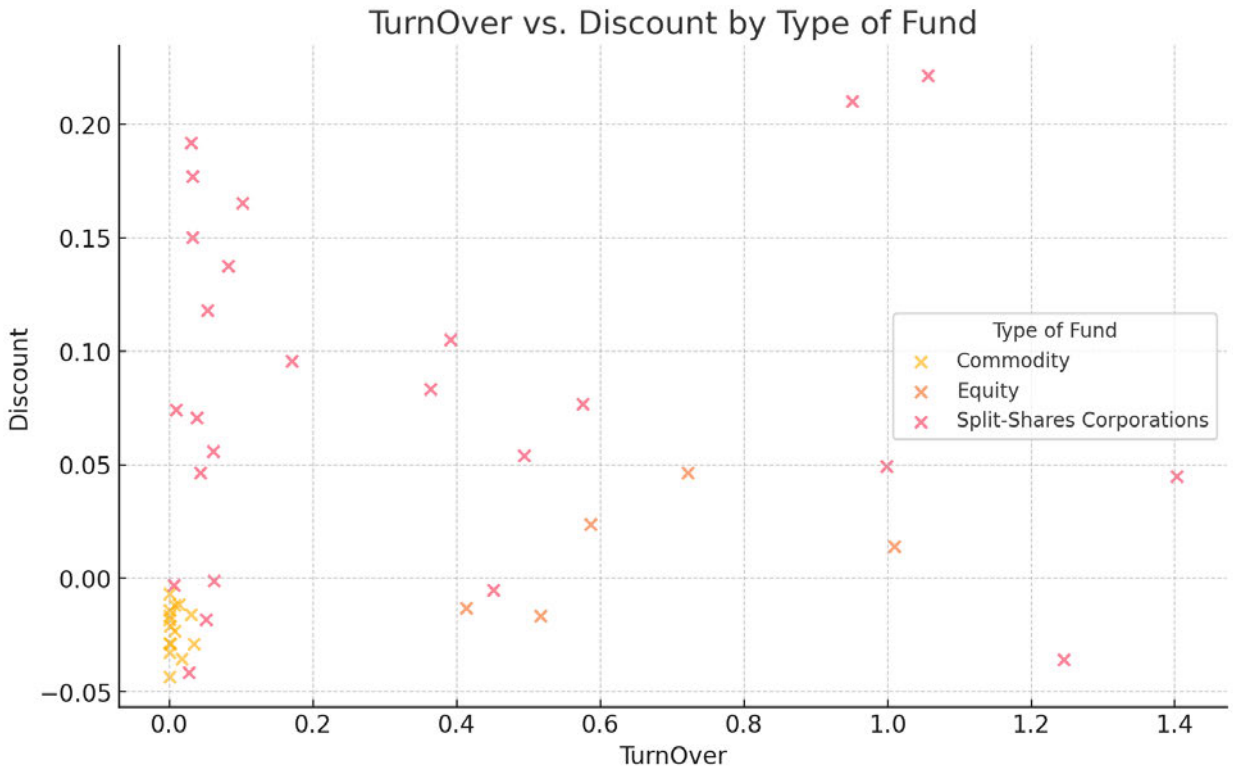
Portfolio turnover is related to higher commission fees that would reduce shareholder profitability. Besides, if securities are constantly sold, shareholders face capital gains events and subsequent tax consequences. Therefore, investors are negatively affected if a fund has a high portfolio turnover rate and will price the fund units in the secondary market at a higher negative discount.

In the case of Closed-end companies listed in the TSX, the average turnover per year is 26%. Therefore, it is expected that in a year, management teams will dispose of and add new securities equivalent to a quarter of the fund's value. In Figure 6, turnover rates are expressed on

the horizontal axis while the discount is measured on the vertical axis. Each point represents a fund's specific turnover rate and discount in a particular year.

Figure 6

Portfolio turnover vs market discount



Note. The horizontal axis represents the turnover rate and the vertical axis market discount. Each dot is representative of funds that are both read in a specific year. As the data spans between 2019 and 2023, each fund has five readings in the plot. CYB not included as turnover is not reported as a percentage

The graphic representation does not provide a visible pattern between the two variables. Moreover, the correlation coefficient between the discount and portfolio turnover rate is low at 0.22%. If a linear regression model was made with the discount factor as the dependent variable and the turnover rate as the independent variable, only 5.1% of the variance from the discount

could be explained by portfolio turnover. However, for values of turnover rate less than 20%, a simple linear regression model shows that 29% of the variance of Discount is explained by the variance of turnover rate with p values and F-statistic valid at a 5% significance level. Equation 2 describes the linear regression model; results are expressed in Appendix E.

Equation 2

$$AD = b_0 + tr * x_1$$

Where:

- AD is the average discount for the period
- b_0 is the intercept
- tr is the coefficient for portfolio turn over rate

It is important to mention that positive discount values represent negotiation made above the NAV value (Premium). Therefore, data doesn't support a negative relationship between the turnover rate and the discount factor, as suggested by Malkiel. Data shows a positive relationship as correlation and coefficient values from regressions are also positive. This could be explained by positive performance because of take-profit strategies directly related to turnover rates.

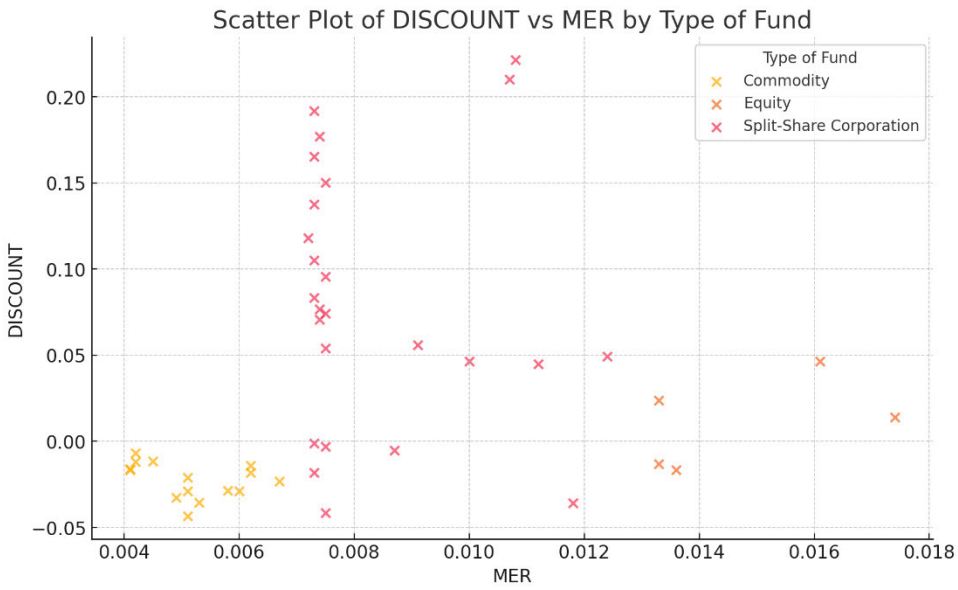
Management fee.

High management fees negatively affect the fund's performance, increasing the discount factor. Those fees are in addition to any commission fees, interest, taxes, and expenses that are usually related to the daily activities of the fund. In the case of the funds analyzed, fees are calculated as a percentage of the daily NAV and are not constant over the years; therefore, figure

7 shows the discount factor and MER for every specific year; fees start at 0.41%, with the highest at 1.74%.

Figure 7

MER vs Market Discount



Note. The horizontal axis represents the Management Expense Ratio (MER), and the vertical axis represents a fund's market discount. Each dot is representative of a fund's reading on both variables in a specific year.

According to the theoretical relationship between these two variables (Malkiel, 1977), data plots are expected to be found on a negative slope. However, the data does not show a visible pattern. The correlation coefficient between MER and discount factor is 18.8%, signalling the opposite relation as suggested by Malkiel.

Equation 3

$$AD = b_0 + MER * x_1$$

Where:

- AD is the average discount for the period
- b_0 is the intercept
- tr is the coefficient for the Management Expense Ratio

A linear regression, as expressed in equation 3, shows that the discount variance is explained in a 3.5% by the MER variance, and MER's explanatory power to explain the discount effect is limited with a significance F of 0.21 well above the 0.05 level to fulfill a 95% confidence interval (Appendix F). The P-value of the coefficient for MER is also above the 0.05. There is no explanatory power between the Management Expense Ratio and the market discount for CEF in Canada.

Conclusion

The primary objective of this study is to determine whether closed-end funds (CEFs) on the Toronto Stock Exchange (TSX) consistently trade at a discount, as described by Malkiel's postulates. The analysis reveals that Malkiel's assertion that CEFs generally trade at a discount only partially applies to the Canadian market.

Malkiel's postulates were supported in the case of commodity funds but not entirely for equity and split shares funds, which exhibited more complex behaviours. The main finding for each category of funds is that commodity funds trade at a discount influenced by tax efficiencies available to US investors. Equity Funds showed volatile discount patterns influenced by

conditions such as management policies, fund performance and repurchase programs. On the other hand, split shares frequently trade at a premium, which their dividend policies and capital structures can explain.

In conclusion, while Malkiel's postulates provide a foundational understanding of CEF discounts, they do not fully explain the pricing behaviour of Canadian closed-end funds on the TSX. Tax efficiencies, market conditions, and specific fund characteristics significantly influence these funds' trading prices. Therefore, investors should consider these additional factors when making investment decisions.

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Appendix

Appendix A

Trading Statistics Closed End Funds

Name	RootTicker	Value (C$) YTD 2023	Number of Trades YTD 2023	Market Cap (C$)
Canoe EIT Income Fund	EIT	$ 586,896,575.00	118166	$ 2,494,594,035.16
Life & Banc Split Corp.	LBS	$ 255,831,602.50	57725	$ 734,465,415.87
Dividend Growth Split Corp.	DGS	$ 222,447,860.00	73128	$ 655,766,339.87
E Split Corp.	ENS	$ 198,461,851.50	48666	$ 469,976,532.48
Sprott Physical Gold Trust	PHYS	$ 189,746,190.00	27294	$ 6,404,806,843.60
Sprott Physical Silver Trust	PSLV	$ 183,418,235.50	39532	$ 4,016,351,819.90
Brompton Split Banc Corp.	SBC	$ 126,593,205.00	30944	$ 403,219,388.54
Global Dividend Growth Split Corp.	GDV	$ 105,948,775.50	31299	$ 289,767,276.95
Cymbria Corporation	CYB	$ 96,575,310.50	8438	$ 987,995,730.70
Sprott Physical Gold and Silver Trust	CEF	$ 85,440,824.50	18848	$ 4,116,237,731.00

Name	Root Ticker	Average Trade	Turnover
Canoe EIT Income Fund	EIT	$ 4,966.71	23.5%
Life & Banc Split Corp	LBS	$ 4,431.90	34.8%
Dividend Growth Split Corp	DGS	$ 3,041.90	33.9%
E Split Corp	ENS	$ 4,078.04	42.2%
Sprott Physical Gold Trust	PHYS	$ 6,951.94	3.0%
Sprott Physical Silver Trust	PSLV	$ 4,639.74	4.6%
Brompton Split Banc Corp	SBC	$ 4,091.04	31.4%
Global Divividend Growth Split Corp	GDV	$ 3,385.05	36.6%
Cymbria Corporation	CVB	$ 11,445.28	9.8%
Sprott Physical Gold and Silver Trust	CEF	$ 4,533.15	2.1%

Note. Data adapted from "Sector and Product Profiles: Closed-End Funds," by TSX, January 2023. (https://www.tsx.com/listings/listing-with-us/sector-and-product-profiles/closed-end-funds).

Appendix A gathers trading information for the 10 funds analyzed and provides insights about the average trade by dividing the total value traded for the year over the number of trades. Additionally, turnover is expressed as the division of total traded value over the market capitalization.

Appendix B

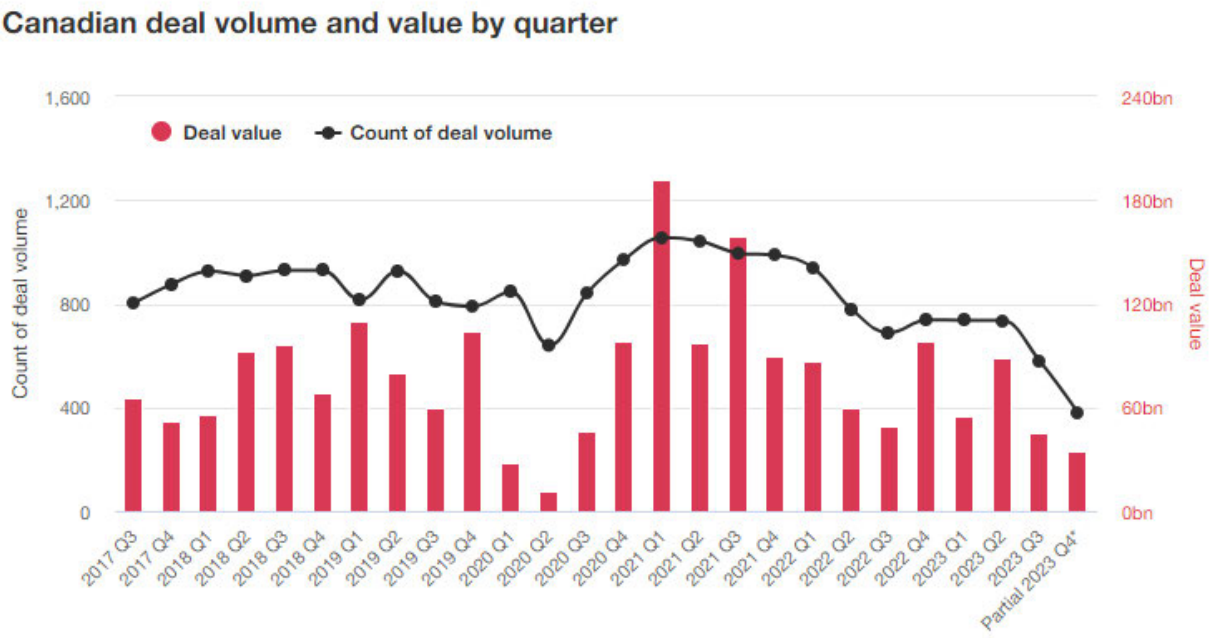
Discount values

	CEF	PHYS.TO	EIT-UN.TO	LBS.TO	DGS.TO	ENS.TO	PSLV.TO	SBC.TO	GDV.TO	CYB.TO
MAX	1.11%	2.93%	8.69%	82.18%	59.78%	36.18%	3.59%	36.85%	54.44%	25.08%
AVERAGE	-3.23%	-1.25%	1.20%	9.05%	4.97%	5.41%	-2.26%	8.09%	9.77%	-0.62%
MEDIAN	-3.45%	-1.21%	1.19%	5.91%	4.18%	4.87%	-2.46%	5.47%	6.39%	-1.74%
MIN	-5.60%	-3.59%	-9.17%	-8.18%	-16.91%	-11.12%	-4.98%	-6.21%	-17.43%	-13.01%

Appendix B provides information about the range of discounts positive values express trades made at a premium. The data was constructed with information available on public exchanges.

Appendix C

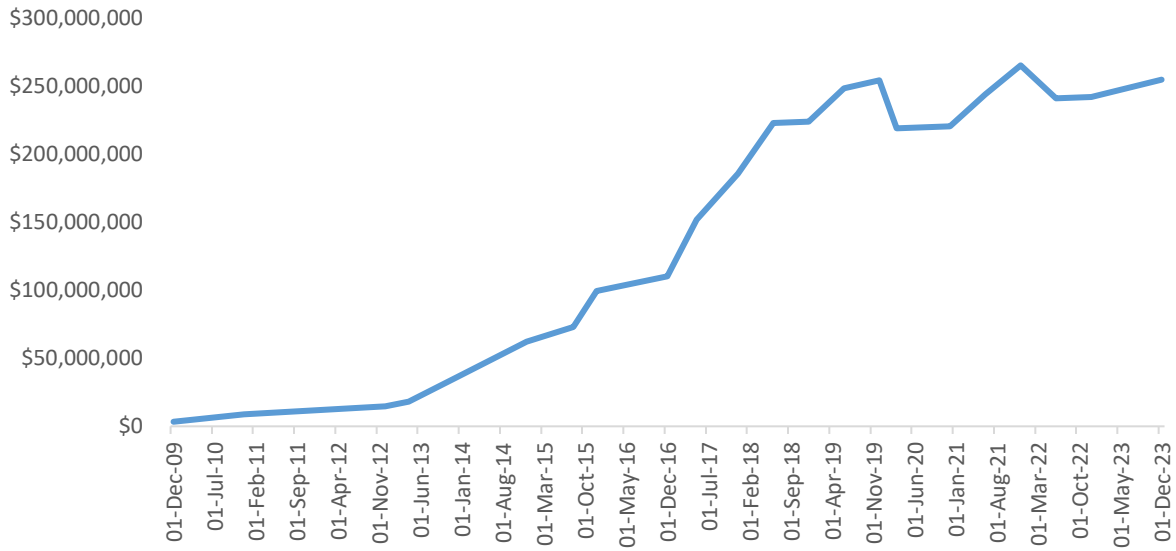
M&A activity in Canada



Note. Taken from "Trends in Canadian Mergers and Acquisitions," by PwC Canada, 2024 (https://www.pwc.com/ca/en/services/deals/trends.html).

Appendix D

Value of Cymbria's stake in Edgepoint



Note. Value of Edgepoint in CAD, Adapted from Cymbria's website Cymbria, 2024 (https://cymbria.com/portfolio/?tab=edgepoint-valuation).

Appendix E

Equation 2, linear regression results.

Regression Statistics	
Multiple R	0.226070186
R Square	0.051107729
Adjusted R Square	0.029040467
Standard Error	0.074058183
Observations	45

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.012702355	0.012702355	2.31599774	0.135369695
Residual	43	0.235838425	0.005484615		
Total	44	0.24854078			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.027042	0.013437373	2.012446905	0.050463014	-5.70456E-05	0.054141046	-5.70456E-05	0.054141046
TurnOver	0.043410729	0.028525155	1.521840248	0.135369695	-0.014115729	0.100937187	-0.014115729	0.100937187

Appendix E provides results and statistics from equation 2 linear regression, observations are based on yearly readings.

Appendix F

Equation 3, linear regression results.

Regression Statistics	
Multiple R	0.188280528
R Square	0.035449557
Adjusted R Square	0.013018152
Standard Error	0.07466672
Observations	45

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.008810661	0.008810661	1.580353807	0.215495277
Residual	43	0.239730119	0.005575119		
Total	44	0.24854078			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.002911237	0.030567392	0.095239961	0.92456669	-0.058733784	0.064556258	-0.058733784	0.064556258
MER	4.456265427	3.544817549	1.257121238	0.215495277	-2.692540473	11.60507133	-2.692540473	11.60507133

Appendix F provides results and statistics from equation 2 linear regression, observations are based on yearly readings.