



University
of Stavanger

KJETIL LINDSTRØM VIKSAND, CANDIDATE 9113
SUPERVISOR: BERNT ARNE ØDEGAARD

Do Coal stocks sufficiently reflect the shift towards sustainable energy and net zero emissions?

A comparison between existing theory and representative findings

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Executive summary

In this paper, I establish a theoretical background of established theories explaining how the intended behavior of coal stock is

The goal of the thesis is to provide an answer to the question “Do Coal stocks sufficiently reflect the shift towards sustainable energy and net zero emissions?”

As the theory tells us that coals stocks are reflecting a shift towards sustainable energy, I need to examine several results up against expectations and see if they match.

I select five representative companies for the coal sector, with three different locations, China, USA, and EU, to examine the different results between them.

I use these representative companies and look at annual reports to find financial information and balance sheets, and look at the following attributes to determine if they fit the expected values in the following attributes:

ESG Rating – They fit well; everything is as theory expects.

WACC – The cost of capital, again everything fits the theory of higher-than-average cost of capital for coal related stocks.

Price – Mostly as expected, but there is some deviancy here that opposes the “yes” to the research question. Prices increasing short term in 2022 is okay, as there is relevant theory to explain it.

P/e Ratio – Mostly fits with existing theory, enough to pass it for this category

Revenue and cost growth – Not as expected

Overall results are mostly as expected; however, the revenue and cost growth were not as expected from the theory, and therefore I cannot give the answer to the question on if the stock reflect the shift sufficiently with a clear yes. The answer is currently “Likely yes” but further research is required into the failing attributes.

Preface

This thesis is the conclusion of my master's degree in Business Administration, Applied Finance at the University of Stavanger. It has been exciting to learn about the subject, but it also proved challenging. Completing this thesis has provided a feeling of accomplishment and learning, and it was a new experience to dive deep into a new subject for such a long period of time.

I would like to thank my advisor Bernt Arne Ødegaard for his guidance, and my friends and family for their continued support throughout the period I worked on this.

Kjetil Lindstrøm Viksand

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1. Introduction

The coal Industry is existing on borrowed time as the world works towards pivoting into sustainable energy. The Paris agreement most countries have signed aims to work for net zero carbon emissions by 2050, and a large reduction in emissions by 2030.

As coal is one of the largest offenders of Carbon emission, it has a limited timespan left before it becomes obsolete, it's not a question of if, but when.

Previous research shows a decline in coal stock except during abnormal events that spike demand, such as the 2022 energy crisis, as found by Bauer et al (2022) and IEA (2022). It shows that coal stocks have a higher cost of capital because of the inherent climate risk, which can be measured by a high ESG risk rating.

The goal of the thesis is to help provide support to answer the question:

“Do Coal stocks sufficiently reflect the shift towards sustainable energy and net zero emissions?”

In order to contribute towards answering this I prepare a portfolio of five selected companies that operate mainly in coal and use these as comparative representatives for the coal industry. In the paper I look at different attributes for these five companies and assign them an expected value based on theory. I later compare the expectation to the actual attributes.

This paper will open with theory surrounding coal pricing and climate measures and continue into Method of why I select 5 companies, and why I chose the timeline from 2014-2022 as the main period of interest.

It explains which attributes I have selected to look for the expected behavior in, which are the following: ESG Risk Rating, weighted average cost of capital, Price to Earnings Ratio, Growth in revenue and operating costs and the stock price.

I then explain the expected range of values for each attribute and analyze the chosen 5 stocks to see if it matches the expected values.

The results can vary between each attribute, but as a general rule there are two outcomes for each attribute

H0 = The attribute does not match expectations based on previous theory. The coal stocks do not sufficiently reflect the shift towards sustainable energy and net zero emission for the given attribute

H1: The attribute matches expectations based on previous theory. The coal stocks do not sufficiently reflect the shift towards sustainable energy and net zero emission for the given attribute

This is valuable because it gives insight into which attributes conform with popular theory, giving further support to them, and which opposes the theories, giving challenge

This paper also includes some relevant background theory that do not directly impact the given valuables, but help form an understanding of the current situation for coal stocks.

1,1 Historical Overview of Coal mining.

Coal mining has archeological findings dating the use of coal back to the bronze age, more than 3000 years ago. This was not acquired by digging mines underground like in newer times, as they worked on coal seams from the surface instead, lacking the technology to safely go underground.

In the late Middle Ages techniques for making shafts underground, like large wells dug down to extract the coal. In England they managed to empty all their shallow mines, and they had to expand deeper.



*Image 1: Old fashioned coal mine,
Source: Thecanadianencyclopedia.ca(2006), Coal Mining*

Image 2 Technological advancements in the mining industry has changed the course of the workday for miners. Here is a picture of a bucket wheel excavator, Getty images, picture alliance.

With the industrial revolution, coal became not only easier to acquire with new tools and technology, but also more valuable as there was an increased demand for the fuel to operate machinery, heating and similar.

In modern times, the coal mining as the world knew it has changed a lot. It is ruthlessly efficient, able to extract in months what would have taken decades in the past.

(Evans & Ramani (2023))

The mining of coal is likely nearing its end, as global warming is becoming an issue and countries work together to try and transition into sustainable power generation. A large amount of the world still relies on electricity from coal powered generation, so the coal companies still have value until that issue is solved.

2. Background and literature

2.1 ESG and sustainable investing

ESG, or Environmental, societal and governance factors have been an increasingly popular topic in the latest years. According to Pollman, (2022), the term ESG is used synonymously with sustainability and risk management towards carbon neutrality. She observes that there is no consensus on the meaning of ESG currently, and as such it can be used to describe many things, in this case mostly carbon emission and environmental concerns. These concerns also tie into societal concerns, as clean stocks often aid society as well.

When talking about ESG in relation to coal companies, it is used in a way where you have to look at the term in the common view of whether or not the company is helping or harming the carbon emission issue. (Pollman, 2022)

A 2020 report by IISD, the International Institute for Sustainable Development, have identified several key drivers and trends in sustainable investing. They find that the driving force behind sustainable investing can be summarized as: Private investors that are more climate conscious

than previous generations, namely millennials and younger tend to invest in sustainable companies to a larger degree. Institutional investors, which have started to incorporate companies with high ESG scores in their portfolio to diversify away from ESG-related risks. They find that Institutional investors with larger portfolios tend to have a higher focus on sustainability than those with smaller portfolios. Risks from policy changes like taxation on carbon emission, is also mentioned here as a strong driving force of the switch to sustainable investments, which in turn also means driving investors away from low ESG rated stock like coal driven companies. (Uzsoki, 2020)

Hao et al (2022) talk about coal stocks having inadequate protection against environmental concerns, social issues and poor governance. This means coal stock has a low performance in all three ESG categories, which supports coal having an expectation of a bad ESG score.

2.2 Green and Brown stock

You can separate the extremes of ESG performance into two categories, green and brown stocks. The green stocks are stocks that score highly on ESG performance and are seen as having a higher demand because of it.

The brown stocks are stocks that score low on ESG performances and are therefore shunned by climate conscious investors. Examples of brown stocks are coal, oil, tobacco

Green stocks are better positioned financially to perform well in a low-carbon world, while brown stocks hold a stronger position in a high-carbon world. As the vast majority of the world has set a goal of reducing carbon emissions greatly towards 2050 with the Paris agreement of 2015, green stocks are set up to provide solid financial performance when compared to brown stocks with a long term perspective (Bauer et al, 2022)

Investors that hold green stocks care less about having a high return on investment, because they enjoy holding the stock for climate positivity reasons, as well as to hedge against climate risk (Pastor et.al, 2019)

Bauer et al (2022) finds that the brown stocks like coal outperformed their greener counterparts during the 2022 energy crisis, based on their initial analysis done the same year.

Bolton & Kacperczyk (2021) analyze expected return tradeoff and standard risk with traditional efficient capital market theory and find evidence suggesting a higher cost of capital is required for the brown firms. This is because the brown firms are less attractive with their associated carbon risk and must offer a higher expected rate of return in order to attract investors.

2.3 Bans on coal and Increased taxation

In the 2021 UN climate change conference in the UK, more than 40 countries pledged to phase out coal. More than half of them signed on for the first time, and among them were countries such as Ukraine, Poland and South Korea, which are all part of the top 20 power-generating countries (Plumer & Friedman, 2021)&(UN Climate Conference, 2021)

Bans like this will reduce the demand for mined coal, as less countries plan to use it for power in the future.

2.4 The green shift

Bolton and Kacperczyk (2022) discuss the uncertainty of the rate of transition into carbon neutral energy production, as it will require significant changes to many sectors still, such as coal. For example, every firm need to evaluate the risk connected with transitioning into carbon neutrality against the risk of continuing normal operations in a more and more climate conscious world. They talk about how mitigation of climate change might require a global carbon tax equal to the cost of carbon to properly incentivize the shift, as the switch is less logical if they can still turn a larger profit after paying the carbon tax.

2.5 Energy crises

In 2022, the world started facing an energy crisis where prices of electricity increased by a large amount in a short period of time. This is because there was very low power production compared

to power needs as many countries had tried to shift away from fossil fuels such as coal to an unsustainable degree. This many countries cannot make the switch until an alternative is in place, as the country cannot operate without electricity, and the demand exceeds production of sustainable alternatives.

In an article that's part of the World Energy Outlook report from the International Energy Agency, IEA, which provides detailed up to date reports on energy, such as that provided by fossil fuel, they talk about how the 2022 energy crisis led to countries investing new money into "dirty" energy such as coal in the short term. (IEA, 2022)

Bauer et al (2022) mention and discuss the impact of the 2022 energy crisis on the expected return for green and brown stocks. The expected return for brown stocks has increased during this period, as the demand for energy outweighs the goal of the energy being clean during this period. There is not enough clean production of energy to provide the necessary power currently, so coal powered energy plants are required for society to function, which momentarily spiked demand and interest. During this period, brown stocks outperformed green stocks. This is a reversal of Bauer et al (2022) s previous findings, where they found green stocks to be outperforming brown stocks during the last decade. However, it is expected that this is a temporary development, as the goals of the Paris agreement are still unchanged, and the consensus of the world is that we must go green. This leads expectations towards green stocks having a better long-term performance, because of the climate associated risks that are part of brown stocks like coal.

The Chinese experienced the effects of an energy crisis with similar properties the year prior, 2021. This had a strong impact on the country's transition to low carbon energy, as coal expanded and profited by helping power the country with coal plants. (Meidan, 2022) wrote a report about the implications of the crisis in China and found the increased coal production might have an impact on the climate policies of China moving forward. Since China is dependent on coal powered electricity for a majority of their energy use, and have few replacement alternatives so far, coal companies are expected to have a better performance in China.

Both crises are expected to have short term impacts on price, but no long-term effect on growth of coal stock as the focus of countries that are working towards climate neutrality won't change. (IEA, 2022)

2.6 The Paris Agreement

The UNFCCC secretariat, which stands for United Nations Framework Convention on Climate Change, is the part of the UN that is responsible for the Paris Agreement. They provide reliable information about the Paris agreement and its intention.

The Paris agreement is a defining legally binding deal signed between 196 countries in December 2015. A year later, November of 2016 it went into effect. The main points of the Paris agreement is to reach net zero carbon emission by 2050 and limit global warming to 1.5degrees Celsius. It also has a clear goal that greenhouse gas emissions must peak at the latest before 2025, and decline by 43% before 2030(United Nations, 2015) This is an important factor for coal companies, as they must reduce their emissions greatly in the coming years.

A 2016 report by Rocha et al, find that current coal plans for powering and mining would exceed the CO2 Emission budget required to fulfill the goals of the Paris agreement. They discuss how the world is going to rely more and more on negative emission technologies after 2050 to try to mend the damage caused by coal-caused emission.

(Rocha et al, 2016)

The short-term Effect of the Paris agreement on coal stock has been examined by Banga (2018) which found it to be a catalyst for splitting renewable energy and coal stocks performance. The renewable energy stocks rose, and the coal stocks fell after the signing.

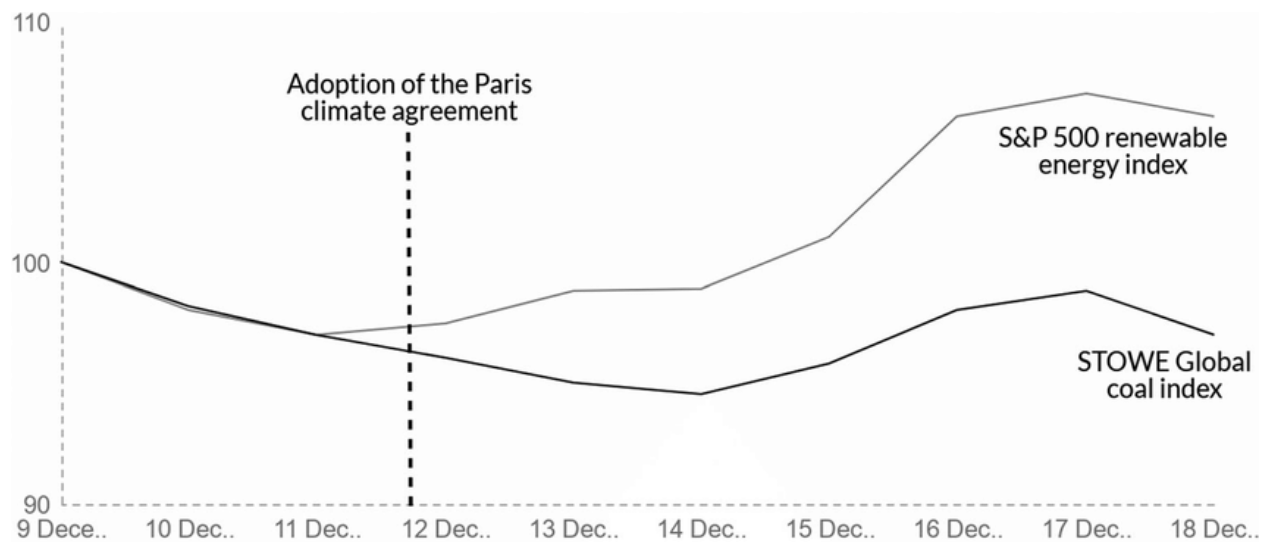


Figure 1: This figure shows the immediate market reactions to the signing of the Paris agreement in 2015. It is shown that this caused a split between renewable energy and coal, where coal was priced lower as a direct result of the agreement and its implications.

FIGURE IS COLLECTED FROM AND MADE BY Banga(2018) *The green bond market: a potential source of climate finance for developing countries*. See appendix for details.

To determine the long-term effects, it ties into more general theory about brown stocks like coal. For example, Bauer et Al (2022) found that brown stocks like Coal have often stopped outperforming green stocks in returns. It used to be thought that a “Carbon premium” was associated with brown stocks, where they would yield a higher return at the cost of significant ESG related risk. However, Bauer et al’s findings document that green stock has had higher returns than brown stocks after the signing of the Paris Agreement. There is no clear consensus on this yet, as Bolton and Kacperczyk (2021) find evidence supporting the existence of the Carbon premium still, showing brown stocks yield higher returns and higher cost of capital.

2.7 The European green deal and other regulations

The European green deal, which strives to reach the goal of no net emissions of greenhouse gases by 2050 for Europe was enacted in 2019 as a follow-up to the famous Paris agreement of 2015. It aims to fulfill the goals of the Paris agreement and implement it by law in the EU. (European commission, 2023)

As a consequence of the deal, European Climate law makes law of the content of the green deal and has a goal of 55% reduction in emissions by 2030. This has caused a solid downsizing in

coal companies in Europe, as stricter policies against emission leads to higher fines for non-compliance, such as carbon tax. (Parry, 2021)

Carbon pricing is one of the deterrents implemented against using fossil fuels like Coal, and it's implemented through taxation based on the carbon content of the emissions each firm causes. More than 60 Carbon taxation programs have been introduced all over the world. The carbon tax is a mitigation strategy developed to stop production of fossil fuels, as it ends up becoming prohibitively expensive in time (Parry, IMF, 2021)

2.8 Exclusion of coal stock from portfolios and divestment

As the focus on ESG investing and climate positivity increases, Brown stocks like coal are less attractive for investors. Attempting to reach high ESG scores to become green on the other hand have shifted from a state of early development into becoming a mainstream financing tool for many corporations, which leads to a larger number of sustainable businesses according to a report from OECD (2021)

Brown stocks have been slowly excluded from large environmentally conscious funds for many years now, and it doesn't seem to slow down given its current pacing. A look at the world's largest sovereign wealth fund, Norway's NBIMs Government Pension Fund Global, shows a large number of brown stocks being excluded, including several large coal producing companies, for example RWE, which is Europe's largest coal-powered electricity provider (Nbim.no, 2023)

Bauer et al(2018) Examines the relationship between increase in climate positive adoption by countries, and divestment from coal. They find that the Paris agreement's strong signal and ambitions on combating climate change have led to a divestment from coal, and expect it to continue towards 2030's goalpost, and especially towards 2050 with the carbon neutrality goal.

2.9 ESG AND PERFORMANCE

Chava, (2011), finds support for companies with low ESG scores having a higher cost of capital, as fewer banks provide loans to them because of environmental concerns. She theorizes that this

will lead to firms adapting to better fit ESG expectations in order to reduce the cost of equity of and debt, as it is increased by environmentally conscious lenders.

Similar findings are found by Breuer et al, (2018), which examine a large sample of companies and finds that increased Corporate Social Responsibility (CSR) generally leads to a higher cost of equity. This is further support to the theory that higher ESG scores lead to lower cost of capital generally.

As coal companies have a lower ESG score because of their carbon emissions and environmental concerns, this applies to them, and expectation are that they will have a higher cost of capital than greener alternatives.

2.10 Differences between regions for coal companies

Differences between the value a company receives in a region could end up being different due to differences in the emission trading scheme (ETS) of the region, which encompasses things like carbon taxation and costs related to carbon emission. Ma (2013) Explores the differences and similarities in how the Chinese and European ETSSs, and finds that the EU applies a more strict and aggressive approach to combating climate change, they are straight to the point in combating carbon emissions. China on the other hand is found to have a more lenient and passive approach according to Ma (2013)

China has a more robust demand in Asia, as there are more emerging economies, compared to the more stagnant advanced economies of Europe and the US according to the report “Coal 2022” by the international energy agency. (IEA, 2022)

Europe is ahead of the other continents with its currently planned phase out dates for coal, as it is a greater possibility for Europe to switch to sustainable energy production. The European phase out dates for coal means they will take the lead in implementing policies to move away from coal. This is part of the key findings of a 2016 Climate Analytics report (Rocha, 2016)

3. Analysis selection

3.1 Selecting Representative Coal-Based Companies.

In order to find results to help illuminate if the price of coal related stocks accurately reflect the declining state of carbon emitting stock, I select five representative companies to take a closer look at. I selected five of them, as that should give a pretty good overview of the general state of coal stocks.

If there are any outliers in terms of results, this will be examined closer in the discussion part of the paper.

The companies I have selected to represent the Coal industry, as they are all base their production and income on coal, are in pretty similar situations, so they can give a pretty good indication of the current state of similar stocks. They are intended to be comparable to other coal firms, so the portfolio provides a comparative look to the industry as a whole.

The companies are spread out in three primary regions, so it can be interesting to see if that has any effect on the results.

The selected companies for further analysis is the following:

Peabody Energy Corporation (BTU)

Peabody is a leading coal producer in the US, and the worlds largest coal company by market cap. Their large size and stable financials makes them a good representative to analyze for this thesis. (Peabodyenergy.com, 2023)

Alliance resource partners (ARLP)

Alliance resource partners is the second largest coal producer in the eastern united states, that makes most of their income from coal mine production. ARLP was selected to represent the United States in this analysis as they are one of the largest coal companies there and will have comparable financials to other US coal producers. (ARLP.com, 2023)

Yankuang energy group company Ltd (SHA: 600188)

Yankuang energy group ranks number 23 of the worlds top 50 mining companies, and one of the largest in China. Their coal mining operations is responsible for a majority of their income, and they were selected as one of the companies to represent the Chinese sector because of their large size and importance to the Chinese coal market. They will have comparable financials to other large coal producers. (Yanzhoucoal.com.cn, 2023)

Glencore (LON: GLEN)

Glencore is a company that does not only deal in coal, but other fossil fuels as well. They are still one of the largest coal producers and have a large coal mining operation in Australia. They have their headquarters in Switzerland, and is counted as a European company.

However since they have a wider portfolio than the other companies selected, some deviation in the results can be expected (Glencore.com, 2023)

China Shenhua Energy Company Ltd (SHA: 601088)

China Shenhua Energy Company Ltd, or China Shenhua for short, is a coal based energy company that has their coal mining operation as the central part of their company. It's a very large company with 83 000 employees, the third largest coal producing company in the world, and is a good representative company to analyze. (Csec.com, 2023)

This gives 2 large Chinese companies, 2 large us companies and one large company based in Switzerland that operates globally, for a good mix meant to represent similar stocks.

3.2 Time period.

I have selected the period from the start of 2014 to the end of 2022 as the period of interest for my analysis. This period was selected because it includes a period for the stock just before the Paris agreement was signed, as well as the period after up until the most recent annual reports.

I will look at the selected representative companies during this period, but I will also look at them from 2014 to 2021, where 2022 is excluded. The reason for this is the energy crisis of

2022, and to check if that might skew results. That way I will provide one result with “real” numbers which includes 2022, and a shorter one that represents the direction of coal until 2022, which might be more representative for a longer term perspective. IEA, the international energy agency reported in 2022 that coal consumption reaches new heights as a consequence to the energy crisis. This is cutting it close to the Paris agreements demand of peaking in 2025 at the latest, but still not breaking any barriers.

Im not including any data from 2023, as the Financials from annual reports stop at the end of the current year.

4.Methods

I will use the following methods in order to find key numbers for comparison with expectation. Some of the methods might be required to find one of the other parts, and as such might not be part of the final key numbers analyzed.

4.1Price to earnings Ratio (PE)

The Price to earnings ratio will tell us how much an investor is willing to pay, the stock price, compared to how much the company actually earns per share.

The P/E Ratio can be useful in telling you the markets expectations of a company. A high P/E ratio means the market expects the company to grow their earnings substantially in the future, so they are willing to pay more now.

A Low PE ratio could indicate that the company is not expected to have much growth.

The formula for finding the P/E Ratio is simply

$$\frac{P}{E} \text{ Ratio} = \frac{\text{Share price}}{\text{Earnings per share (EPS)}}$$

4.2 CAPM – The Capital Asset Pricing Model.

Capm is widely used as a leading asset pricing theory. It is powerful, simple and measures the relation between expected return and risk in an easy-to-understand fashion. (Fama and French,

2004)

Capm can be used to get the cost of equity for the WACC.

The cost of equity can be expressed through the CAPM as

$$\text{Cost of Equity} = R_f + \beta(\text{MR} - \text{RF})$$

4.3 Weighted average cost of capital (WACC)

The weighted average cost of capital is an important financial parameter, that tell us the average expected rate a given company is calculated to pay in order to acquire financing for its assets. By the same measure, it can be seen as the required return investors needs to receive to invest in the company. (Rehman, 2010)

The Weighted average cost of capital is determined by the formula:

$$WACC = \left(\frac{E}{D + E} * Re \right) + \left(\left(\frac{D}{D + E} * Rd \right) * (1 - T) \right)$$

Where E is equity and $\frac{E}{D+E}$ is the Weight of Equity

Re is the cost of Equity

D is interest bearing debt and $\frac{D}{D+E}$ Is the weight of debt

Rd is the cost of debt

And T is the Tax rate.

4.4 Revenue and revenue growth

The formula for revenue growth Year over Year can be expressed as

$$\frac{(\text{Revenue}_N - \text{Revenue}_{N-1})}{\text{Revenue}_{N-1}}$$

4.5 Operational cost growth

Similar to the formula for revenue growth Year over Year, Growth in operational cost can be expressed as

$$\frac{(OpCost_N - OpCost_{N-1})}{OpCost_{N-1}}$$

4.6 ESG risk rating

The ESG risk rating is a score that a rating agency will give a company in order to estimate their associated ESG

The most important part when looking at ESG ratings, is using ratings from the same rating agency when comparing between companies, so the same methodology is used for calculating it. This is especially important with ESG as Berg et al (2022) talks about a large difference in score between agencies. This is because the ESG term is too broad, and since there are no consensus for what to measure and how to weigh it, ratings have low correlation between agencies.

4.7 Market risk premium

The market risk premium is the difference between an expected return and the risk free rate. It is used to calculate the Cost of equity, which is needed for the WACC

The historical average for the region relevant to each company, from Professor Aswath Damodarans website, professor at Stern School of Business at New York university. (Damodaran 2023)

The MRP used in calculations is determined as separate based on the region, which gives the following MRPs:

China = 7.16%

This is used for Yankuang Energy Group Company Limited (SHA: 600188) and China Shenhua Energy company Limited (CSUAY)

United States = 5.94%

This is used for Peabody Energy Corporation (BTU) and Alliance Resource Partners (ARLP)

Switzerland = 5.94%

This is used for Glencore Plc (GLCNF), as they are based in Switzerland.

5. Data

5.1 Historical price data

I have Collected Historical price data on 5 Companies; Glencore (LON: GLEN), China Shenhua Energy Company Ltd (SHA: 601088), Alliance Resource Partners (ARLP), Yankuang energy group company Ltd (SHA: 600188) and Peabody Energy corporation (BTU)

The data is collected for the period January 2014 – December 2022, and the frequency is daily. The exception is Peabody Energy corporation, where the data collected is from the period April 2017-December 2022.

All the historical price data is gathered from Investing.com

This data is used for price analysis and P/E Calculation.

5.2 SEC EDGAR – 10Q filings

I make use of the US government **E**lectronic **D**ata **G**athering, **A**nalysis and **R**etrieval system, EDGAR, from Sec.gov in order to find the 10-K (Annual reports) reports for the American companies I selected. From these annual reports, I find useful information such as consolidated financial statements.

I have collected annual financial data about Peabody Energy Corp, from their annual reports from the years 2017-2022. The reason for this being a shorter time span is because they were not publicly traded on exchanges for a period before 2017, so I will use data from 2017 for this company in particular. This will likely lead to some differences, so any major differences might be explained by this.

I have also collected information from the annual reports of Alliance Resource Partners LP for the years 2014-2022,
(Sec.gov, 2023)

5.3 Annual reports – Glencore

I have collected annual reports from Glencore from their website in order to find the relevant financials.

I have collected information from the annual reports 2022-2014. (Glencore.com, 2023)

5.4 Annual reports – China Shenhua Energy Corp.

I have collected annual reports from Shenhua Energy Corp as well. Since they are a Chinese company, I find the information I need about the financials directly from their annual report.

I have collected information about the years 2014-2022 from the relevant annual reports.
(Csec.com, 2023)

5.5 Annual reports – Yankuang energy group.

I collect the necessary financial data from the annual reports of Yankuan Energy, found on their website. (Yanzhoucoal.com, 2023)

5.6 ESG Risk ratings – Morningstar Sustainalytics

I collect ESG ratings for the 5 companies to see if they have high and similar scores as expected. I Have chosen Morningstars Sustainalytics as they have a good reputation among analysts and will use them for all the ESG risk ratings, so they are all measured using the same metrics and demands.

(Sustainalytics, 2023)

5.7 WACC Data

I decided to collect the WACC online as this thesis is not primarily a valuation thesis, and decide to get my information from “Valueinvesting.IO”, which is ranked as the number 1 best stock research website by the university of Columbia (Columbia.edu, 2023)

6. Expectations

Based on the theories for previous chapters the following expectations are had about the properties of the selected coal stocks.

6.1 Price

The price is expected to be on a descending path in general, but Reports from IEA (2022) makes the case for possible large short-term increases from the 2022 energy crisis. Expect some stocks to have their trajectory changed by the 2022 anomalous event, but it should be downwards trending on the chart excluding 2022.

It is expected that the price will have a fall during the late 2015 period, as that is when the Paris agreement was signed, and Rocha et al(2016)s research found evidence supporting it having a noticeable declining effect on the price of coal stock.

6.2 P/E Ratio

The expectations for my analysis of the coal companies will be that they will have a relatively low P/E ratio, as investors should price the industry with low growth in mind, considering the world's consensus on combating carbon emission, For example the Paris agreement or the European Green Deal. The way I will look at it is that expectations are A lower P/E at the end of the timeseries than at the start, and that the energy crisis shouldn't have a very noticeable impact as short term profitability isn't an indicator for growth for coal, because of its declining state.

6.3 Revenue Growth

The expectations for revenue growth are an increased revenue in 2022, and on average declining revenue outside of 2022. The reason for this is that the companies are not expected to grow, they are part of a low growth sector, and have large carbon associated risks.

The change in revenue vs Costs is expected to be in favor of revenue, as that means making the best decisions for the shareholders by the company. A larger cost increase than revenue could be a sign of bad decision making by the board, which are required to act in the shareholders best interests.

6.4 ESG risk score

The expectation for the ESG risk is that it is bad (High). Coal companies should have a high climate risk connected to their reliance on carbon emissions, and Chava (2011) and Berg (2022) makes a low ESG score (High ESG risk) connected to coal related companies.

6.5 WACC

Expectations for the WACC, which is used as the cost of capital is expected to be higher than the global industry average of 6,8% across all industries. This number is found by a Cost of Capital

study for 2022 done by KPMG Germany, which did an in-depth investigation of the WACC. (Schöniger et al, 2022)

As earlier theory by Bolton & Kacperczyk (2021) claims brown firms have a higher cost of capital, I would expect the WACC to be at least higher than the global average. Anything above 6.8% for 2022 would fit expectations, and anything below would be a surprise.

7. Results and Analysis.

7.1 Esg risk score analysis

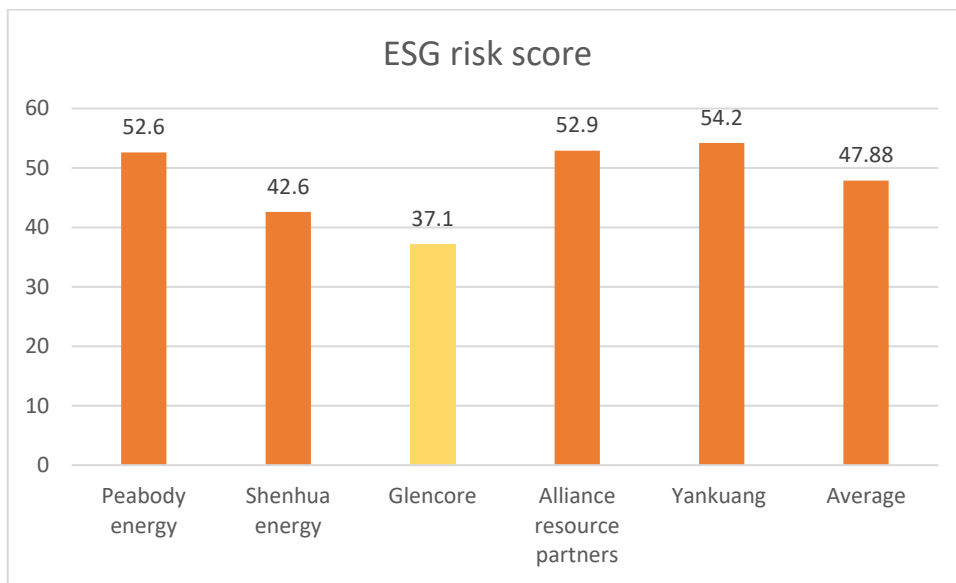


Figure 2 This figure shows the ESG risk ratings for the selected companies, as well as the average rating between them. Data collected from Morningstar Sustainalytics (2023)

ESG risk rating is measured in four stages, negligible (1-10), low 10-20, medium (20-30), high (30-40) and **severe** (40+)

The majority of the companies hold risk rating in the “severe” range, with only Glencore landing on a “high”. The average score is 47,88 which puts it well into severe ESG risk.

The ESG-Risk ratings found for the companies as seen in figure 2 match with expectations from Chava et al (2011) and Berg (2022), as the companies all display high ESG risk scores. Being at severe risk could be part of the reason why investors would shy away from the stocks, as they are

expected to die out in the coming years as the coal model with stop being a viable alternative as the switch to cleaner energy progresses further.

The highest score belongs to Yankuang energy, with a 54.2 risk score (SEVERE). The lowest score belongs to Glencore, with 37.1, putting them as the only company with “high” instead of “severe”

Its interesting to note that the scores differ by region, as the American companies score almost the same, with 52.6 and 52.9 for Peabody and ALRP respectively, and the Chinese companies have more of a spread with 54.2 and 42.6, but still remain in the same category of “severe”. The lowest is headquartered in the region with the most active climate resolutions, Europe, so the low score could maybe be attributed to a higher pressure on the company to conform to ESG standards. A 2019 article for ESGCLARITY by Jon Lappin shows China as lagging behind on ESG conscious implementations by companies, while Europe sets the standard (Lappin, 2019)

7.2 Price analysis

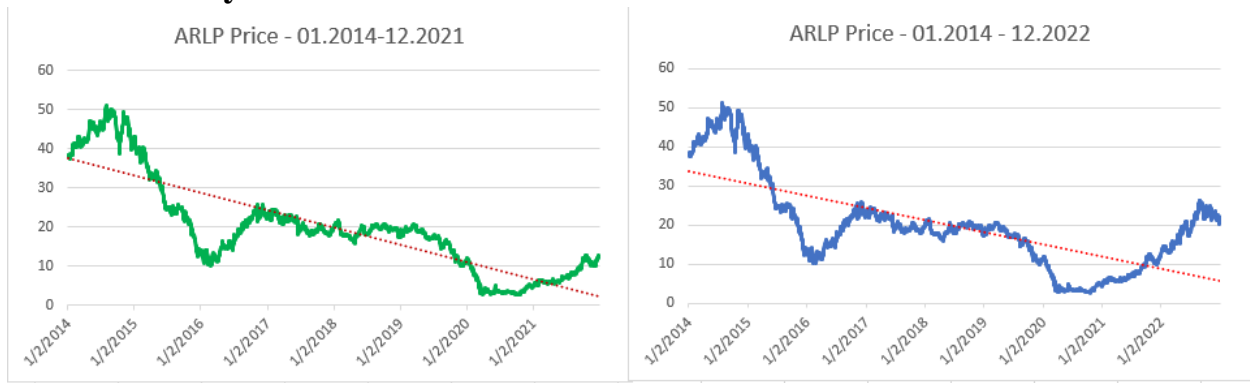


Figure 3 Alliance Resource Group – 2014-2021 and 2014-2022

The price of Alliance Resource Group can be seen in figure 3 as turning right around the time of the signing of the Paris agreement, as expectations predicted. The price is also further trending downwards as can be seen by the trendline, which is a good indicator that the company is in decline, which is the expected performance.

We can see that the stock had a comeback in 2022, which matches with the energy crisis, and shows a slightly higher trendline than the graph showing ARLP price excluding 2022. The stock

price is behaving as expected of a coal company, with steadily declining price with the exception of 2022.

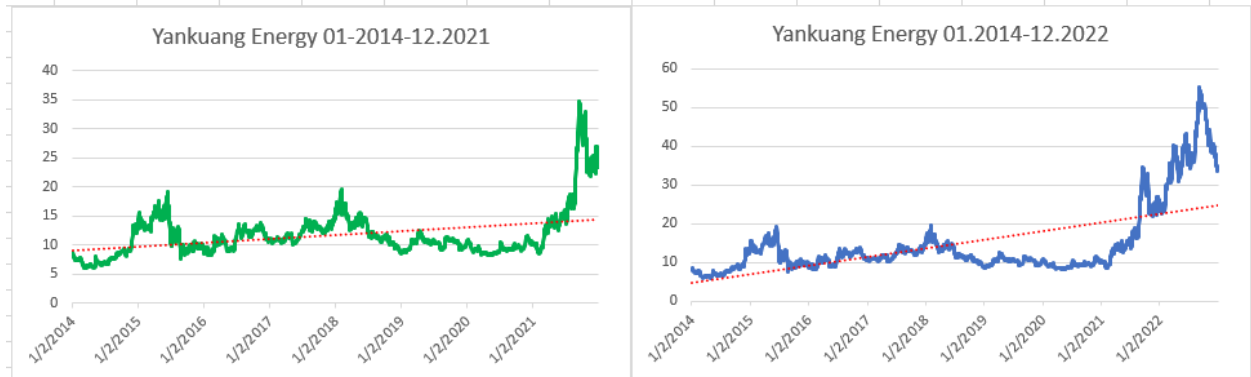


Figure 4 Yankuang energy 2014-2021 and 2014-2022

Yankuang energy is having a large jump as the energy crisis hit China, which shows the increased demand for coal to produce more energy. The price movement is not trending downwards, even if you ignore the energy crisis induced bump, which does not fit with the expectation of coal heading towards extinction.

This warrants further investigation, as the price development does not fit with the theory, which could be done in future research.

The Price of Yankuang does not reflect the state of coal as a dying sector, and fails to meet expectations.



Figure 5 Glencore price 2014-2021 and 2014 - 2022

Figure 5 shows Glencore had a Large drop after the signing of the Paris agreement as expected with the findings from Banga (2018), However, it has since had large ups and downs, which could be interesting to explore further. The trend is down of you exclude the abnormal energy crisis of 2022, which fits expectations, but it actually gained enough momentum from the crisis to turn a positive overall trend if you include 2022 in the analysis.

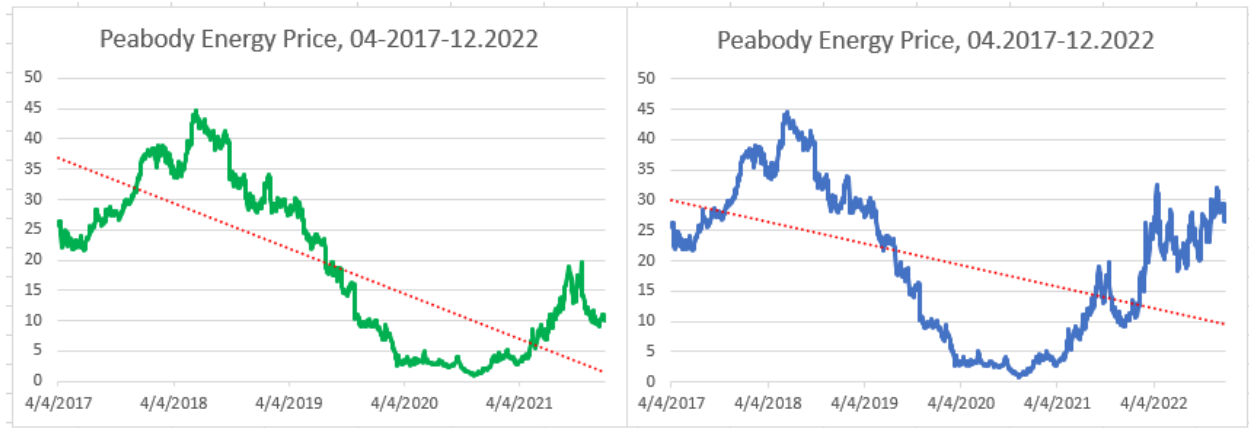


Figure 6 Peabody price 2017-2022

Peabody only has price data from a period between 2017-2022, so it is more prone to abnormal or unexpected results due to the smaller sample. However, it looks like it performs as expected, with a descending trendline, and a boost from the 2022 energy crisis. Even with the 2022 boost it still has an overall declining outlook, which is a reflection on the fact that most countries try to ban coal over time, by way of the Paris agreement and other green deals.

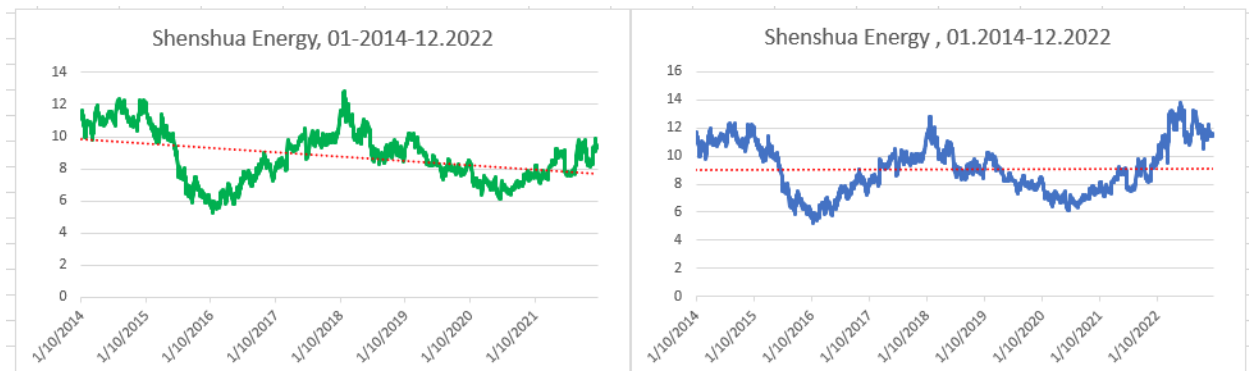


Figure 7

Figure 7 shows the price of Shenhua, which performs pretty well while still remaining within the expectations of a declining sector. The decline is very gradual, and they even turn it slightly positive with the additional price boost from the energy crisis.

Overall, it is seen from these figures that the Chinese coal companies are performing the strongest and are the furthest away from expectations.

The Chinese firms provide a higher stock price than expected, as there is not even a declining trend for Yankuang Energy when excluding 2022. This could indicate that the stock price doesn't reflect the true situation of the coal sector and its future, and thus fails to meet expectations.

On the other side, the US based companies Peabody Energy and Alliance Resource Partners best fit with the predictions of a declining a poor performing trend after the world started moving towards carbon neutrality.

The European based international company performs somewhere in the middle, not as low as expected, but not high enough to be a surprise either.

In order to try to understand why there are such large differences between the performance of the Chinese and American coal firms, we must look at the report “Coal 2022” by the International Energy Agency. The report shows that the demand for coal is much higher in china, as it accounts for 53% or the worlds coal consumption. This is caused by the Chinese having less renewable energy alternatives built yet, compared to the US. Chinas power sector alone is responsible for a third of the worlds coal usage, so having a large share of that market like Shenhua Energy and Yankuan Energy has, leads to a large advantage over the US firms, where the demand is lower, and dying out faster (IEA, 2023, “Coal 2022”)

7.3 Growth

	2014 - 2022				2017-2022
	Yankuang	ALRP	Shenhua	Glencore	Peabody
Average Rev growth	16.34%	3.30%	4.16%	4.00%	4.80%
Average Operating cost growth	9.93%	0.86%	0.77%	2.65%	-1.94%
Average Change Rev Vs Costs	6.41%	2.45%	3.39%	1.35%	6.75%

Table 1 Shows the average growths in revenue and operating costs for the companies during the period 2014-2022 for all except Peabody energy, which it shows data for 2017-2022 instead. For calculations please see appendix.

	2014 - 2021				2017-2021
	Yankuang	ALRP	Shenhua	Glencore	Peabody
Average Rev growth	13.09%	-2.94%	4.35%	1.29%	-4.26%
Average Operating cost growth	8.96%	-2.71%	0.21%	0.54%	-8.11%
Average Change Rev Vs Costs	4.13%	-0.23%	4.14%	0.75%	3.85%

Table 2 This table shows the same as Table 1 but with 2022 excluded. See appendix for individual calculations for each firm and extended information from revenue growth YoY.

Table 1 and 2 show growths in revenue and costs. The Expected outcome for the 2014-2022 period, which includes the 2022 energy crisis's short term boost effect on coal stock, is expected to have growths in revenue because of the crisis.

The change in revenue vs costs is in favor of revenue, which is the expected result

On the other hand, when excluding 2022 only two of the companies have negative average revenue growth, and it's the American ones, these are confirming with expected results.

What is not compliant with expectations however, is the 2014-2021 revenue growths for Yankuang, Shenhua and Glencore, which all have a growth in revenue even when excluding. Expectations say that lower demand for coal and more measures against it should lead to lower revenues, but the results are not following that expectation.

This could warrant further research to figure out why.

Interestingly, Shenhua had a lower average growth when including 2022, which means it actually increased costs more than it increased revenues for 2022. This could be explained by the fact that China had their energy crisis in 2021 as well, so strong performance the year before might have led to them spending more on gearing up for max production in 2022, which turned out to not provide a benefit. This is speculation of course, but it would be a plausible reason behind the occurrence.

Since the same did not happen for Yankuang Energy, they had a great revenue increase in 2022, I will assume that it is an unexpected outcome with Shenhua, that does not match expectations.

7.4 P/E Ratios

PE Ratios Peabody energy (USD)									
	2022	2021	2020	2019	2018	2017			
Stock price	26.42	10.07	2.41	9.12	28.64	36.99			
EPS	8.31	3.22	-19.14	-2.04	4.43	1.31			
PE Ratios	3.18	3.13	-0.13	-4.47	6.47	28.24			
Average PE for period						6.07			
PE Ratios Yangkuang (RMB)									
	2022	2021	2020	2019	2018	2017	2016	2015	2014
Stock price	33.58	25.41	10.07	10.56	8.78	14.52	10.86	9.45	13.18
EPS	6.15	3.48	1.29	1.91	1.75	1.31	0.34	0.03	0.16
PE Ratios	5.46	7.30	7.81	5.53	5.02	11.08	31.94	315.00	82.38
Average PE for period									52.39
PE Ratios Glencore (USD)									
	2022	2021	2020	2019	2018	2017	2016	2015	2014
Stock price	6.625	5.09	3.15	3.07	3.632	5.23	3.396	1.36	4.58
EPS	2.64	0.76	-0.28	-0.06	0.48	0.82	0.2	-0.74	0.36
PE Ratios	2.51	6.70	-11.25	-51.17	7.57	6.38	16.98	-1.84	12.72
Average PE for period									-1.27
PE Ratios Shenshua (RMB)									
	2022	2021	2020	2019	2018	2017	2016	2015	2014
Stock price	11.46	9.33	7.47	8.33	8.64	10.38	7.39	6.23	11.9
EPS	3.669	2.588	1.803	2.097	2.219	2.403	1.252	0.887	1.976
PE Ratios	3.12	3.61	4.14	3.97	3.89	4.32	5.90	7.02	6.02
Average PE for period									4.67
PE Ratios ALRP (RMB)									
	2022	2021	2020	2019	2018	2017	2016	2015	2014
Stock price	20.32	12.64	4.48	10.82	17.34	19.7	22.45	13.49	43.05
EPS	4.39	1.36	-1.02	3.07	2.74	2.8	3.39	2.11	4.77
PE Ratios	4.63	9.29	-4.39	3.52	6.33	7.04	6.62	6.39	9.03
Average PE for period									5.38

Table 3 Stock Price is the last traded price for the year,

Color coding is Yellow as the benchmark: starting point. Higher PE than benchmark = RED because it is outside expectations, expect PE to fall as company should be in declining state thanks to the dismantling of coal. Green = Within expectations as its lower than the benchmark, which means it has dropped since 2014 before the signing of the paris agreement.

Grey = Negative PE means the company is losing money during this period. This tells us that the company is performing poorly during this period.

Table 3 Shows that all the companies performed closes to the expected of having a Peak P/E in the start of the period and a lower P/E at the end, in 2022.

The 9.29 P/E of Alliance Resource Partners in 2021 is surprising, as it is higher than it was in 2014. This does not meet the expected outcome of the P/E during that year, but it comes straight

back to acceptable level the next period in 2022. I am not certain why investors would price it for growth during this period, but that could warrant future research.

By looking at the 2022 P/E, it shows that the P/E has declined for four of the five companies from 2021, even with increases in the share price. This means that investors are not expecting future growth from the company as a result of the price increase during 2022, which points back to the energy crisis being a short-term event that does not affect the value of the stock in the long term, even if it gives it a price and revenue jump for the period. This falls in line with theory about the energy crisis only having a short-term effect, as Bauer et al(2022) and the IEA (2022) finds.

Only Peabody has a higher P/E after 2022 compared to 2021, however the increase is very small at only a 0.05 Dollar price increase per EPS compared to 2021. To explain it, looking at the previous years where they lost money (Negative P/E) during 2020 and 2019, and having turned profitable again in 2021 could still carry momentum into 2022, and the increase could be from that turnaround still not being completely priced in.

7.5 WACC

WACC (Estimates from Valueinvestor.io and Finbox.com)					
	ARLP	Glencore	Shenhua	Yankuang	Peabody
Low	6.90%	8.60%	7.75%	9.50%	9%
Mid	8.00%	9.70%	8.25%	10.50%	9.75%
High	9.00%	10.70%	8.75%	11.50%	10.25%

Table 4 Shows the cost of capital estimated for each of the five companies

The expectations from the WACC fits perfectly with expected results of having a higher than average cost of capital. Even at the lowest estimate, the lowest cost of them all is at 6.90%, which is still above the global average of 6,80%. This is supporting evidence for the theories of Chava et al (2011) and Breuer et al (2018) and is evidence towards proving that coal is heading for its downfall. This high cost of capital does mean that it’s harder for coal to find investors,

indicating institutional divestment like Breuer (2018) expected.

8. Conclusion

The goal of the thesis remained to examine the representative stocks to see if everything lines up with expected results. Relevant theories are looked at, listed and combined to create an objective for expectations of properties in five selected stocks. The stocks are from three different areas of the world, which is done to create a wider net of research, making sure to give a more accurate reflection of the true state of coal.

The theories help give an expected answer to the research question of whether the price and properties of coal related stocks properly reflect the inevitable decline of coal.

The expectations line up with existing theories in *most* of the examined traits, and this gives strengthening support to the theories that coal is going down against the greener stocks. Theories about ESG, Cost of capital,

The expectations fit perfectly in the case of WACC, the cost of capital.

Theories about price has some hiccups but given the circumstances of the events which provide the issues, and looking at a possible version without them, the price is not far off the expected result in the majority of the cases.

The most important part is, does this paper answer to the question ““Do Coal stocks sufficiently reflect the shift towards sustainable energy and net zero emissions?”. The results are leaning towards a yes, based on the findings and confirmations found in this paper, however, there is not sufficient evidence found in this paper to give it a definitive yes. I believe that this paper provides findings that brings us one step closer to finding out at least, but since some of the findings do not line up with expectations, those point towards the coal stocks not reflecting the shift to sustainable energy.

It is at least clear to see that there are a much larger number of properties that landed within the

expected values, so the indication is that the coal stocks reflect the shift in a major way. Whether or not that is sufficient is up for debate.

This paper has added some new insights on the performance of coal stocks for the period 2014-2022, in some key chosen metrics.

8.1 Limitations and shortcomings

There are several limitations to my approach for solving the issue of ““Do Coal stocks sufficiently reflect the shift towards sustainable energy and net zero emissions?””

Among them are a low period sample, a low sample size of companies and a limited region selection.

A larger number of companies would ensure a lower possibility of outliers. For example, having the largest 5 or 10 per region, as well as including other regions like African mining companies is something that would help the result become better.

Another limitation comes from the fact that the shift to green energy and the goals it tries to reach is still happening, so it's not really feasible to measure if coal will end up in the place the environmental agreements want it to, I can only speculate based on indication from my results and relevant theories.

Expanding the thesis to encompass a larger timeframe would also lead to a better overview of each stock's individual development and might help bring more clarity to whether the stock reflects the shift or not.

8.2, Future research.

This paper, while providing reinforcement to existing theories, does not do in depth valuations and go deep under the hood of the companies to examine and find avenues for new discoveries.

A future research option could be to do deeper examinations of all parts of this study, to provide even further evidence towards some of the theories or find evidence that opposes them.

Exploring what happens to the coal stocks as we edge ever closer to the critical years of the Paris Agreement is very exciting and could likely be worth examining. The most critical moments would be observing if the 2025 Peak (Latest) for coal production would be kept, if the reduction goals for 2030 was reached and finally in 2050 to see if the goal of carbon neutrality is actually reached.

The amount on attributes that are checked against expectations could be expanded upon, as well as the link between them. This could give new insights to help answer if coal stocks are priced as expected.

Lastly, it would be good to research the anomalous results from this thesis, to figure out why they do not fit expectations. What happened, and why do they behave the way they do?

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Appendix

Table of Appendix figures and tables

Fig 1: Collected from **Banga**, Josué. (2018). The green bond market: a potential source of climate finance for developing countries. Journal of Sustainable Finance & Investment. 9. DOI:10.1080/20430795.2018.1498617.

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Full excel data files can be provided upon request.

PEABODY ENERGY CORP FINANCIALS (in Millions, USD)								
	2022	2021	2020	2019	2018	2017	Average	
Revenue	4981.9	3318.3	2881.1	4623.4	5581.8	5578.8	4494.22	
Revenue Growth	50.13%	15.17%	-37.68%	-17.17%	0.05%	18.31%	4.80%	
Operating cost and expenses	3290.8	2553.1	2524.9	3536.6	4071.4	3995.3	3328.68	
Operating cost growth	28.89%	1.12%	-28.61%	-13.14%	1.90%	-1.84%	-1.94%	
Change Rev vs Cost	21.24%	14.06%	-9.08%	-4.03%	-1.85%	20.15%	6.75%	
Color coded Green = Revenue grew more than costs, Red = Costs grew more than Revenue								

Appendix fig 1 Revenue growth and operating cost growth calculated for the years 2017-2022 from annual report data from Peabody Energy Corp. Was off public exchanges until April 2017 after a bankruptcy some years prior, so data included is only from 2017 and onwards. Growth from 2016-2017 is based on numbers from the 2017 annual report, which lists revenue for 2016.

Shenhua Energy corp (In Millions, RMB)										
	2022	2021	2020	2019	2018	2017	2016	2015	2014	Average
Revenue	344,533	335,640	233263	241871	264101	248746	183127	177069	253081	253,492
Revenue Growth	2.65%	43.89%	-3.56%	-8.42%	6.17%	35.83%	3.42%	-30.03%	-12.50%	4.16%
Operating cost and other expense	173677	164979	162374	239805	226,624	160460	124843	123341	178109	172,690
Operating cost growth	5.27%	1.60%	-32.29%	5.82%	41.23%	28.53%	1.22%	-30.75%	-13.69%	0.77%
Change Rev vs Cost	-2.62%	42.28%	28.73%	-14.23%	-35.06%	7.30%	2.20%	0.72%	1.19%	3.39%
Color coded Green = Revenue grew more than costs, Red = Costs grew more than Revenue										

Appendix fig 2 Revenue growth and operating cost growth calculated for the years 2014-2022 from annual report data from Shenhua energy corp.

Glencore (in Millions, USD)										
	2022	2021	2020	2019	2018	2017	2016	2015	2014	Average
Revenue	255,984	203,751	142338	215111	220524	205376	152948	170497	221073	198,622
Revenue Growth	25.64%	43.15%	-33.83%	-2.45%	7.38%	34.28%	-10.29%	-22.88%	-4.99%	4.00%
Operating cost and other expense	228,723	191,370	138,640	210,434	211,468	197,695	149,763	166,982	214,344	189,935
Operating cost growth	19.52%	38.03%	-34.12%	-0.49%	6.97%	32.01%	-10.31%	-22.10%	-5.64%	2.65%
Change Rev vs Cost	6.12%	5.11%	0.29%	-1.97%	0.41%	2.27%	0.02%	-0.78%	0.64%	1.35%
Color coded Green = Revenue grew more than costs, Red = Costs grew more than Revenue										

Appendix fig 3 Revenue growth and operating cost growth calculated for the years 2014-2022 from annual report data from Glencore

Yankuang energy (Millions I RMB)											
	2022	2021	2020	2019	2018	2017	2016	2015	2014	Average	
Revenue	154,602	108,616	69123	67805	67447	52672	33272	36404	60371	72,257	
Revenue Growth	42.34%	57.13%	1.94%	0.53%	28.05%	58.31%	-8.60%	-39.70%	7.04%	16.34%	
Operating cost	80,815	68,680	55,031	46,775	43,141	33,757	23,808	30,250	52,530	48,310	
Operating cost growth	17.67%	24.80%	17.65%	8.42%	27.80%	41.79%	-21.30%	-42.41%	14.91%	9.93%	
Change Rev vs Cost	24.67%	32.33%	-15.71%	-7.89%	0.25%	16.52%	12.69%	2.71%	-7.87%	6.41%	
Color coded Green = Revenue grew more than costs, Red = Costs grew more than Revenue											

Appendix fig 4: Revenue growth and Operating cost growth calculated for the years 2014-2022 from the annual report data from Yankuang Energy Group.

Alliance resource partners (Millions in USD)											
	2022	2021	2020	2019	2018	2017	2016	2015	2014	Average	
Revenue	2,406	1,570	1328	1962	2003	1796	1931	2274	2301	1,952	
Revenue Growth	53.25%	18.22%	-32.31%	-2.05%	11.53%	-6.99%	-15.08%	-1.17%	4.35%	3.30%	
Operating cost	1,748	1,351	1,410	1,702	1,631	1,464	1,565	1,912	1,765	1,616	
Operating cost growth	29.39%	-4.18%	-17.16%	4.35%	11.41%	-6.45%	-18.15%	8.33%	0.17%	0.86%	
Change Rev vs Cost	23.86%	22.41%	-15.16%	-6.40%	0.12%	-0.54%	3.06%	-9.50%	4.18%	2.45%	
Color coded Green = Revenue grew more than costs, Red = Costs grew more than Revenue											

Appendix fig 5: Revenue growth and Operating cost growth calculated for the years 2014-2022 from the annual report data from Alliance Resource Partners.

Consolidated Financial Statements

CONSOLIDATED STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

For the year ended 31 December 2016

NOTES	2016 RMB'000	2015 RMB'000	2014 RMB'000	
Gross sales of coal	7	29,295,367	32,875,951	58,539,353
Railway transportation service income		287,355	327,311	373,617
Gross sales of electricity power		572,522	598,608	241,490
Gross sales of methanol		2,445,689	2,264,749	1,195,458
Gross sales of heat supply		12,399	27,549	20,846
Gross sales of equipment manufacturing		659,100	309,918	-
Total revenue		33,272,432	36,404,086	60,370,764
Transportation costs of coal	7	(1,810,092)	(2,078,902)	(2,291,594)
Cost of sales and services provided	8	(19,123,956)	(25,838,279)	(49,557,502)
Cost of electricity of power		(473,891)	(476,513)	(159,724)
Cost of methanol		(1,851,761)	(1,535,828)	(869,294)
Cost of heat supply		(5,796)	(13,353)	(11,236)
Cost of equipment manufacturing		(542,948)	(307,600)	-
Total cost of sales		(23,808,444)	(30,250,475)	(52,889,350)
Gross profit		9,463,988	6,153,611	7,481,414
Selling, general and administrative expenses	9	(7,788,733)	(5,696,704)	(6,069,884)
Share of profit of associates	27	708,368	502,364	310,604
Share of loss of joint ventures	30	(10,366)	(170,458)	(320,829)
Other income and gains	10	2,822,871	2,317,855	2,382,186
Finance cost	11	(2,501,016)	(2,484,411)	(2,183,581)
Profit before tax	13	2,695,112	622,257	1,599,910
Income tax expenses	12	(816,908)	(489,637)	(1,112,807)
Profit for the year		1,878,204	132,620	487,103
Attributable to:				
Equity holders of the Company		1,649,391	164,459	766,158
Owners of perpetual capital securities	44	424,307	346,227	36,456
Non-controlling interests				
– Perpetual capital securities	44	67,353	140,593	82,079
– Other		(262,847)	(518,659)	(397,590)
		1,878,204	132,620	487,103
Earnings per share, basic and diluted	16	RMB0.34	RMB0.03	RMB0.16
Earnings per American Depositary Shares ("ADS", one ADS represents 10 H shares), basic and diluted	16	RMB3.36	RMB0.33	RMB1.56

Appendix fig X – Example of financial statement used to find key financial data. This one is from the 2016 annual report for Yankuang Energy Group. (Yangzhoucoal.com, 2023)- Direct link: <http://www.yanzhoucoal.com.cn/2017-04/06/001f3b45a81f1a50552909.pdf>