ESG & Impact Investing – Assignment 1: Vail Resorts Quantitative Analysis

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# Set-up steps
import pandas as pd
import numpy as np
import warnings
import textwrap
from pandas.errors import SettingWithCopyWarning

warnings.filterwarnings("ignore", category=SettingWithCopyWarning)
esg_df = pd.read_csv("Assignment 1/Assignment_1.csv")
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# Organizing our data to manageable levels (a)
target_company = "Vail Resorts Inc"

select_attributes = {'Consumer Cyclicals', 'Cyclical Consumer Services', 'Hotels & Entertainm
select_peers_df = esg_df[(esg_df['TRBC Economic Sector Name'].isin(select_attributes)) &
                         (esg_df['TRBC Business Sector Name'].isin(select_attributes)) &
                         (esg_df['TRBC Industry Group Name'].isin(select_attributes))
                ]

# checking for how complete the data is
select_peers_df.loc[:, 'Percent_Missing'] = select_peers_df.isnull().sum(axis=1) / len(selec

# once we know how much of the data is missing, we will pull the companies with the least am
select_peers_df_sorted = select_peers_df.sort_values(by='Percent_Missing')
top10_selectedcomp = select_peers_df_sorted.head(11)

target_company_data = select_peers_df[select_peers_df['Company Common Name'] == target_compa
top10_selectedcomp = top10_selectedcomp.iloc[:-1]
top10_selectedcomp = pd.concat([top10_selectedcomp, target_company_data])
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# outputting our results
max_line_length = 80
company_names = ', '.join(top10_selectedcomp['Company Common Name'].tolist())
wrapped_names = textwrap.fill(company_names, width=max_line_length)

print(f"There are {len(select_peers_df)} possible comparable companies to explore.")
print(f"Our 10 companies of study will be: \n{wrapped_names}")
```

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There are 70 possible comparable companies to explore.
Our 10 companies of study will be:
Las Vegas Sands Corp, Wyndham Hotels & Resorts Inc, McDonald's Corp, Marriott
International Inc, Expedia Group Inc, Starbucks Corp, MGM Resorts International,
Planet Fitness Inc, Travel + Leisure Co, Cheesecake Factory Inc, Vail Resorts
Inc
```

The rationale for the proces above is to isolate the companies that are comparable to Vail Resorts in terms of their TRBC designations. This filtration process produced 70 companies, from which I sorted to find the companies with the most available ESG data and selected the top 10 to allow for easier comparison in the rest of this analysis.

Identifying Select Key ESG Metrics (b)

1) Scope 1 Emissions Cross-Comparison (E)
2) Proportion of Energy from Responsible Sources (E)
3) Gender & Social Equity in Leadership Index (S)
4) Employee Quality Experience Index (S)
5) Total Debt to Total Equity (G)

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# Data analysis on key ESG Metrics (c) - Scope 1 Emissions
import matplotlib.pyplot as plt
import re

# fixing the emissions values to the relevant years
def extract_years(df):
    years = []
    for col in df.columns:
        match = re.search(r"(\d{4})", col)
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        if match:
            years.append(int(match.group(1)))
    return sorted(list(set(years)))

def get_emissions_data(df, years):
    emissions_data = {}
    for index, row in df.iterrows():
        company = row['Company Common Name']
        emissions = []
        for year in years:
            for col in df.columns:
                match = re.search(r"(\d{4})", col)
                if match and int(match.group(1)) == year:
                    emissions.append(df.loc[index, col])
                    break
            else:
                emissions.append(None)  # Handle missing years
        emissions_data[company] = emissions
    return emissions_data

# testing the years and setting targets
selected_years = extract_years(top10_selectedcomp)
selected_emissions = get_emissions_data(top10_selectedcomp, selected_years)
target_company = "Vail Resorts Inc"

# plotting
plt.figure(figsize=(12, 6))
for company, emissions in selected_emissions.items():
    if company == target_company:
        plt.plot(selected_years, emissions, color="darkblue", linewidth=3, label= target_comp
    else:
        plt.plot(selected_years, emissions, color="maroon", alpha=0.5, linewidth=1, label= '(

plt.xlabel("Year", fontsize=12)
plt.ylabel("CO2 Equivalent Emissions", fontsize=12)
plt.title(f"CO2 Emissions Comparison Between Peer Companies and {target_company}", fontsize=
plt.xticks(selected_years, rotation=45, ha="right", fontsize=10)
plt.yticks(fontsize=10)
plt.grid(True, linestyle="--", alpha=0.7)
plt.legend(fontsize=10)
plt.tight_layout()
plt.gca().ticklabel_format(style='plain', axis='y')
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plt.show()
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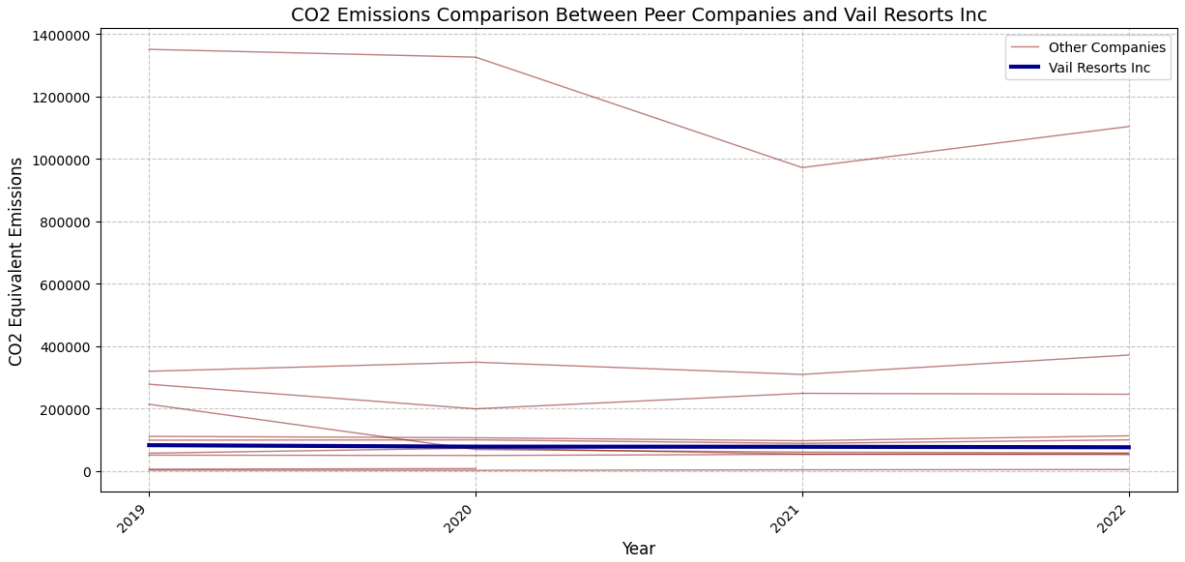


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# Data analysis on key ESG Metrics (c) - Proportion of Energy from Responsible Sources
top10_selectedcomp['energy_comp'] = top10_selectedcomp['Renewable Energy Purchased']/top10_se

target_company = "Vail Resorts Inc"

# Plotting
plt.figure(figsize=(10, 6))
for company in top10_selectedcomp['Company Common Name']:
    color = 'maroon'  # Default color for other companies
    if company == target_company:
        color = 'darkblue'  # Target company color

    ratio = top10_selectedcomp[top10_selectedcomp['Company Common Name'] == company]['energy_
    plt.bar(company, ratio, color=color)

plt.xlabel("Company")
plt.ylabel("Renewable Energy Ratio (0-1)")
plt.title("Renewable Energy Sourcing Ratio Comparison Across Companies")
plt.xticks(rotation=45, ha= 'right')
plt.ylim(0, 1)
plt.tight_layout()

# Add values on top of bars
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for company in top10_selectedcomp['Company Common Name']:
    ratio = top10_selectedcomp[top10_selectedcomp['Company Common Name'] == company]['energy_
    percentage = ratio * 100
    plt.text(company, ratio, f"{percentage:.0f}%", ha='center', va='bottom')

plt.show()
```

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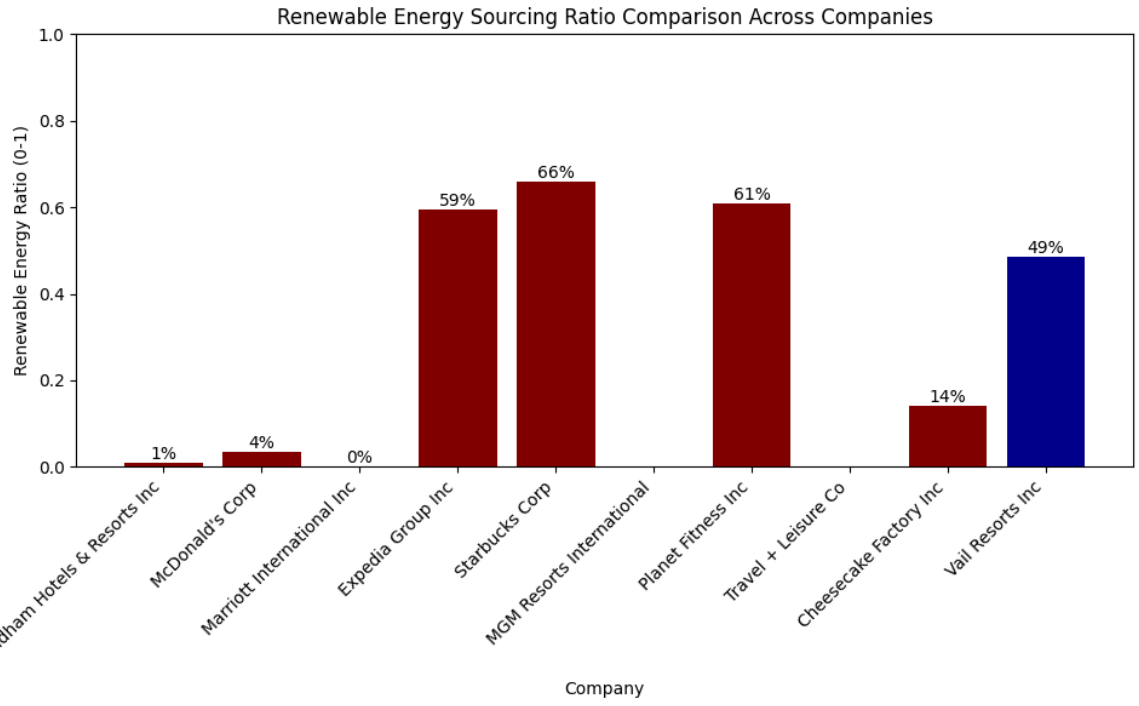


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# Data analysis on key ESG Metrics (c) -- Gender & Social Equity in Leadership Index
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# Data analysis on key ESG Metrics (c) -- Employee Quality Experience Index
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# Data analysis on key ESG Metrics (c) -- Total Debt to Total Equity
target_company = "Vail Resorts Inc"

# Plotting
plt.figure(figsize=(10, 6), dpi= 50)
for company in top10_selectedcomp['Company Common Name']:
    color = 'maroon'  # Default color for other companies
    if company == target_company:
        color = 'darkblue'  # Target company color

    ratio = top10_selectedcomp[top10_selectedcomp['Company Common Name'] == company]['Total
    plt.bar(company, ratio, color=color)

plt.xlabel("Company")
plt.ylabel("Total Debt to Total Equity, Percent")
plt.title("Total Debt to Total Equity Ratio Comparison Across Companies")
plt.xticks(rotation=45, ha= 'right')
plt.ylim(0, 1)
plt.tight_layout()

# Add values on top of bars
for company in top10_selectedcomp['Company Common Name']:
    ratio = top10_selectedcomp[top10_selectedcomp['Company Common Name'] == company]['Total
    percentage = ratio * 100
    plt.text(company, ratio, f"{percentage:.0f}%", ha='center', va='bottom')

plt.show()
```