ESG_Benchmarking

August 25, 2025

[1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from pathlib import Path
```

[9]:
```
DATA = Path("/Users/shashi/Desktop/ESG Data Benchmarking/DATA/ESG Risk Ratings.
↪csv") # <- change filename
out = Path("outputs"); out.mkdir(exist_ok=True, parents=True)
```

[17]:
```
df = pd.read_csv(DATA)
```

[15]:
```
# --- minimal clean-up (edit column names below to match your file) ---
# Expected columns (rename if needed):
# Company, Sector, Country, Emissions_tCO2e, Diversity_Pct, Governance_Score
df = df.rename(columns={
    'company':'Company','sector':'Sector','country':'Country',
    'emissions':'Emissions_tCO2e','diversity':'Diversity_Pct',
    'governance':'Governance_Score'
})
```

[21]:
```
print(df.columns.tolist())
```

```
['Symbol', 'Name', 'Address', 'Sector', 'Industry', 'Full Time Employees',
'Description', 'Total ESG Risk score', 'Environment Risk Score', 'Governance
Risk Score', 'Social Risk Score', 'Controversy Level', 'Controversy Score', 'ESG
Risk Percentile', 'ESG Risk Level']
```

[23]:
```
# Rename columns to standard form
df = df.rename(columns={
    'Name': 'Company',
    'Sector': 'Sector',
    'Environment Risk Score': 'E_score',
    'Social Risk Score': 'S_score',
    'Governance Risk Score': 'G_score',
    'Total ESG Risk score': 'ESG_total'
})
```

[25]:
```
print(df.columns.tolist())
```

```
['Symbol', 'Company', 'Address', 'Sector', 'Industry', 'Full Time Employees',
'Description', 'ESG_total', 'E_score', 'G_score', 'S_score', 'Controversy
Level', 'Controversy Score', 'ESG Risk Percentile', 'ESG Risk Level']
```

[27]:
```
# Drop rows with missing ESG scores
df = df.dropna(subset=['Company', 'Sector', 'E_score', 'S_score', 'G_score'])
```

[43]:
```
df[['Company', 'Sector', 'E_score', 'S_score', 'G_score', 'ESG_composite']].
 ↪head()
```

[43]:

	Company	Sector	E_score	S_score	G_score	ESG_composite
1	Eastman Chemical Company	Basic Materials	12.8	5.8	6.6	91.6
2	Domino's Pizza Inc.	Consumer Cyclical	10.6	12.2	6.3	90.3
4	Davita Inc.	Healthcare	0.1	14.1	8.4	92.5
5	Darden Restaurants, Inc.	Consumer Cyclical	7.9	15.0	4.6	90.8
6	Zoetis Inc.	Healthcare	3.2	6.8	8.7	93.8

[29]:
```
# Compute composite ESG score (lower risk = better)
df['ESG_composite'] = (100 - df[['E_score','S_score','G_score']].mean(axis=1)).
 ↪round(1)
```

[49]:
```
df['ESG_composite']
```

[49]:
```
1      91.6
2      90.3
4      92.5
5      90.8
6      93.8
       …
498    96.7
499    90.0
500    91.7
501    91.5
502    87.6
Name: ESG_composite, Length: 430, dtype: float64
```

[31]:
```
# --- Top 10 companies ---
top10 = df[['Company','Sector','ESG_composite']].sort_values('ESG_composite',␣
 ↪ascending=False).head(10)
```

[51]:
```
top10
```

[51]:
```
                                    Company                 Sector  \
288                            Hasbro, Inc.       Consumer Cyclical
240            Keysight Technologies, Inc.              Technology
409                       Cbre Group, Inc.             Real Estate
408                        Cdw Corporation              Technology
498                          Accenture Plc              Technology
451            Avalonbay Communities, Inc.             Real Estate
137                          Prologis, Inc.             Real Estate
371                       Crown Castle Inc.             Real Estate
69   The Interpublic Group of Companies, Inc.  Communication Services
282       Hewlett Packard Enterprise Company              Technology

     ESG_composite
288           97.6
240           97.4
409           97.3
408           96.9
498           96.7
451           96.7
137           96.6
371           96.6
69            96.6
282           96.5
```

[33]:
```
# --- Sector averages ---
sector = df.groupby('Sector')[['E_score','S_score','G_score','ESG_composite']].
 ↪mean().round(1)
```

[53]:
```
sector
```

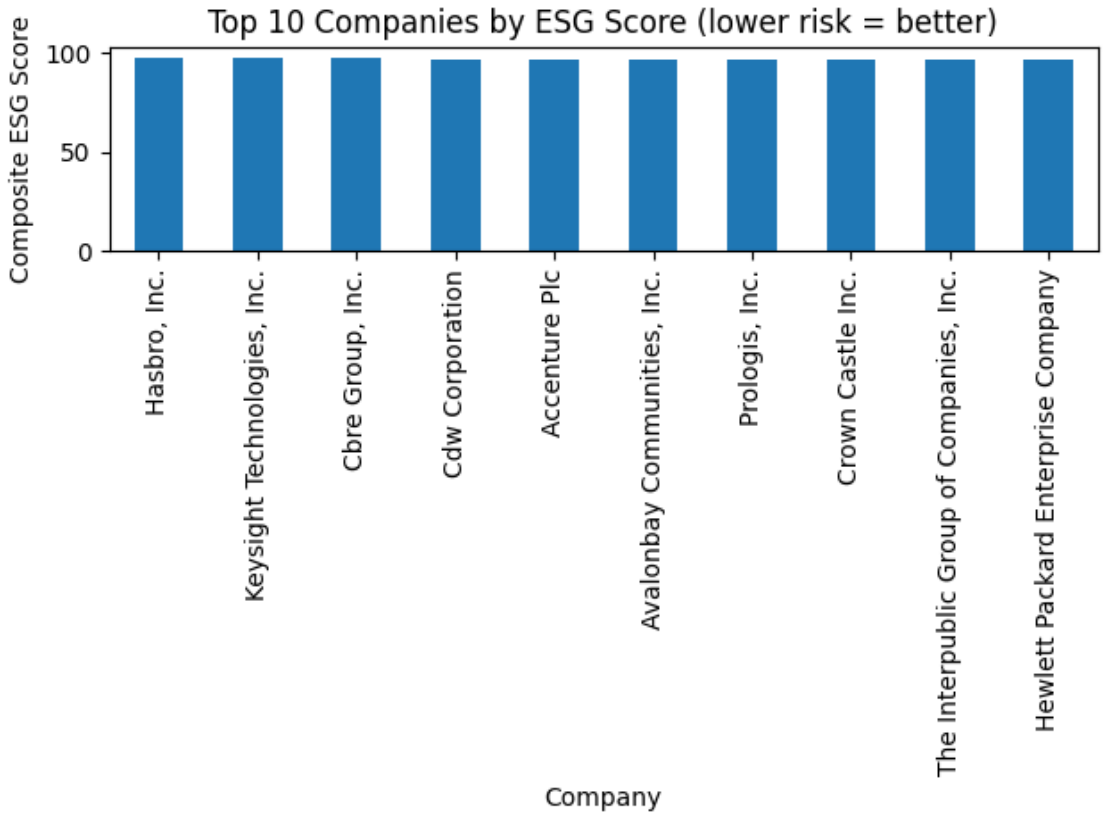
[53]:
```
                        E_score  S_score  G_score  ESG_composite
Sector
Basic Materials            12.6      7.5      6.6           91.1
Communication Services      1.9     10.1      7.4           93.5
Consumer Cyclical           5.3      8.4      5.6           93.6
Consumer Defensive          8.7     10.8      5.9           91.5
Energy                     16.9      8.9      6.5           89.2
Financial Services          1.4      9.6     10.1           92.9
Healthcare                  1.8     11.5      7.3           93.1
Industrials                 7.1     10.8      6.1           92.0
Real Estate                 3.7      3.6      5.8           95.6
Technology                  4.3      6.9      5.8           94.4
Utilities                  11.8      9.4      5.5           91.1
```

[35]:
```
# Save results
out = Path("outputs"); out.mkdir(exist_ok=True, parents=True)
top10.to_csv(out/'top10_companies.csv', index=False)
```

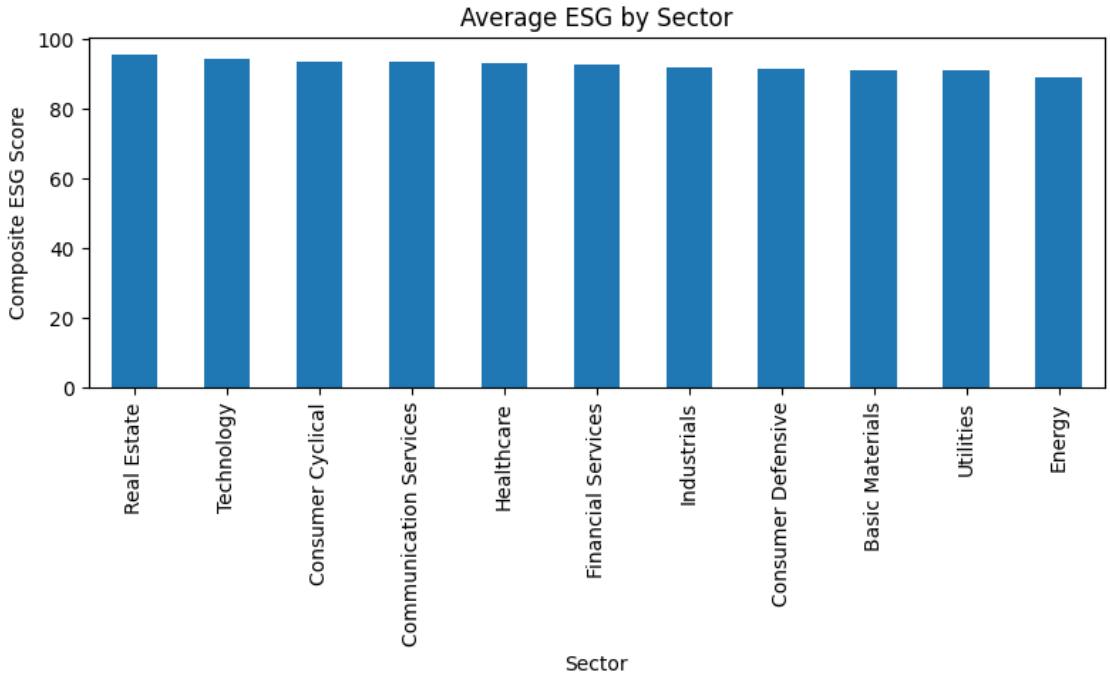
```
sector.to_csv(out/'sector_summary.csv')
```

[37]:
```
# --- Plots ---
plt.figure(figsize=(8,5))
top10.plot(x='Company', y='ESG_composite', kind='bar', legend=False)
plt.title("Top 10 Companies by ESG Score (lower risk = better)")
plt.ylabel("Composite ESG Score")
plt.tight_layout()
plt.savefig(out/'top10_esg.png', dpi=200)
```

```
<Figure size 800x500 with 0 Axes>
```



[39]:
```
plt.figure(figsize=(8,5))
sector['ESG_composite'].sort_values(ascending=False).plot(kind='bar')
plt.title("Average ESG by Sector")
plt.ylabel("Composite ESG Score")
plt.tight_layout()
plt.savefig(out/'sector_esg.png', dpi=200)
```



[41]:
```
print("Analysis complete  - results saved in 'outputs/' folder.")
```

```
Analysis complete  - results saved in 'outputs/' folder.
```

[57]:
```
!pwd
```

```
/Users/shashi
```

[59]:
```
!ls outputs   # lists files inside the outputs folder
```

```
sector_esg.png      sector_summary.csv  top10_companies.csv top10_esg.png
```

[ ]:
```

```