



THE OHIO STATE UNIVERSITY

---

# Materials Sector Analysis

Justin Lane, Jackary Liang, Mitchell Likovetz

*Spring 2024*



Overview

Business Analysis

Economic Analysis

Financial Analysis

Valuation Analysis

Recommendation





## What kind of companies are in materials sector?

- provide the raw materials needed for other sectors to function.  
Such as Steel Dynamics, Inc.
- are not typically associated with materials but are in the sector  
include container and packaging companies.  
Such as Packaging Corporation of America





# Companies:

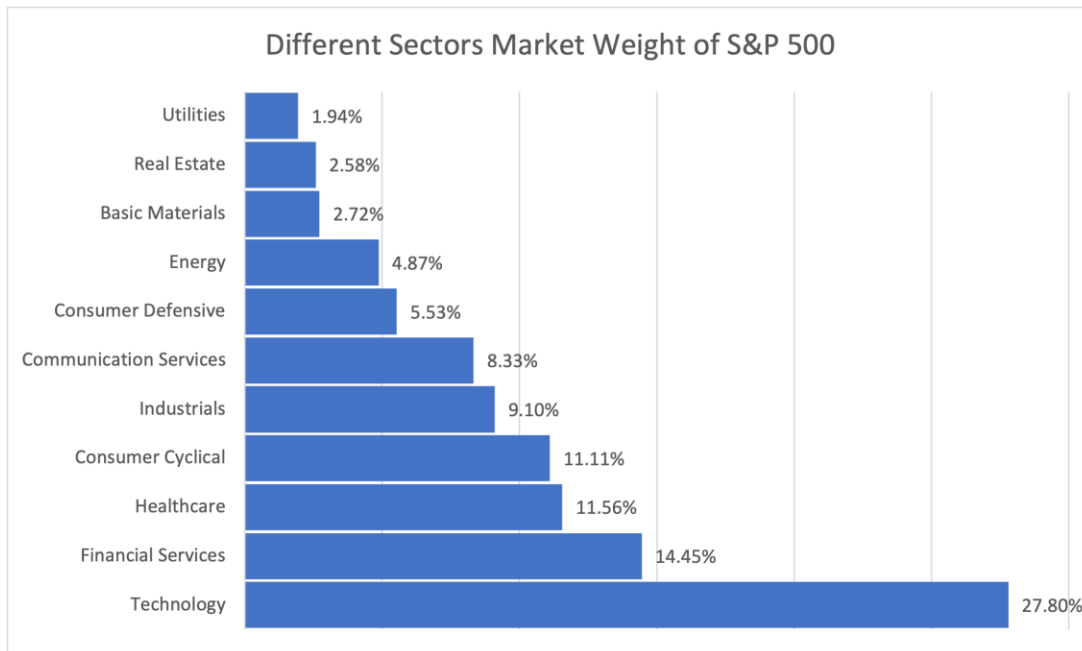
- Albemarle Corporation
- Ancor plc
- Celanese Corporation
- Corteva, Inc.
- DuPont de Nemours, Inc.
- Ecolab Inc.
- FMC Corporation
- International Flavors & Fragrances, Inc.
- Packaging Corporation of America
- Sherwin-Williams Company
- Vulcan Materials Company
- Air Products and Chemicals, Inc.
- Linde plc
- Freeport-McMoRan, Inc.
- Steel Dynamics, Inc





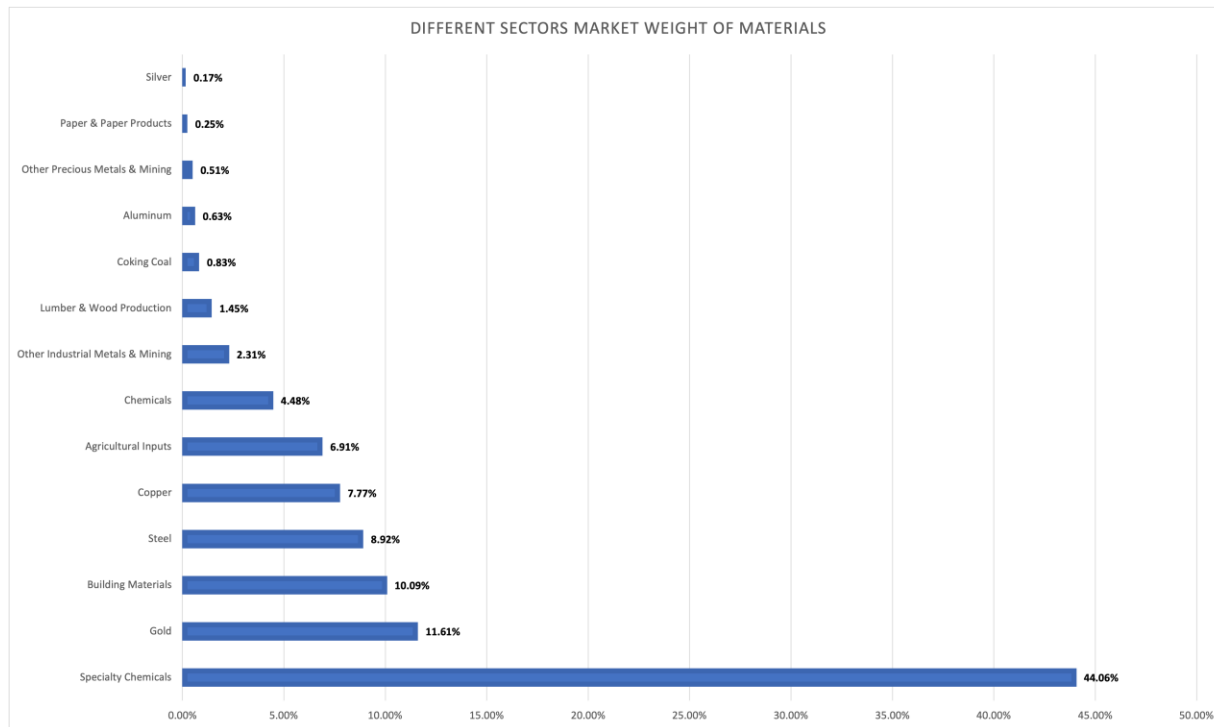
## Materials Sector Basic Information:

- Market cap is about 1.593 Trillions
- Market weight in SP500 is 2.73%
- Totally 252 Companies





# Materials Market Value by Segment:





## Materials & Economic Cycle:

- Perform well in early and late stage
- Depressed with recession

Sector	Early	Mid	Late	Recession
Financials	+			
Real Estate	++			--
Consumer Discretionary	++	-	--	
Info. Tech	+	+	--	--
Industrials	++			--
<b>Materials</b>	+	--	++	
Consumer Staples			++	++
Health Care	--		++	++
Energy	--		++	
Communication Services		+		-
Utilities	--	-	+	++

++ Consistently Overperform    -- Consistently Underperform    □ No Clear Pattern  
 + Overperform    - Underperform



## Typical reasons affect materials:



Economic Slowdown



Geopolitical Tensions



Shifting Investment Trends



Environmental Regulations

Currency Fluctuations







## Overview



In 2023, the Materials Sector Performance Reflected a Close Cyclical Relationship



With the Economy Perched on the Precipice of Recession Last Year, Material Stocks Have Not Been in Favor



Eventual Economic Brightening and Favorable Supply-Demand Dynamics in Some Areas of the Sector Could Set Up a Constructive Outlook For the Year Ahead



## Year-to-date price return

Indexed value



**Past performance is no guarantee of future results.** Materials sector performance is represented by the S&P Materials Select Sector Index. Data as of December 8, 2023. Source: S&P Dow Jones Indices, a division of S&P Global.



- Demand for Materials
- Industrial Production
- Investment and Capital Expenditure
- Inflation and Commodity Prices
- Trade and Global Demand
- Interest Rates and Financing Costs

Real GDP: Percent change from preceding quarter



U.S. Bureau of Economic Analysis

Seasonally adjusted annual rates



## Materials Index vs. GDP





## Sales & Earnings

### Sector

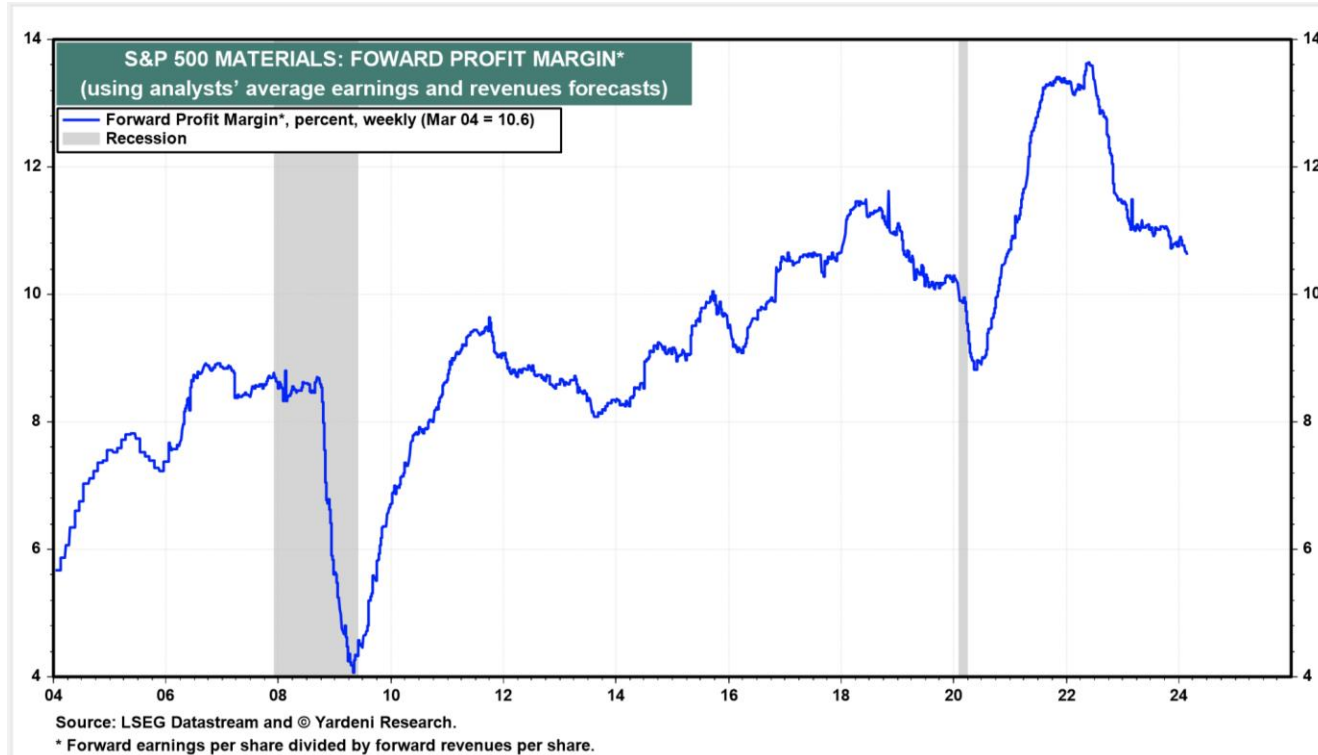
Return Analysis   TRA »							
Range	Level	% Chg	Annual	Range	Level	% Chg	Annual
1 Day	556.90	-0.53	-85.46	1 Year	531.90	+4.15	+4.11
5 Days	545.37	+1.58	+126.10	2 Year	520.74	+6.38	+3.13
MTD	550.91	+0.56	+49.83	5 Year	343.29	+61.37	+10.03
QTD	539.62	+2.66	+15.37	Qtr 3:22	427.77	+29.50	+19.81
YTD	539.62	+2.66	+15.37	Qtr 4:22	489.55	+13.16	+11.04
1 Month	510.79	+8.45	+177.71	Qtr 1:23	507.92	+9.07	+9.76
3 Month	509.54	+8.72	+39.84	Qtr 2:23	521.93	+6.14	+9.13
6 Month	516.63	+7.23	+15.02	Qtr 3:23	494.54	+12.02	+29.97

Financial Analysis   FA »			
P/E	20.92	EPS	26.47
Est P/E	21.16	Est EPS	26.18
Positive P/E before X0	22.44	Positive EPS before X0	24.69
Est Positive P/E	22.36	Est Positive EPS	24.78
Price/Book	2.98	Book/Share	186.05
Price/Sales	2.18	Sales/Share	254.55



## Sales & Earnings: *Sector Forward Profit*





## Sales & Earnings: *Broken Down By Division*

	Marketcap	Revenues (TTM)	Net Income (TTM)
Industry	(Millions)	(Millions)	(Millions)
Chemical Manufacturing Industry	\$ 1,096,059	\$ 431,884	\$ 33,447
Chemicals - Plastics & Rubber Industry	\$ 220,237	\$ 132,488	\$ 3,226
Containers & Packaging Industry	\$ 89,565	\$ 97,699	\$ 2,101
Aluminum Industry	\$ 162,748	\$ 55,010	\$ 296
Forestry & Wood Products Industry	-	\$ 59,461	\$ 2,679
Iron & Steel Industry	\$ 503,005	\$ 323,964	\$ 26,447
Metal Mining Industry	\$ 626,375	\$ 270,176	\$ 61,075
Miscellaneous Fabricated Products Industry	\$ 264,432	-	\$ 11,014
Paper & Paper Products Industry	\$ 82,339	\$ 88,232	\$ 7,984
Construction Raw Materials Industry	\$ 570,579	\$ 109,530	\$ 13,654
Basic Materials Sector	\$ 3,577,384	\$ 181,657	\$ 161,922

Industry	ONE DAY	5 DAY'S	30 DAY'S	90 DAY'S	YTD
Chemical Manufacturing Industry	↑ 0.12 %	↑ 1.36 %	↑ 0.67 %	↑ 5.21 %	↑ 0.45 %
Chemicals - Plastics & Rubber Industry	↓ -3.81 %	↓ -3.97 %	↑ 1.21 %	↓ -5.05 %	↓ -13.49 %
Containers & Packaging Industry	↑ 0.01 %	↑ 2.07 %	↑ 3.92 %	↑ 6.8 %	↑ 1.79 %
Aluminum Industry	↓ -2.03 %	↑ 2.31 %	↓ -7.84 %	↑ 8.79 %	↓ -17.67 %
Forestry & Wood Products Industry	↓ -0.83 %	↓ -0.44 %	↑ 8.54 %	↑ 23.08 %	↑ 10.17 %
Iron & Steel Industry	↑ 0.09 %	↓ -0.99 %	↑ 4.45 %	↑ 10.29 %	↑ 4.67 %
Metal Mining Industry	↓ -0.83 %	↑ 3.01 %	↓ -3.98 %	↓ -0.3 %	↓ -9.99 %
Miscellaneous Fabricated Products Industry	↓ -0.08 %	↑ 0.68 %	↑ 4.02 %	↑ 22.72 %	↑ 13.01 %
Paper & Paper Products Industry	↑ 0.23 %	↑ 1.71 %	↑ 7.45 %	↑ 8.15 %	↑ 5.24 %
Construction Raw Materials Industry	↑ 0.02 %	↑ 3.96 %	↑ 12.37 %	↑ 29.99 %	↑ 20.21 %
Basic Materials Sector	↓ -0.28 %	↑ 1.25 %	↑ 4.74 %	↑ 12.89 %	↑ 5.44 %



## Individual Stocks' Operating Margins: *2023 vs. 5-year average*

Company	2023	2018-2022
Dupont de Nemours	13.08%	11%
Linde	27.6%	21.27%
3M Co.	11.11%	9.2%





- Over the last 10 years, the value of the materials sector is strongly correlated to the value of the S&P 500.

- Median P/E, P/B and P/EBITDA relativity are all close to 0.9.

- The current valuation of the sector is close to median values, implying the materials sector is fairly valued.

- Relative to the S&P500, the current valuations of the materials sector are below median values, meaning the materials sector is undervalued relative to the S&P500, especially in P/B.

S&P 500 Valuation				
Absolute Basis	High	Low	Median	Current
P/E	32.97	14.85	20.54	23.01
P/B	4.93	2.43	3.44	4.49
P/S	3.11	1.49	2.16	2.63
P/EBITDA	18.17	8.16	11.64	13.42
Materials Valuation				
Absolute Basis	High	Low	Median	Current
P/E	32.39	11.92	19.18	18.94
P/B	4.09	1.68	3.01	2.90
P/S	2.56	1.27	1.80	2.07
P/EBITDA	15.69	6.92	10.34	10.50
Materials Relative to S&P 500				
Relative to S&P 500	High	Low	Median	Current
P/E	1.208	0.660	0.927	0.823
P/B	1.326	0.638	0.904	0.646
P/S	0.975	0.703	0.838	0.773
P/EBITDA	1.127	0.639	0.895	0.783

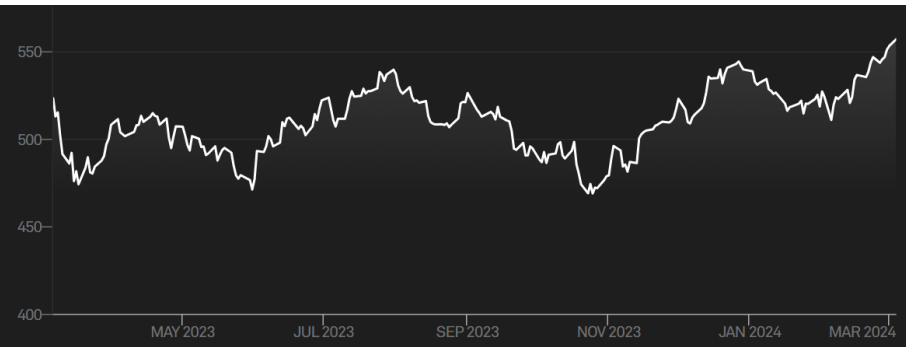


- Valuations of the materials sector rise and fall with the state of the economy.
- Over 2023, the materials sector provided a marginally positive return (3.44%) but has been sluggish due to fears of a recession.



S&P500

- If the economy expands in 2024, the sector is expected to have a boosted recovery due to increased demand.

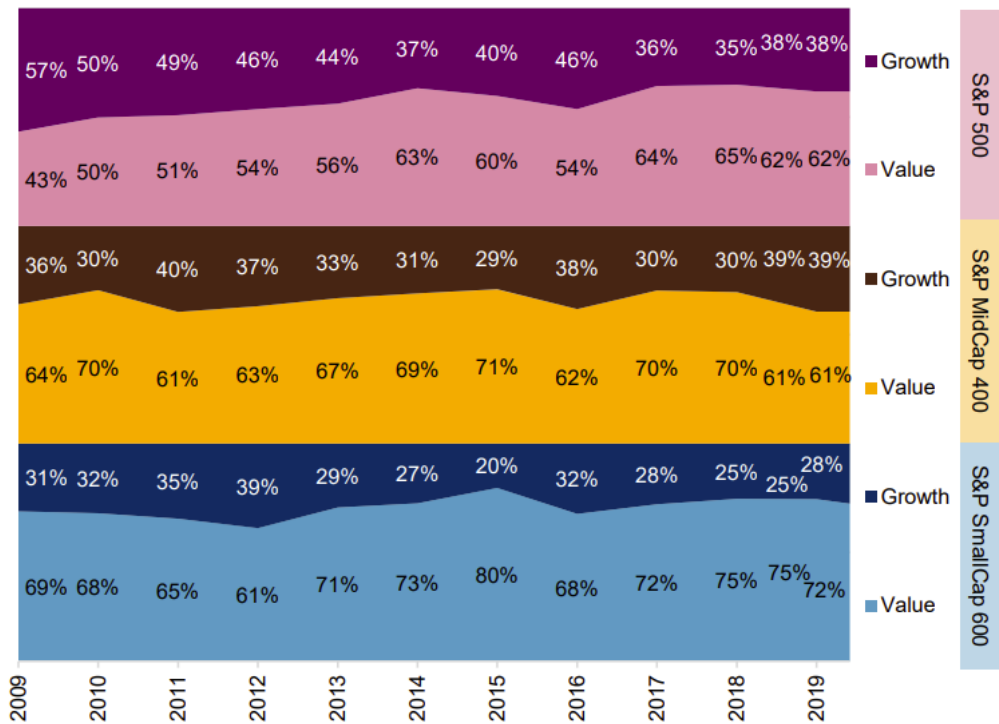


Materials Sector

- If recession concerns persist, or news of a recent recession emerges, the materials sector will continue to lag.



**Exhibit 9: Growth and Value Factor Tilts of the Large-, Mid-, and Small-Cap Materials Indices**



Source: Index Education

- Materials sector is value based even in smaller cap companies.

- Growth prospects are historically slim.

- As the sector matures, companies continue to decrease growth.

- Less opportunity for greater returns in the materials sector.



Company	Industry	Current P/S	5 year P/S	Current P/E	5 year P/E	Current P/CF	5 year P/CF	Current P/B	5 year P/B
CF Industries Holdings	Agricultural	2.33	1.98	10.15	12.04	5.65	5.47	2.63	3.18
Corteva	Agricultural	2.22	1.96	41.24	N/A	14.71	15.18	1.5	1.22
FMC Corp	Agricultural	1.65	2.51	5.2	18.32	14.68	14.75	1.66	3.98
Avery Dennison Corporation	Packaging	2.1	1.68	34.86	24.45	19.78	13.64	8.18	8.39
Ball Corp	Packaging	1.46	1.69	28.93	33.63	13.61	15.73	5.4	6.33
Crown Holdings Inc	Packaging	0.76	0.89	20.19	19.5	7.49	8.44	3.8	5.8
Celanese Corp	Chemicals	1.55	1.77	8.61	9.24	12.23	8.96	2.38	3.43
International Flavors Inc.	Chemicals	1.69	2.39	N/A	49.12	20.33	19.15	1.33	1.64
LyondellBasell Industries	Chemicals	0.81	0.74	15.69	8.44	7.09	5.39	2.55	2.81
Dow Inc.	Chemicals	0.91	0.76	69.54	10.6	9.87	5.84	2.15	2.19
DuPont de Nemours Inc.	Chemicals	2.6	1.86	63.89	N/A	13.39	12.12	1.23	1.16
Eastman Chemical Co.	Chemicals	1.14	1.17	11.78	14.77	9.73	8.39	1.9	1.92
PPG Industries Inc.	Chemicals	1.81	1.93	26.02	25.45	15.75	16.89	4.18	5.17
Sherwin-Williams Co	Chemicals	3.78	3.14	36.44	34.5	23.44	21.85	23.09	18
Freeport-McMoRan Inc.	Copper	2.39	1.73	29.63	N/A	8.89	9.24	3.26	2.68
Vulcan Materials Co	Building Materials	4.6	3.81	37.94	33.75	22.61	17.89	4.73	3.43
CRH PLC	Building Materials	1.85	1.08	21.7	16.15	13.74	8.26	2.94	1.64
Martin Marietta Materials	Building Materials	5.52	3.71	31.15	27.44	22.27	16.71	4.63	3.16
Nucor Corporation	Steel	1.35	0.84	10.4	7.8	7.49	5.3	2.19	1.81
Steel Dynamics Inc	Steel	1.16	0.76	8.9	6.59	7.26	4.97	2.38	1.9
Cleveland-Cliffs Inc	Steel	0.47	0.61	26.18	4.76	7.05	3.8	1.31	2.13
<b>Averages</b>		2.01	1.76	26.92	19.81	13.19	11.33	3.97	3.90
<b>S&amp;P 500 Index</b>		2.68		24.01		16.59		4.14	



- **Recommendation: Underweight Position**
  - Industries perform independently
- Positives
  - Materials sector is undervalued relative to S&P500.
  - Opportunities within certain industries.
- Risks
  - Cyclical and heavily dependent on state of world economy.
  - Uncertainty on economic outlook, fear of a recession caused a significant lag behind the S&P500.
- **Overweight Industries**
  - Packaging (undervalued)
  - Chemicals (fairly valued, select companies undervalued)
  - Agricultural (undervalued)
- **Underweight Industries**
  - Steel (hit or miss with performance, extremely cyclical)
  - Building Materials (overvalued)
  - Mining (must find innovators)



# Questions?