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**Sector, Industries, and Sub-Industries**

The Materials sector consists of stocks that deal with the discovery, development, and processing of raw materials. This sector of the S&P 500 Index consists of five different industries and twelve sub-industries. The industries, sub-industries, as well as some companies from these areas are located in the following table:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Sub-Industry</th>
<th>Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals</td>
<td>Diversified Chemicals</td>
<td>DOW Chemical (DOW)</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Fertilizers and Agricultural Chemicals</td>
<td>Monsanto Co. (MON)</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Industrial Gases</td>
<td>Airgas Inc. (ARG)</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Specialty Chemicals</td>
<td>Sherwin-Williams (SHW)</td>
</tr>
<tr>
<td>Construction Materials</td>
<td>Construction Materials</td>
<td>Vulcan Materials (VMC)</td>
</tr>
<tr>
<td>Containers and Packaging</td>
<td>Metal and Glass Containers</td>
<td>Ball Corp (BLL)</td>
</tr>
<tr>
<td>Containers and Packaging</td>
<td>Paper Packaging</td>
<td>Bemis Co. (BMS)</td>
</tr>
<tr>
<td>Metals and Mining</td>
<td>Aluminum</td>
<td>Alcoa Inc (AA)</td>
</tr>
<tr>
<td>Metals and Mining</td>
<td>Diversified Metals and Mining</td>
<td>Cliffs Natural Resources (CLF)</td>
</tr>
<tr>
<td>Metals and Mining</td>
<td>Gold</td>
<td>Newmont Mining Corp (NEM)</td>
</tr>
<tr>
<td>Metals and Mining</td>
<td>Steel</td>
<td>Nucor Corp (NUE)</td>
</tr>
<tr>
<td>Paper and Forest Products</td>
<td>Paper Products</td>
<td>International Paper (IP)</td>
</tr>
</tbody>
</table>

The chemicals industry encompasses several different sub-industries. DOW Chemical, the second largest chemical manufacturer in the world, is a part of the diversified chemicals sub-industry. DOW Chemical recently rejected a call to split its petrochemical operations from its specialty chemicals business, alternatively opting to pursue the option to spin off its commodity chemical operations. Monsanto Co., which specializes in insecticides and agricultural biotechnology, is a part of the fertilizers and agricultural chemicals sub-industry. The industrial gases sub-industry is home to the largest US distributor of industrial, medical, and specialty gases; namely, Airgas Inc. Airgas’s primary products are nitrous oxide (a.k.a. laughing gas, nos)
and dry ice. Sherwin Williams is well known for their paint products, which they manufacture, distribute, and sell. Sherwin Williams belongs to the specialty chemicals sub-industry.

Next is the construction materials sub-industry, followed by the sub-industry of the same name. Vulcan Materials is a part of the construction materials sub-industry and is the largest producer of construction materials in the US. Vulcan’s primarily produces gravel, crushed stone, and sand.

The containers and packaging industry encompasses the metal and glass containers sub-industry. Ball Corp. is a member of said sub-industry and is famous for being one of the first and most prolific producers of the Mason jar. Also, they are the largest producer of recyclable beverage cans in the world. Bemis Co., a member of the paper packaging sub-industry, is known for its flexible packaging products including: self venting cook-in-bag packaging, retort packaging for shelf-stable products, as well as vacuum packaging for meats and sterile medical packaging.

The first sub-industry of the metals and mining industry is the aluminum sub-industry. Alcoa Inc. is the world’s third largest producer of aluminum, which accounts for over three-fourths of their revenue. Alcoa’s has mines in both Jamaica and Australia. Cliffs Natural Resources, located within the diversified metals and mining sub-industry, mines primarily iron ore and coal used for steel production. Cliffs Natural Resources has mines in Canada and Australia as well as the US. Newmont Mining Corp., located within the gold sub-industry, is one of the world’s largest producers of gold with mines in Indonesia, New Zealand, Australia, Ghana, and Peru as well as the US. Nucor Corp, of the steel sub-industry, is the largest steel producer in the US. One of their main businesses is recycling and they recycle roughly one ton of steel every two seconds.

The last industry to cover is paper and forest products. International Paper, a paper products sub-industry company, is the largest paper producer in the world. They produce mainly plastic lids and paper cups and are significant suppliers to fast food chains.

**Sensitivity to the Market**

The materials sector is very sensitive to the world economy; this is known as a cyclical sector. Investopedia defines cyclical sector as “A type of an industry that is sensitive to the business cycle, such that revenues are generally higher in periods of economic prosperity and expansion and lower in periods of economic downturn and contraction” (Investopedia). Across this sector all of the stocks are highly sensitive to the global market. Since this is such a diverse sector the stocks react differently to different news. A stock that focuses in construction will react different than a gold industry. With stocks like construction and metals it is no surprise that these companies perform dramatically better in times of economic expansion.

Another area an investor must dig deeper into is what phase of the business cycle in which these stocks perform the best. Historically sectors have different times in the business cycle in which they perform better. According to fidelity the materials industry are good buys during early and late periods of the economic uptrend. Materials also received a sell or a do not buy during the middle of economic growth (Fidelity). When overlooking this data it was a shock to me that the materials sector does not perform well in the middle phases of economic growth. This is because this phase in the business cycle favors sectors like technology and energy.

**Sector Traits of Note**

Of all the sub-industries located within the materials sector a couple really stood out in terms of expenditures as a percent of revenues. The two areas that stood out were iron and steel...
manufacturing (steel sub-industry) and inorganic chemical manufacturing (includes virtually every sub-industry under the chemicals industry). Both of these areas were shown to have very high purchases as a percentage of revenue, as shown below.

Here it is shown that purchases accounts for 64.7% of iron and steel manufacturer’s revenues. The majority of these purchases are made up of raw materials, fuel, as well as contractor expenses.

Similar to iron and steel manufacturing, inorganic chemical manufacturing also maintains a high purchasing level compared to revenues; 45.3% as shown. The majority of these purchases are made up of packaging, fuels, minerals, and other natural resources used to make the compounds. In addition to high purchases, this area also boasts high levels of other spending at 25.3%. The majority of said spending is made up of research and development spending, which makes sense due to significant pushes to create more environmentally friendly compounds.

The high level of purchases these two areas share are indicative that both areas are very high leveraged. In other words, both areas maintain very high fixed costs, therefore have high operating leverages. This shows how both areas are extremely sensitive to the economy (i.e. cyclical). If the economy took a significant downturn companies in these areas may incur less variable costs since they would be producing less, but they would incur the same level of fixed costs if the economy was doing exceptionally well.
Drivers of the Sector

When looking at stocks it is always important to glance at the some drivers of the sector. The list of possible economic drivers in the market is long. Though when looking at these drivers it seems there are some obvious drivers that would affect materials sector more than others. The three that were touched on during our presentation were housing permits requested, employment, and automobile manufacturing. Housing permits requested can show an investor just how many people are thinking about building this would directly affect some of the materials stocks like Vulcan Materials (VMC). If the number of permits requested is increasing it could forecast higher earnings for VMC and other similar stocks in the future. The same holds true with automobile manufacturing only instead of affecting construction this would affect US Steel (X) and other steel manufacturers. The employment report would be a number that could affect the whole materials sector the same. This could show an investor how well the companies are doing internally. If companies are declining the number of workers who work for them, it could show they are expecting or experiencing hard times. With a detailed study of these reports one might be able to respond to the fluctuating market before the industries have a chance to react.

Macroeconomic Environment for 2014

The macroeconomic environment for 2014 will continue much like it did over the past year with some slight variances. GDP is expected to grow approximately 2.7% or better. The gain is expected as consumer confidence increases, which has been well below normal levels compared to other periods of economic expansion. The low job growth over the past couple months due to uncertainty caused by Obamacare is expected to be offset by the addition of 2.3 million new jobs in 2014. As job growth increases more people will come back into the labor force and we should see unemployment stabilize at about 6.5% for 2014. The Fed’s announced tapering of its long term bond buying in 2014 is likely to keep short term interest rates low, but push long term rates up. How much long term rates will increase depends on how much slack investors will take up. The more slack they take up, the less significant the long term rate increases will be. Inflation is expected to remain under 2% for 2014. Inflation was 1.5% from December 2012 to December 2013 and is expected to post at about 1.8% from December 2013 to December 2014. This upward trend mirrors the Federal Reserve’s goal to achieve inflation of 2% to 2.5%; rates at which policymakers say are necessary for sustained hiring and investment.

Overall, the materials sector looks promising for 2014. The highest growth areas appear to specialty chemicals in addition to steel. As more manufacturers move away from commodity chemicals, such as DOW Chemical’s splitting of said business, more focus is shifted to the higher quality specialty chemicals. This will help stabilize chemical manufacturer’s incomes due to the less cyclical nature of specialty chemicals. The main problem the steel industry has faced over the past few years has been excess production and supply. Consumers can’t and won’t keep up with the rate steel is being produced. As steel manufacturers gradually begin to taper steel production to consumer demand levels (a point that likely will not be reached until early 2015 at the earliest) and capacity utilization improves the steel industry will continue to emerge from its cyclical trough at an even faster rate than it currently is.

Life Cycle

When looking at a sectors life cycle it is much easier to look at it at an industry level instead of the sector as a whole. The first sector that will be examined is the steel manufacturing life cycle. This sector is in a mature stage which means the growth of this sector is small or
declining and there are many mergers and companies are becoming larger. The iron and steel
manufacturing, industry value added is supposed to decline by 3.4% in ten years (IBISworld).
Some of the reasons for this decline are the high fixed cost experienced in these industries along
with declining prices. Mix these factors with the increase of global competition and one can see
why some of the steel manufacturing businesses are struggling. These sectors are also highly
regulated by the EPA in terms of how much pollution they create when manufacturing steel and
iron. This could create a huge problem for these companies if they are not able to pass an
environmental investigation. Another aspect that shows this sector is in a mature cycle is there
are no new technology breakthroughs on the horizon.

Another industry that was looked at was the chemical product manufacturing; this
industry includes stocks like DOW Chemical (DOW). This sector is also in a mature stage with
a very little growth expected in the next few years. Like steel manufacturing the chemical
industry does have to worry about the issue of environmental concerns. We have seen in the past
the ramification environmental concerns have had in the chemical sector. There was a chemical
called DDT this chemical was found to have negative effects on the environment and was
therefore banned from future use. If a situation similar happened to another chemical company,
it would surely have a negative impact on the stock price.

As a whole this sector seems to be mainly in the mature life cycle. The companies seem
to be very competitive with one another and consolidation seems to be a common theme. This
sectors seems to have plenty of emerging trends to deal with across the board. These emerging
issues differ\ when comparing industries side by side.

### Valuation Matrices Comparison

<table>
<thead>
<tr>
<th></th>
<th>US Steel Corp</th>
<th>Nucor Corp</th>
<th>DOW Chemical</th>
<th>FMC Corp</th>
<th>Metals and Mining Industry</th>
<th>Chemicals Industry</th>
<th>Materials Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P/E (ttm)</strong></td>
<td>-33.58</td>
<td>31.81</td>
<td>12.83</td>
<td>22.48</td>
<td>11.66</td>
<td>26.07</td>
<td>16.42</td>
</tr>
<tr>
<td><strong>P/S (ttm)</strong></td>
<td>0.21</td>
<td>0.81</td>
<td>0.97</td>
<td>2.55</td>
<td>0.88</td>
<td>0.76</td>
<td>3.21</td>
</tr>
<tr>
<td><strong>P/B (mrq)</strong></td>
<td>1.24</td>
<td>2.02</td>
<td>2.42</td>
<td>7.2</td>
<td>0.7</td>
<td>0.92</td>
<td>2.72</td>
</tr>
<tr>
<td><strong>P/Tan B (mrq)</strong></td>
<td>1.37</td>
<td>3.21</td>
<td>5.65</td>
<td>14.53</td>
<td>0.77</td>
<td>1.32</td>
<td>3.78</td>
</tr>
<tr>
<td><strong>P/CF (ttm)</strong></td>
<td>-</td>
<td>12.89</td>
<td>7.77</td>
<td>16.49</td>
<td>16.64</td>
<td>5.77</td>
<td>11.7</td>
</tr>
<tr>
<td><strong>P/FCF (ttm)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>187.63</td>
<td>13.82</td>
<td>3.88</td>
<td>24.47</td>
</tr>
</tbody>
</table>
The chart above shows specific valuation ratios for four separate companies and their respective industries. Note that negative price-earnings ratios are largely not accepted by the financial community as shown for US Steel Corp. Price-earnings ratios larger/smaller than their respective industry are thought to have higher/lower earnings growth potential than the industry. A price-sales ratio larger/smaller than their respective industry may indicate overvaluation/undervaluation of the stock. Similarly, a price-book ratio larger/smaller than their respective industry may indicate the stock is overvalued/undervalued. Theoretically, a higher price-tangible book ratio may mean higher losses to investors if the company decides to liquidate. The price-cash flow ratio is a good measure of future financial health when compared to their respective industry. The higher the price-free cash flow ratio, the more expensive the company is considered to be.

**Price Charts**

Another important area for investors to look at is recent price charts and to use those charts to learn how the industry has reacted in the past. The charts below compare the materials industry (XLB) with the S&P 500. The price charts can reveal very important information when examined.

The chart above is a three months comparison between XLB and the S&P 500. The area of this chart I would like to bring attention to is an area in late January when an individual can see the XLB market started to recover well before the S&P 500. The major reason for this is the investment group of Third Point took a large share in DOW Chemical (DOW). The materials industry was recovering so well that it played a major role in the bounce back of the whole S&P 500.
This is a one year chart again comparing XLB to S&P 500. What is extremely noticeable is how the S&P 500 dramatically outperformed the XLB in the months of April and May. I believe the main reason for this was because of the fear of federal tapering. This is obviously affected both sectors though it seems to have affected the materials market much more than the S&P 500. When looking at this chart one can see how much the materials market is affected by the stock market. These two lines are about identically for much of this chart.

**Recent News**

The most significant recent event within the materials sector is DOW Chemical’s decision to split off its commodity chemicals business from its specialty chemicals business. Commodity chemicals have been on the decline and many companies in the chemicals industry are starting to move towards specialty chemicals instead.

Some other events of note, but not sector-altering, include Vulcan Materials’ stock price rising 9.7% on 2/6/14 in response to its net income tripling in Q4 of 2013. Also, on 1/31/14 Newmont Mining Corp’s stock price dipped 10.4% due to low production forecasts. On 1/29/14 DOW Chemical raised its dividends to .37¢, from .32¢, and also tripled its share buybacks to $4.5 billion, from $1.5 billion. Lastly, on 1/27/14, the Supreme Court ruled in favor of US Steel Corp saying that steelworkers do not need to be paid for time spent putting on protective gear.
References


