



Albermarle Corp.

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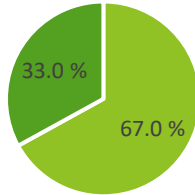
NYSE Symbol: ALB

Recommendation: BUY

Covering Analyst: Parker Meredith

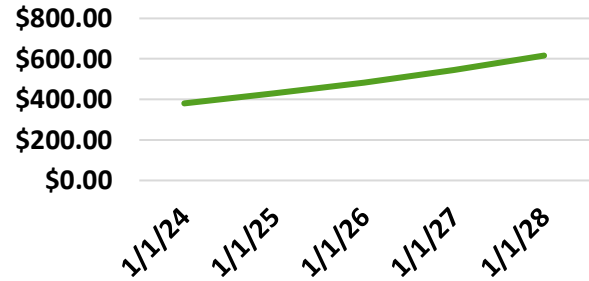
Intrinsic Value: \$345.58

Weighting



■ EV/EBITDA ■ Relative

Price Target



Capital Structure

Equity	91.30%
Debt	8.70%

CAPM Presumptions

Beta	1.54
Risk Premium	5.9%
Risk-Free Rate	3.7%
Terminal Growth Rate	3.00%

WACC Presumptions

Cost of Equity	12.8%
Cost of Debt	5.3%
Cost of Capital	12.1%

Intrinsic Value Margin of safety

\$345.58 19.2%

Source: Company Data, Group Estimates



ALB 5-year comparison to S&P 500

Executive Summary

This equity report provides an analysis and evaluation of the current and future performance of **Albermarle Corporation** over a future period of five years. My methods of analysis include the **discounted cash flows model (DCF)** and **relative model**, as well as various ratios including but not limited to ROA, ROE, ROIC, liquidity ratios, capital structure ratios, and profitability ratios.

Results of data analyzed show that the company is fundamentally sound. The company more than doubled revenue in 2022, maintains a robust cash position, and is continuing expansion to capitalize on the boom in lithium.

Our report finds that the prospects of the company in its current position are **very positive**. The primary catalysts for long-term growth include:

- An increasing global demand for electric vehicles
- Increasing production volume capabilities in lithium conversion plants
- Restructured contracts allowing the company to capitalize on higher lithium prices

I conclude that this company's stock is attractively **undervalued**, resulting in a margin of safety of **19.2%**. Reasons that the market has placed this stock at value include:

- The market fails fully understand the future demand for electric vehicles
- The market fails realize the total demand for lithium beyond just EVs in the future
- The market fails to project lithium supply lagging demand resulting in higher lithium prices

Key Stock Statistics:

52-Wk Range (\$)	169.93-334.55	Dividend Yield	0.55%	Book Value/Share (mrq)	57.47
Beta	1.52	Diluted EPS (ttm)	13.19	Operating Margin (ttm)	32.89%
Market Capitalization (\$BN)	31.86	P/E (ttm)	21.86	S&P Credit Rating	BBB
Forward Annual Dividend	1.58	P/B (mrq)	4.73	Institutional Ownership	85.34%

Source: Yahoo! Finance

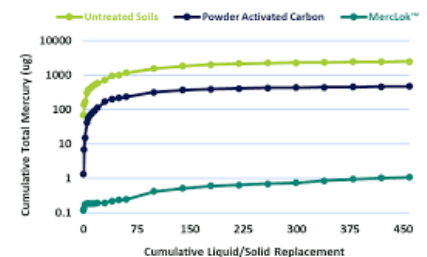
Recent News & Management Guidance

On January 30th Albemarle announced the launch of Ketjen. This is what was formerly the catalysts business but has since become Albemarle's wholly-owned subsidiary that crafts tailored, advanced catalyst solutions for the petrochemical, refining and specialty chemicals industries. The business will be headquartered in Houston and continue to offer the same products and services it did before the split. "The launch of Ketjen continues our legacy as a partner-of-choice for industry leaders," said Albemarle CEO Kent Masters. "Establishing Ketjen under this separate structure will allow the business even greater focus and continued development of custom, high-impact catalyst products."



On January 23rd, Albemarle hosted a 2023 strategic update as well as releasing their new 5-year outlook. This update came after the 2022 boom in the business where annual expectations for 2022 were raised at every single earnings call and update. Looking to 2023, Albemarle is forecasting net sales of \$11.3 billion to \$12.9 billion and adjusted diluted EPS to fall between \$26.00 and \$33.00. Furthermore, CAPEX is expected to be between \$1.7 billion and \$1.9 billion. Looking to the 5-year plan, Albemarle is expecting a net sale 5-year CAGR of 19% to 21%. This number is heavily dependent on expected energy storage revenue which is expected to have a 5-year CAGR of 25% to 27% over the time period. Albemarle also expected 2027 free cash flow to be between \$2.6 billion and \$2.7 billion.

In December, Albemarle announced the release of their new product in the bromine business MercLok™. MercLok™ is a soil treatment for mercury remediation. Known in the industry as an amendment, MercLok cost-effectively captures mercury in soil, mining waste and, through in-ground treatment, groundwater over the long term, capturing the potent and highly mobile neurotoxin. MercLok is positioned to be a leader in the marketplace with rapid capture at low dosage rates and long-term stabilization of mercury.



Business Description

Albemarle Corporation was founded in February 1994 after the completion of the corporate spin-off from Ethyl Corporation's chemical businesses. Since its independence, Albemarle has become one of the world's leaders in the development, manufacturing, and engineering of highly specialized chemicals, mainly focusing on lithium, bromine and refining catalysts. These chemicals are used in a wide variety of markets including but not limited to construction, automotive, crop protection, energy storage, and petroleum refining.

Albemarle is headquartered in Charlotte, North Carolina, but has ventures, and plants throughout the world. The company operates internationally through R&D facilities, production facilities, and sales and administrative offices in North and South America, Europe, the Middle East, and Asia. Albemarle is looking to continue to expand, capitalizing on the recent boom in demand for their products.

Revenue Drivers

Albemarle breaks down revenue into three main segments: Lithium, bromine, and catalysts.

Lithium – 41 % of FY21 Revenue

Lithium is the overwhelming majority of Albemarle's business, largely due to the increasing demand of lithium for batteries, especially those within electric vehicles. In FY21, lithium made up a total of 41% of total revenue, however this segment of the business has grown much larger in FY22 and is looking to make up nearly 70% of FY22 revenue. Due in large part to the demand for lithium in EV batteries, Albemarle saw lithium net sales in Q3 2022 increase 318% year over year. Management expects that through FY22, approximately 85% of the Lithium contracts are made up by battery-grade revenues. Furthermore,



management expects that 5-10% of FY22 lithium revenue comes from technical grade (high enough quality to use industrially) revenues and another 5-10% from specialty grade (graded to ensure safety, consistency, and compliance) revenues. Lithium volume is expected to increase around 20% in FY22 leading to an expected adjusted EBITDA growth of 500-550% year over year.

Bromine – 33.9% of FY21 Revenue

The Bromine segment is the second largest for Albemarle. For the FY21, Bromine made 33.9% of total revenue for Albemarle, up from 30.8% in the year prior. In Q3 22, Albemarle saw Bromine net sales of \$354.9 million increase 28% from the same period a year prior. For Q3, the Bromine segment saw prices rise 18% and volume of production rise 10%. This contributed to an adjusted EBITDA growth of 24% year over year. Most bromine products manufactured by Albemarle are used in fire safety solutions and other specialty chemicals applications such as oilfield drilling, pharmaceutical manufacturing, high-tech cleaning, water treatment, food safety and more. Roughly 60% of sales in the Bromine segment come from fire safety solutions. This percentage is largely driven by the use of Albemarle bromine products used in industrial and consumer electronics which will be covered in greater depth in the products section of this report. The remaining portion of sales comes from GDP-plus business such as industrial and consumer electronics, automotive, construction, and appliances.

Catalysts – 22.9% of FY21 Revenue

The smallest revenue segment for Albemarle is the Catalysts segment. Responsible for 22.9% of FY21 revenue, the segment shrunk from the year prior where it made up 25.5% of total revenue. Relative to the other segments, the catalysts segment has been performing much worse this year, largely due to natural gas pricing pressure related to the war in Ukraine and rising raw material costs. Because of this, adjusted EBITDA is expected to decline 45-65% year over year. The Catalyst segment contains three different product lines. Fluidized Catalytic Cracking (FCC) makes up about 50% of total catalysts sales, Hydroprocessing catalysts (HPC) accounts for roughly 30%, and Performance Catalysts Solutions (PCS) about 20%. In Q3, Albemarle completed a strategic review of the Catalysts business. This review considered a wide range of value creation opportunities including a joint venture with a partner, a spin-off or sale, or Albemarle retaining the business. Albemarle concluded that the Catalysts business will be held as a separate wholly owned entity with a separate brand identity. Going forward it will be known under the name Ketjen. For the purpose of this report, I will continue to treat it as a segment of Albemarle. Through the catalyst segment of the business, Albemarle provides flexible, performance-based catalysts, technologies, and related services to the refining and petrochemical industries.

Others – 2.2% of FY21 Revenue

This segment is unique to the FY21 revenue breakdown as it only includes the Fine Chemistry Services (FCS) business. This business was sold on June 1, 2021 and does not fit into any of the core businesses. Going forward, this will not be a revenue segment.

Products or Services

As covered above, Albemarle products are focused into three distinct areas: lithium, bromine, catalysts. Each of these segments contains distinct products and services that will be covered below.



Lithium

Albemarle's Lithium business spans a wide range of industries, much further than just products tailored for energy storage that lithium is known for. The broad range of basic lithium compounds including lithium carbonate, lithium hydroxide, lithium chloride, and value-added lithium specialties and reagents are commonly used in high performance greases, thermoplastic elastomers for car tires, rubber soles, plastic bottles, various life science applications, and intermediates in the pharmaceutical industry. As well as developing and supplying lithium compounds, Albemarle also provides services including the handling and use of reactive lithium products as well as offering lithium recycling services.



Albemarle lithium mining plant in Chile



An EV battery. Each EV battery contains roughly 12 KG of lithium

The largest section of the Lithium products for Albemarle are battery products. Albemarle offers a wide range of different battery products such as lithium metal, lithium salts, lithium sulfide and LiBOB. The lithium metal products offered by Albemarle are ingots, foil, rods, and anodes and come in hundreds of sizes and thicknesses for primary and secondary lithium batteries. The company also is prepared to develop "new and unique products to suit novel and innovative applications withing the rapidly evolving sector of battery industries". The lithium salts developed by Albemarle such as lithium carbonate and lithium hydroxide are the basis for rechargeable batteries used not only in EV's but also in a vast

number of electronic consumer goods. Lithium carbonate is the building block for other lithium derivatives and used the most widely. Albemarle produces Lithium Carbonate on naturally occurring lithium brines and the product can be used in a great variety of applications in the ceramic and enamel industry, heat resistant glass, pharmaceuticals, and lithium-ion batteries. Lithium sulfide, one of the key materials for an increased safety level of batteries at a concurrent opportunity for cost benefits, is a promising new product offered by Albemarle. The product characteristics of an ultra-low impurity profile, free flowing, easy to dose, and high lot-to-lot consistency makes this unique product especially suitable for a variety of processes and applications in the energy storage sector.

Other lithium products not pertaining to batteries for Albemarle include:

Butyllithium, an important initiator for the manufacture of chemicals central to the rubber and plastics market.

Energetic materials including barium which is used by the oil and gas industries to make drilling mud and strontium which is used for producing phosphorus materials for the lighting industry (LEDs).

Binary hydrides such as Hafnium Hydride used as a constituent part in compositions for flares, fuzes, and combustion charges in pyrotechnics.

Organometallics like alkoxides, used as bases in organic synthesis of pharmaceuticals and fine chemicals, amides, used in modern selective organic synthesis, and organomagnesium compounds which are broadly employed in pharmaceutical, flavor and fragrances, polymer, and agrochemical applications.

Potash/Potassium chloride for fertilizers and industrial growth. Potassium chloride is a nutrient essential for plant growth, increasing production, and improving quality of crops and therefore is used widely in the agricultural business.

Spodumene, a mineral that is chemically a lithium aluminum silicate, is used widely in the glass and ceramics industry and for metallurgical applications.

Bromine

The largest and most prominent aspect of the Bromine business is centered around fire prevention additives. For Albemarle, the SAYTEX® line of products leads the way. Most important products to us are made of combustible materials such as electronics, appliances, vehicles, wiring, textiles, building materials, and many more. Fire prevention additives like the SAYTEX® bromine fire retardants have been tested and demonstrated significant ability to mitigate the risks of fire damage.



An Albemarle bromine manufacturing plant

Another major product line stemming from the Bromine business is the MercLok™ Mercury Remediation. This product is designed for the rapid stabilization of mercury found in a range of soils and industrial wastes. These products are commonly used at industry sites including mining, chlor-alkali, chemical manufacturing, and munitions sites. The product is also capable of capturing and stabilizing multiple species of mercury including elemental mercury, ionic mercury, and methylmercury. Furthermore, the product can be applied using numerous techniques such as in-situ applications, ex-situ blending techniques, and direct push injection.

Also a part of the Bromine business are bromine derivative products. These products are used in chemical synthesis, oil and gas and well drilling and completion fluids, mercury control, paper manufacturing, water purification, beef and poultry processing, and various other industrial applications. Other chemicals produced from bromine are tertiary amines for surfactants, biocides, disinfectants and sanitizers, as well as potassium-based products used in industrial applications.

Catalysts

There are three main product lines within the catalysts segment: Clean Fuels Technologies (CFT), which is primarily composed of hydroprocessing catalysts (HPC) together with isomerization and alkylation catalysts; fluidized catalytic cracking (FCC); and performance catalyst solutions (PCS), which is primarily composed of organometallics and curatives.

There is a wide range of HPC products, which are applied throughout the oil refining industry. Their application enables the upgrading of oil fractions to clean fuels and other usable oil feedstocks and products by removing sulfur, nitrogen and other impurities from the feedstock. In addition, they improve product properties by adding hydrogen and in some cases improve the performance of downstream catalysts and processes. Albemarle continuously seeks to add more value to refinery operations by “offering HPC products that meet customers’ requirements for profitability and performance in the very demanding refining market”.



Albemarle also provides customers with customized FCC catalyst systems, which assist in the high yield cracking of refinery petroleum streams into derivative, higher-value products such as transportation fuels and petrochemical feedstocks like propylene. The FCC additives are used to reduce emissions of sulfur dioxide and nitrogen oxide in FCC units and to increase liquefied petroleum gas olefins yield, such as propylene, and to boost octane in gasoline. Albemarle offers unique refinery catalysts to crack and treat the lightest to the heaviest feedstocks while meeting refinery yield and product needs.

Within the PCS product line, Albemarle manufactures organometallic co-catalysts (e.g., aluminum, magnesium and zinc alkyls) used in the manufacture of alpha-olefins (e.g., hexene, octene, decene), polyolefins (e.g., polyethylene and polypropylene) and electronics. Their curatives include a range of curing agents used in polyurethanes, epoxies and other engineered resins.

Prices and Fee Structure

All of Albemarle sales come through the form of contracts. Albemarle is committed to long term contracts with strategic customers. Most of the companies' volumes are sold under two-to-five-year contracts and most Albemarle contracts are structured around the market index, allowing the company to capture the benefits of higher market pricing while also dampening volatility. This means that neither Albemarle nor their customers are too far out of the market. There currently are fixed price contracts being held by Albemarle, but they are in the process of being converted to the index reference variable contracts.

Albemarle has been working to change pricing structure in lithium contracts to enable capturing the most profit from higher lithium prices. Lithium prices have been sharply increasing, so utilizing market index contracts has allowed and will continue to allow Albemarle to capture the greatest profit.

Albemarle's contracting approach has been evolving recently and is going to continue to evolve specifically regarding the quickly growing Lithium business. For the battery grade revenues in the lithium business, 15% are spot contracts (at the time of purchase order), about 65% are the index-referenced, variable-priced (typically a 3-month lag, some have floors and ceilings, but specifics vary by contract), and about 20% are fixed contracts with price openers (typically a 6-to-12-month lag). Technical grade revenues follow this same pattern closely. The Specialty grade revenues typically utilize annual contracts.

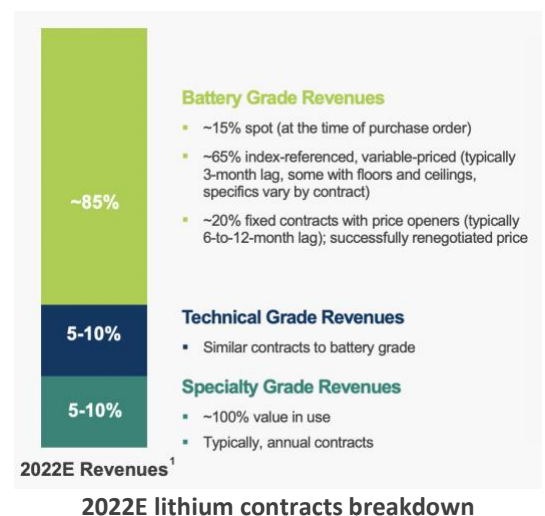
As touched upon, some contracts that Albemarle holds have long-term fixed-price settings. The majority of these contracts are in the Bromine and Catalysts business as each of those sectors has been far less exposed to wild shifts in pricing.

Business Strategy

As the price and demand for lithium increases, Albemarle is taking strategic steps to ensure they are able to capture large profits and capitalize on their existing position within the sector. They plan to achieve this through a few strategic routes.

The first was touched on above. The renegotiation and formation of lithium contracts are one of the major steps Albemarle is taking. These changes will allow the company to get more value from their sales and generate more revenue in the lithium business.

Albemarle is also heavily focused on keeping a solid balance sheet and strong net cash positions in order to execute their growth strategy when opportunities present themselves. Albemarle's balance sheet includes \$1.4 billion of cash and available liquidity of over \$3 billion. Since last quarter, net debt-to-adjusted EBITDA improved to approximately 0.9 times and is expected to end the year between 0.6 and 0.7 times giving the company excellent flexibility. During October, Albemarle upsized and extended their revolving credit facility to reflect their larger scale and position them well in case of market turbulence. Furthermore, over 90% of Albemarle's debt position is at a fixed rate, which safeguards them against the impacts of a rising interest rate environment. Going forward Albemarle is looking to enable continuation of growth through maintaining this financial flexibility. They are also planning on slowing hiring, T&E, and other discretionary costs to increase this flexibility.



Using this strong balance sheet, Albemarle is hoping to grow the company through strategic acquisitions and increased volume. Albemarle is looking to specifically grow the lithium and bromine segments of the business to leverage low-cost resources. In doing so, they are focusing on maintaining capital discipline and operational excellence. One recent example of this was the Qinzhou acquisition that was closed in October of 2022. This acquisition allowed Albemarle to accelerate growth, increase volume, and meet return hurdles. CEO Kent Masters has said that investing in high-return growth opportunities such as Qinzhou remains Albemarle’s top capital allocation priority to support the growth strategy.

Another recent strategic change Albemarle made is an update to the catalysts business and a reshaping of the core portfolio. In terms of the catalyst business, Albemarle has decided to retain the entire business as a wholly owned subsidiary. This new subsidiary will focus on tailoring catalysts solutions to complex challenges to enhance performance. Separation work is currently underway and is expected to be complete by early 2024. Before the separation is finalized, Albemarle is investing to maximize value and growth opportunities for the new subsidiary.

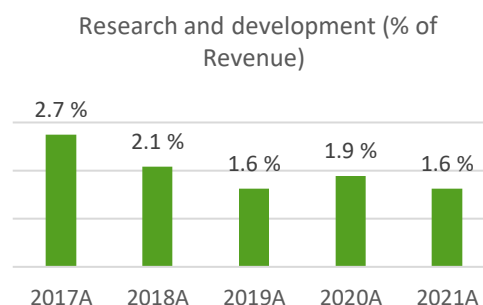
Alongside the separation of the catalyst business, Albemarle has also decided to reshape their core portfolio with a stronger focus on multiple growth opportunities. The company will be split into two segments: Energy Storage and Specialties, and this structure is effective starting January 1, 2023. These two global business units (GBU) will be split as follows:

- **Albemarle Specialties:** This GBU will include the current Bromine business as well as the Lithium Specialties business in the current Lithium business. This new GBU will focus on the company's suite of bromine and highly specialized lithium solutions which benefit from complementary competencies in organic chemistry, application knowledge, and process technology. Netha Johnson, current president of Bromine, will become president of Albemarle Specialties.
- **Albemarle Energy Storage:** This GBU will include the Hydroxide, Carbonate, Battery Grade Metal, and Advanced Energy Storage businesses in the current Lithium business. This new GBU will focus on the markets, customers, resources, production, and advanced metals research needed to advance lithium-ion battery evolution and the global energy transition. Eric Norris, current president of the Lithium, will become president of Albemarle Energy Storage.

Cost Drivers

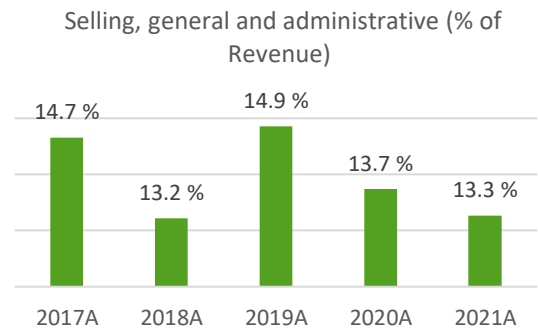
Research, Development, and Engineering Expenses (RD&E)

R&D has historically been a very small percentage of Albemarle revenue. In the past 5 years, on average it has only been 1.7% of total annual revenue. This percentage has also been shrinking. In 2017 R&D was 2.7% of total revenue, and in 2021 it was just 1.6% of total revenue. Albemarle alongside their joint partners operate over 25 R&D locations around the world. Despite this, Albemarle has been focusing less on R&D and more on increasing volume and production capabilities of their locations around the world.



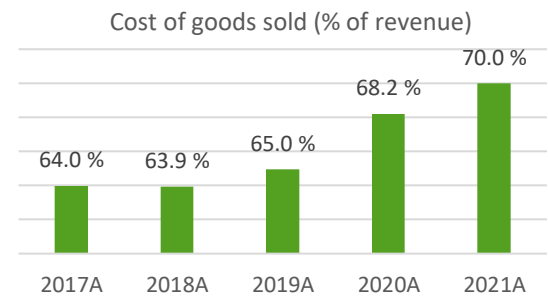
Selling, General and Administrative Expenses (SG&A)

SG&A costs have made up significantly larger portions of revenue than RD&E. On average over the past 5 years they have accounted for 14% of total revenue. This number has stayed quite constant over that time span. Despite showing relatively consistent numbers in terms of this expense, last year there were some key differences in the costs in this category. There was higher compensation, including incentive-based, expenses across all businesses and corporate. This was largely offset by a \$20.8 million decrease in restructuring and other expenses, and acquisition and integration related costs for various significant projects. These costs will likely stay relatively constant in the years to come.



Cost of Goods Sold (COGS)

COGS is by far the largest expense for Albemarle. On average COGS expenses have been 67% of total revenue. This number has been increasing consistently over the past 5 years. In 2017 they were 64% of total revenue, and in 2021 COGS expenses were 70% of total revenues. This number is expected to continue to rise slightly as access to raw materials increases, however Albemarle has access to many low-cost options that keep these numbers relatively lower than competitors.



Industry Overview

Because Albemarle is essentially three different business each focused on different niche industries, I am going to cover the industry growth and disruptors in each of the three sectors of Albemarle's business. As each of the three sectors are seeing vastly different growth patterns, I feel this is the best way to cover each industry. Doing this will allow for a greater picture of the business as well as how each individual sector is expected to grow or contract in the coming years.

As I have mentioned numerous times up until this point in the report, the lithium industry is growing incredibly quickly, largely spurred by a surge in EV demand. In November 2022, lithium prices hit all time highs, eclipsing previous highs in both October and September of the same year. Due to accommodative governmental policies, declining costs, consumer preference, and technological improvement responsible for the increasing adoption of electric vehicles, lithium supply upgrades have not kept pace with the surge in demand.

The bromine industry is also seeing growth, though not at the same magnitude as lithium. In the last half of 2022 some softness in the market emerged, largely as an impact of economic conditions. As covered above, the main use of bromine is for fire retardants. These are largely used in construction and other manufacturing. With rising interest rates and a decline in new developments, some softness has emerged in the market. This is not expected to last too long as these fire retardants are used in much more than just construction and manufacturing.

The catalyst industry is growing much slower than bromine and lithium. This is largely due to the nature of the industry. Many of the products in the industry are dependent on the expansion and building of new oil rigs and drills. This market is simply not growing as fast as the others I have mentioned, but that does not necessarily mean it has a bleak outlook.



Industry Growth

Lithium

According to Fortune Business Insights, in 2020, the US lithium market size was \$3.64 billion. By 2028 this number is expected to grow to \$6.62 billion at a CAGR of 8.1%. In 2021 the global lithium market was valued at \$6.83 billion and is expected to grow at a CAGR of 12% from 2022 to 2030. I have calculated lithium to grow at the fastest rate of all business segments. By 2026 I have forecasted lithium revenue to be \$12.8 billion, up from the \$5 billion in 2022. This growth is due to a few factors:

Increasing Adoption of Electric Vehicles

Thanks to strict government regulations on vehicle emissions and technological advances, the electric vehicle market has seen incredible growth in recent years. According to Forbes, in Q2 of 2022, electric vehicle sales accounted for 5.6% of the total auto market (up from 2.7% in the same period a year prior). Batteries, especially those with lithium, are crucial for hybrid electric vehicles, all electric vehicles, and plug-in hybrid electric vehicles. Forbes also has noted that between 2020 and 2021 global EV sales doubled and are expected to increase by another 52% in 2022. In order to support this growth, large amounts of lithium are necessary for the production of EV batteries. On average, the lithium-ion battery packs found in electric vehicles contain about 12kg of lithium.

Annual lithium demand is projected to reach roughly 1.5 million metric tons of lithium carbonate equivalent by 2025 and over 3 million tons by 2030. The 2025 forecast is triple the demand seen in 2021. In 2021 EVs accounted for 55% of total lithium demand, but this number is expected to reach 84% by 2030. The balance is made up of consumer electronics (which too use lithium batteries, though much smaller than the EV batteries), energy storage, and other industrial applications. It has been projected that in order to fuel this growth, more lithium could be needed on a monthly basis in 2040 than all of the lithium mined in 2021.

Increasing Demand for Lithium in Glass and Ceramic Manufacture

The increasing demand for lithium in the glass and ceramic manufacture is another driver for the growth of the lithium industry. A variety of glasses like fiberglass, pharmaceutical glass, flat glass, container glass, and specialty glass which are designed to withstand wear and tear, corrosion, or extreme temperatures, all have begun to utilize lithium in their manufacturing. Lithium enhances the glass melt rate while decreasing viscosity and melting temperature, aiding the molding process, and allowing for higher output and energy saving. Lithium has also begun to be used in the manufacture of ceramics due to its ability to increase the strength in ceramic bodies and reduce firing temperatures. Demand has and is expected to continue to rise for lithium use in both glass and ceramic manufacturing.

Bromine

In 2022 the Business Research Company stated the global bromine market size was \$4.36 billion and is expected to grow to \$6.63 billion in 2027 at a CAGR of 8.3%. I have forecasted bromine to grow, though much slower and less than lithium. In 2026 I have forecasted the bromine segment to be roughly \$2 billion, up from about \$1.4 billion in 2022. This expected growth is due to a few key factors:





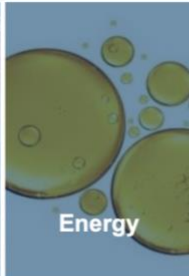


Increasing Demand for Flame Retardants

According to the National Fire Protection Association, in 2020, around 1.4 million fire incidents were reported in the US, causing a loss of \$21.9 billion of property. Additionally, with the growing demand for electrical and electronics products, coupled with various combustible materials in houses, flame retardants have become a crucial part of safety, thus, enhancing the market demand. Looking directly at the global flame-retardant market, MarketsandMarkets research estimates that by 2027 the market is expected to be \$9.2 billion growing at a CAGR of 5.1% from today. The growth is mainly triggered by the growth of end use industries like building and construction, automotive, and electronics and increasing regulations for fire safety. These industries must adhere to stringent fire safety standards increasing the demand for flame retardants.



Several countries across Europe and North America have mandated strict fire safety regulations and protocols. Bodies like the National Fire Protection Association and International Code Council have framed regulations for fire safety in response to

BROMINE IN OUR WORLD

	 Telecom	 Buildings	 Electronics	 Automotive	 Energy	 Consumer Polymers	 Ag / Pharma
	Wiring Connectors Circuit Boards	Insulation Wiring Connectors	Circuit Boards Enclosures Wiring	Tires Seats Wiring	Oilfield Completion Fluids	PET Textiles Packaging	Disinfectants Pharmaceuticals
Total Addressable Market	\$2.2B	\$1B	\$800M	\$500M	\$400M	\$375M	\$300M
5yr Industry Growth	3.5%	4%	5%	4%	3%	5%	2.5%

growing consumer demand for homes, electronics, and automobiles. All of these regulations are contributing to a greater demand for flame retardants and bromine.

Oil and Gas Drilling

One of bromine’s significant uses is in oil and gas drilling. Bromine used in the form of clear brines can compensate for the gravity required to balance the pressure needed to avoid closing the pores that are drilled into porous stone. According to Rystad Energy, a US based energy research and business intelligence company, global oil and gas drilling activity increased by 12% from 2020 to 2021 with around 54,000 wells drilled. This increase in drilling directly led to an increase in bromine consumption.

Electric Vehicles

Albemarle already has a solid base for flame retardants used in traditional gas-powered cars. Car parts like displays, wiring harnesses, sensors, and tires all rely on flame retardants. With the rise in popularity in EV’s, there are new needs in flame retardants for cars. High voltage wiring and battery casings are new opportunities with EV’s where bromine flame retardants can be utilized. Furthermore, charging stations require flame retardants in their wiring and foundations. The increased prevalence of EV’s is further adding to the addressable market for Albemarle bromine fire retardants.

Catalysts

Albemarle’s catalyst business is focused around the refining and petrochemical industries. According to Global News Wire the global oil refinery market is currently valued at \$563.3 billion and is projected to grow at a CAGR of 1.9% through 2032. The catalyst segment is expected to grow the slowest for Albemarle. By 2026 I have forecasted it to reach \$912 million, only up about \$200 million from 2022. This segment is falling out of focus for Albemarle as they seek to capitalize on lithium and bromine.

Growing Demand for Petroleum Product

Almost solely responsible for the growth of the industry over this time frame is an increased demand for petroleum product. Many of the smaller and less profitable refineries have and are expected to continue to shut down. Over the long term they are being replaced by larger scale and more complex refineries. Most of this growth is concentrated in the Middle East and Asia. It is estimated that there are currently 600 FCC units being operated globally, each of which requires a constant supply of



FCC catalysts. Adding on to this, there are approximately 3000 HPC units being operated globally. Each of these units typically require replacement HPC catalysts once every one to four years.

Industry Disruptors

Lithium

Environmental Concern

Lithium extraction has a significant environmental impact, mostly due to water depletion and pollution. In order to process lithium, toxic chemicals are required. These chemicals can be released through air emission, leaching, or spills, harming the ecosystem, food production, and communities. Lithium extraction inevitably damages soil and causes air pollution. Locals in Argentina near a lithium production site claim that lithium extraction operations have contaminated the streams used by them and their livestock. A mixture of potassium, magnesium, borax and lithium salts is created after brine is pumped out from beneath salt flats and allowed to evaporate. This leads to ground instability and biodiversity loss. One ton of lithium can require up to 2 million liters of water to extract. Most of this water is lost to the atmosphere by the time the product has been extracted.

Lithium Recycling

Another disruptor for the lithium industry is the lack of recycling. Many environmentalists are concerned with the lack of recycling of batteries after use and the harmful effects of lithium-ion battery disposal on the environment. Traditional car batteries are part of a recycling chain that goes into motion when a new battery is purchased. After you purchase a new car battery, you return your old one and the recycling chain begins. This process is yet to be put into place in the lithium-ion battery market due to the ever-changing nature of the market and government regulations. Many are calling on companies to begin to establish recycling chains which will require large amounts of capital and likely fall on the shoulders of lithium mining and car companies.

Sodium Ion Batteries

Another major threat to the lithium business is the emergence and potential of sodium ion batteries. Car companies are exploring new battery materials that rely on sodium ion as an energy source instead of lithium ion. There is ongoing research that has found sodium ion batteries to be cheaper and more environmentally friendly than lithium batteries. The main perk with sodium ion batteries is the cost. Lithium is currently around \$78,032 per metric ton. Sodium hydroxide on the other hand is below \$800 per metric ton. While companies struggle to find lithium at an inexpensive cost, they may begin to switch over to sodium ion batteries.

Bromine

Emergence of Non-Halogenated Flame Retardants

Traditional flame retardants use halogens like bromine and chlorine to inhibit the spread of fires. There is an emergence of new flame retardants that don't use halogens. This rise is due primarily to environmental initiatives driven to reduce the use of halogenated compounds. Recently the EU signed the green deal designed to drastically reduce the use of halogenated fire retardants and instead use non halogenated counterparts. This comes after the EU banned halogenated flame retardants in electronic displays and plastic enclosures. This is by far the largest risk for Albemarle's bromine segment. Luckily the company has developed many products involving bromine that will not be impacted by these new retardants, so they will still be able to generate revenue through this segment.

Decrease in Construction and Development

One of the most prominent uses of fire retardants is in construction and development. Fire extinguishers and other fire protection must be used at these points to ensure the projects adhere to strict regulations and run smoothly. As interest rates



rise and continue to, the number of new construction projects has decreased and is further expected to. This decrease is likely to weaken the overall bromine industry. This is not a very concerning risk for Albemarle as construction and development are not the biggest drivers of revenue in the bromine segment. They are well diversified in this segment to avoid taking a huge hit as a result in this decline.

Market Share

The global lithium market is pretty consolidated with the production and manufacturing concentrated between a few key players. Albemarle, SQM S.A., Livent Corp., Orocobre Ltd., Gangfeng Lithium Co., Ltd., and Tianqi Lithium are some of the major producers around the world. Most of their operations are all concentrated in the Americas, Asia, and Australia.

Like the lithium market, the bromine market is also relatively concentrated. The major players in this market are Albemarle Corporation, Israel Chemicals Ltd., Tata Chemicals Limited, Tosoh Corporation, LANXESS Corporation, TETRA Technologies, Inc., Honeywell International Inc., Perekop Bromine, Hindustan Salts Limited, and Gulf Resources Inc. Other than Honeywell in which bromine makes up a small part of their company, based on market cap, Albemarle is the largest of these companies with a market cap of \$35 billion. Israel Chemicals has a market cap of \$10 billion and Tata Chemicals has a market cap of \$3 billion.

Competitive Analysis

The SWOT analysis is a qualitative analysis used to evaluate a company's competitive position within their industry. The analysis looks at both internal and external factors to evaluate the strengths and weaknesses in a company as well as their present and future opportunities and threats. The analysis is used to help develop awareness of factors supporting and inhibiting the growth of the company.

SWOT Analysis

Strengths

- Balance sheet
 - Over 90% of debt position us at a fixed rate, safeguarding the company against impacts of rising interest rates
 - Over \$1 billion in cash and cash equivalents
- Strong Relationships with Foreign Governments
 - Signed a long-term deal with Chile to extract lithium from the country
 - The deal doesn't expire until 2043 giving stability in the operation
- Positioning in Lithium market
 - Already one of the largest companies in the lithium mining business
 - Can capitalize off of this positioning with increased demand

Weaknesses

- Work environment for employees
 - Relationships with employees have been iffy the past year
 - Poor conditions and low pay led to a strike in a Chilean mine last year that lasted over one month
- Vulnerability in fluctuations in raw material prices
 - Restructuring lithium contracts has exposed Albemarle to volatility in lithium prices far more than they used to be
 - If prices fall from the wild highs they are at now Albemarle could see a large decrease in revenue

Opportunities

- Rising lithium prices
 - Lithium prices are set to continue to rise well into 2023.



- Because of the way Albemarle's contracts are structured, they are well positioned to profit greatly off these increases.
- Massive increase in lithium demand
 - Albemarle forecasts have suggested the world would consume 1.8 million tons in 2025 and 3.7 million tons in 2030.
 - In 2020 the demand was just 292,000 tons.

Threats

- Sodium-ion Batteries
 - These lithium alternatives have shown to be much cheaper than lithium batteries
 - They also are much safer for the environment leading to a push for their adoption
- Non-Halogenated Flame Retardants
 - These alternatives to bromine flame retardants have shown to be much safer for the environment
 - Many countries have signed laws calling for the use of these instead of bromine flame retardants

Porter's Five Forces

The Porter's five forces analysis is used to identify and analyze five competitive forces that shape every industry. These forces are used to help determine an industry's weaknesses and strengths and can be used to guide a business's strategy to increase their competitive advantage.

Rivalry Amongst Sellers | High

- As lithium demand surges, lithium manufacturers are fighting in fierce competition to sell their product. Each company is fighting to gain the largest market share possible and sell the most of their product. Because of this, rivalry among sellers is very high.

Threat of Substitutes | Moderate

- The only current substitute seen for lithium-ion batteries are sodium ion batteries. At the moment, while these batteries have shown to be much cheaper than their lithium counterparts, they are only capable of holding about 2/3 as much power. Because of this stark technological difference between the two, there is not much threat for a substitute to the lithium-ion battery.
- In the bromine industry, there is a much larger threat of substitute. The emergence of non-halogen flame retardants and government policies to support them are an imminent threat for the bromine industry.

Pressure from Supplier Bargaining Power | Medium

- Pressure from suppliers in the mining industry (i.e., the countries that hold the raw materials) has been increasing in recent years. Nations like Zimbabwe have banned the export of lithium, except for cases with the written permission of the prime minister, to boost their economy and reap the benefits of the land they live on. This is not to say that private corporations still can't mine in Zimbabwe, but there has been a great increase in pressure as nations seek to capitalize on the rapid increase in demand for lithium.

Threat of New Entrants | Low

- The threat of new entrants into the mining business and specialty chemicals business is very low because these are very capital heavy industries. Furthermore, the places where mining is available around the world are already mostly controlled by all of the key players in the industries, and there are few areas that have been untouched and open to mine.



Pressure from Buyer Bargaining Power | Moderate - Low

- Across their different business, Albemarle serves a wide range of buyers. In the lithium market in specific, these buyers are at mercy of the current price of lithium. This does not give the buyers hardly any bargaining power. In other industries however, the bargaining power of buyers is higher as they can negotiate the terms of their deals more than lithium deals.

Financial Analysis

In my analysis of Albemarle, I included the DuPont analysis as well as other profitability ratios and the quick ratio to quantify the company's operations.

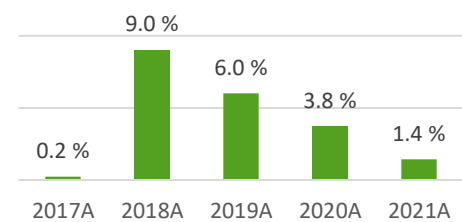
DuPont Analysis

The DuPont analysis is a method of breaking down a company's different drivers of return on equity. Using the DuPont method, I have found the return on assets, return on equity, and the return on invested capital which can all be used to evaluate Albemarle's income in greater depth.

Return on Assets (ROA)

The return on assets has not been very consistent for Albemarle the past 5 years. For the last 5 years the number has been anywhere from 0.2% to 9%. The incredibly low number in 2017 was due largely to the tax the company faced. In this year the company faced a massive tax rate of 96.6%. Since then, the rate has dropped significantly. The ROA has also dropped steadily over the last 5 years. If we look at Q3 2022 data however, the ROA spikes largely, up to 12.73% from the 1.4% in 2021. This spike is due to the massive increase in sales Albemarle saw over the year.

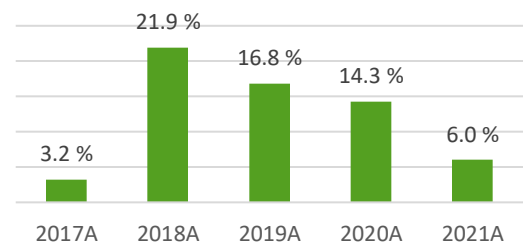
Return on Assets



Profit Margin

Like ROA, profit margin for Albemarle has not been very consistent in the last five years. Over this time range, the number has been anywhere from 3% to 22%. Again, the 2017 low was due largely to the massive tax that year. Since then, the decline is due in large part to expansion efforts and expenses. This number is terrible, but I would expect to see a higher profit margin in the future for Albemarle as they begin to realize more revenue from increased demand and higher lithium prices. Looking at Q3 of 2022, this is just what we saw as profit margin jumped to 27.77%.

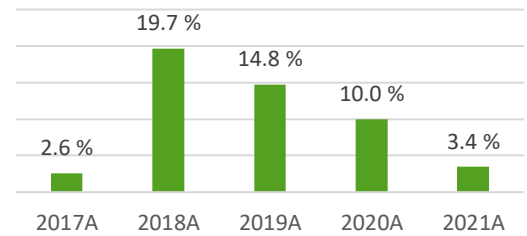
Profit Margin



Return on Equity (ROE)

Return on equity is used to provide insight into how efficiently a company is handling the money that shareholders have contributed to it. This is very similar to ROA, and the only difference comes in the measure assets. ROA accounts for debt in the calculations while ROE does not. Historically for Albemarle ROE has been all over the place. 2018 saw a sharp jump from 2017, followed by steady decline until 2021 where it dropped sharply again. Again, it was hurt by the tax rate in 2017 and then was also greatly hurt in 2021. 2021 EBIT was much lower than expected due to a \$657 million legal fee as part of an acquisition. This significantly hindered the ROE last year. Looking at Q3 this year, the ROE jumped to 24.74%.

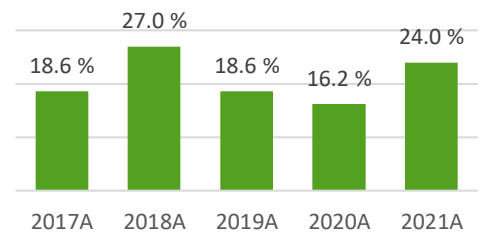
Return on Equity



Operating Margin

Operating profit margin is the operating profit (EBIT) divided by revenue, and measures how much operating profit the company can make for every dollar of revenue earned. The operating margin for Albemarle has not been incredibly consistent over the past 5 years. After a peak in 2018, the margin declined for two straight years, but has started to grow again. As we have seen with almost every ratio so far, 2022 saw a large spike in operating margin. At Q3 of 2022, Albemarle's operating margin had grown to 28.71%. This is a strong operating margin as the specialty chemicals industry average is 16.9%, showing that Albemarle can consistently return above the sector average.

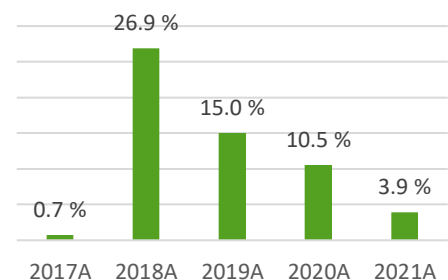
Operating Margin



Return on Invested Capital (ROIC)

ROIC is a good metric to look at as it gives us a sense of how well a company is using its capital to generate profits. Like many of the other ratios, the return on capital shows a large spike in 2018, then steadily declines to 2021. The incredibly small number in 2017 comes from the tax rate Albemarle had to pay that year, and the small number in 2021 is due to the legal settlement costing over \$600 million.

Return on Capital



Other Financial Ratios

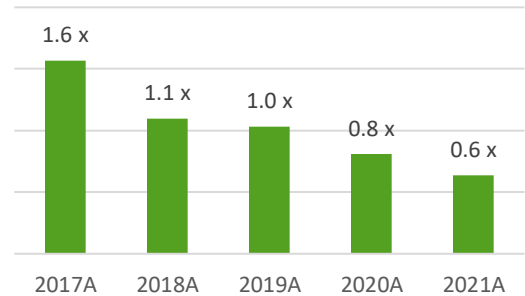
Quick Ratio

The quick ratio is a measure of a company's liquidity and financial solvency. It is calculated by dividing a company's total current assets minus inventory by the company's total short-term obligations. This ratio is often referred to as the "acid test ratio" because it is considered such a strong fundamental indicator of a company's basic financial health or soundness.

Historically the quick ratio has steadily declined for Albemarle. This decline is mostly due to the large amounts of growth and acquisitions that Albemarle have been making in the last 5 years. Investors like to see a quick ratio higher than 1 for mining companies. Because Albemarle

is not just a mining company, it is not extremely concerning to see this number dip below 1. It is also important to note that the 0.6 figure of 2021 is the lowest number on record for Albemarle. Since then, the number has grown to be larger than 1.

Acid Test/Quick Ratio



Valuation

Discounted Cash Flow (DCF) – 67% of Total Valuation

Revenue

My revenue forecasts follow management guidance for this year and the following years are based on the 5-year growth plan that management released in January. The first revenue projection (2022) is based heavily on the unofficial numbers from the 2022 fiscal year. This should result in a very accurate projection, or at least one with very small errors. The following year, 2023, is based on guidance that management has released. The rest of my revenue projections are based on the 5-year growth plan that has been released by management. Though these numbers show massive increases, I feel that they are an underestimate. Just last year in the 2021 Q4 earnings call, management expected revenue for 2022 to be

between \$4.2 and \$4.5 billion. Each quarter throughout the year, this number has been raised, and Albemarle is finishing the year at \$7.2 billion. While I do not think such an outperformance will occur again, I do feel that the total demand for lithium has not been completely realized. While

these are certainly advantageous goals, they are certainly feasible considering the central role that lithium is playing in our society right now and the positioning that Albemarle has to capitalize on the demand. There are a few risks to these projections. Most of these projections are based on the volume of production increasing for Albemarle and the prices of lithium to remain elevated. If Albemarle struggles in their operations while expanding, or if the prices of lithium fall (I will cover this more later), these revenue projections will differ greatly.

Cost of Goods Sold (COGS)

I projected COGS as a percentage of revenue. Historically this number has been about 65% of total revenue, though my projections differ from that. This year, using the unfinalized numbers, the COGS is roughly 48.5% of total revenue, a large

	FY 2023 Guidance as of Jan. 23, 2023
Net sales	\$11.3 - \$12.9 billion
Adjusted EBITDA	\$4.2 - \$5.1 billion
Adjusted EBITDA Margin	37% - 40%
Adjusted Diluted EPS	\$26.00 - \$33.00
Net Cash from Operations	\$2.1 - \$2.4 billion
Capital Expenditures	\$1.7 - \$1.9 billion

	Energy Storage	Specialties	Ketjen (Catalysts)	Total ^(a)
Net sales (5-Year CAGR)	25% - 27%	~5%	4% - 8%	19% - 21%
Adj. EBITDA Margin (2027E)	45% - 47%	32% - 36%	20% - 26%	41% - 44%
Adj. EBITDA (2027E)	\$6.4B - \$7.5B	\$0.7B - \$0.8B	\$0.2B - \$0.3B	\$7.2B - \$8.4B
Free Cash Flow (2027E)				\$2.6B - \$2.7B

(a) Total includes corporate costs not allocated to Albemarle's operating segments.



decrease from the years prior. An increase in lithium prices and increase in volume is the main reason for this decrease. The margins were much larger this year than years prior causing the COGS to be a smaller piece of revenue than in the past. I forecasted the COGS in the following years to grow from the 48.5% this year. This increase is not large, and over the span of the four years grows to be 54%. I think that this a fair projection because the higher margins will result in COGS percent of revenue being less than the historical average, but the increase gives room for the fluctuations in the price of lithium. These fluctuations could result in smaller margins than this year resulting in COGS making up a large portion of the total revenue.

Operating Expenses

Research and Development

I forecasted research and development costs to hold relatively steady over the next five years, but with a couple movements. Historically R&D expenses have remained quite constant for Albemarle, and in the next three years I expect that trend to continue. For the last two years of my projections, I forecasted these expenses to grow slightly. The increase is due to higher competition resulting in more research being done to find new ways of producing goods. This increase also provides a little bit of a safety net for my projections if these expenses increase before I project for some unforeseen circumstances.

Selling, General and Administrative

Like research and development, SG&A expenses have remained very constant for Albemarle the past 5 years. Going forward I expect this trend to continue. Because of this my forecasts reflect very little growth in terms of total SG&A expenses and a decrease in the percent of revenue going towards these expenses. As revenue rapidly grows, the expenses for SG&A should not be impacted.

Provision for Income Taxes

I have not forecasted much change in the tax rate for Albemarle in the next 5 years. In the coming two years I have forecasted it to taper down to 20.50%. This reduction is due to the effects of the Inflation Reduction Act in the United States which benefits companies producing goods for EV's. In 2025 I forecasted the tax rate to begin to rise again before it returns to the 22% in 2026. Aside from 2017, Albemarle's tax rate has been consistent, so I expect this to continue. The massive tax rate of 96.6% in 2017 was due to the enactment of the TCJA policy. This resulted in a one-time transition tax expense of \$429.2 million and caused the massive tax rate for that year.

Capital Expenditures

Capital expenditures are a massive expense for Albemarle. Recently these have been increased as part of their expansion plan. Acquisitions like the Qinzhou acquisition and the development of the Kemerton conversion plant in Australia are just some of the causes for the large capital expenditures. Historically CAPEX has been a much larger portion of revenue than what I have forecasted. I forecasted the 2022 capital expenditures using the unaudited numbers released through Albemarle in January of 2023. This helped me to gain an understanding of how these costs have changed with the increase in revenue. I was able to use management guidance to forecast CAPEX for 2023 as well. Management has not released any guidance for CAPEX after 2023. For the following years I expect CAPEX to grow, but to make up a smaller percentage of total revenue. I used both 2022 and 2023 CAPEX costs to forecast what it will look like in the following years with increased revenue. I have overestimated these expenses, but I feel that is a reasonable thing to do. Because we have only seen one full year with the large revenue increase, it is incredibly difficult to forecast how the large increase will affect CAPEX. Albemarle has also said they remain on the lookout for more strategic acquisitions and developments in the future which would cause these costs to rise. Forecasting these is nearly impossible, so the overestimates can cover some of the unknowns of this expense.

Beta

The beta from the 5-year beta that I selected was 1.54. This beta value had the highest r-squared value of all the observations at 42.3 and used weekly three-year observations. I do believe that this beta accurately reflects the risk of the stock relative to the overall risk of the market because the price of this stock has been very volatile, especially since 2020.



Terminal Value Calculations

I used the OSIG standard terminal growth rate of 3% and used 22% for my terminal tax rate. I feel the 22% terminal tax rate is a fair rate to use and might even be an overestimate. This number is excluding the potential effects of tax cuts related to EVs. Albemarle has already seen some tax cuts because of this and more may come. I am not confident in forecasting that out so kept the rate at 22%. I feel the terminal growth rate is also a fair value for the company. Although in the current moment they are growing incredibly fast, this is not going to last forever, especially in a business that involves extracting raw materials from the earth. The 3% growth is a reasonable assumption when looking much further into the future and past this massive growth phase that Albemarle is currently in. Because Albemarle is generating a profit, I did not use EV/Sales and instead opted to use EV/EBITDA. I also did not use the PGM because commodity-based companies like chemicals have high volatility (especially Albemarle) and the perpetual growth model assumes that the company will continue to outpace the market. While it is a distinct possibility that Albemarle will outpace the market in the coming years, I am not incredibly confident in their ability to outpace the market in the future, especially with the high beta.

Capital Asset Pricing Model (CAPM) & Weighted Average Cost of Capital (WACC) Presumptions

I used the CAPM and WACC to calculate the cost of equity, debt, and capital for Albemarle. To do this, I used the United States current risk-free rate of the 20-year treasury bonds of 3.7% and the current US equity risk premium of 5.9%. Because of the current inversion in bond yields between the 20-year and 30-year curves, I am using the 20-year as it is currently at a higher return. These calculations produced a total cost of equity of 12.8%. With Albemarle's credit rating of BBB, I calculated the cost of debt to be 5.3% and the overall cost of capital to be 12.1%.

CAPM Assumptions		mrkt
Beta		1.54
Equity Risk Premium		5.9 %
Risk Free Rate for Local Currency		3.7 %
WACC Assumptions		CAPM
Cost of Equity		12.8 %
Cost of Preferred Shares		
Cost of Debt		5.3 %
Credit Rating		BBB
Default Spread		1.6 %
LT Credit Yield		5.3 %
Cost of Capital		12.1 %

Overall, the EV/EBITDA model of my DCF produced a value of \$373.21 with a margin of safety of 28.7%.

Relative Model – 33% of Total Valuation

The purpose of the relative model is to compare Albemarle with companies of similar structure and in the same industry. I have identified three companies within the speciality chemicals industry that focus on similar areas to Albemarle. These are the companies that I have based my relative model on:

The first company that I have weighted in my relative model is DuPont de Nemours. Commonly known as DuPont, they too are a specialty chemicals company. I chose to weight DuPont at 40% of the model because of a couple distinct similarities between them and Albemarle. DuPont and Albemarle have very similar market caps and similar betas. Additionally, the difference between Albemarle and DuPont's ROE and ROA and Debt/Equity was very small. Another large reason that I wanted to include DuPont in the relative model is because they are a direct competitor of Albemarle in the catalysts market. They also are beginning to expand to lithium and bromine products, though not on the scale of Albemarle.



The second company that I included in the relative model is Sociedad Quimica y Minera de Chile (SQM). I also weighted SQM at 40% of the relative model because of the fact that they are one of the main competitors for Albemarle in the lithium market. They are the same as DuPont because although



they are Albemarle’s largest competitor, their financial ratios are not nearly as similar to Albemarle’s as DuPont’s. That being said, their market cap is close to Albemarle’s at \$26.52 billion.

The final company that I included in my relative model is Dow Inc. Like SQM and DuPont, Dow is another specialty chemicals company. I weighted Dow 20% because they have less similarities in terms of products than SQM or DuPont. They are also very large company that is involved in more than just chemicals, so because of that I weighted them less than the other two companies. They do have a similar market cap and beta, but because of the differences in product offerings, I have weighted them less of the relative model.



Multiples

P/E – 75%

I weighed P/E 75% on my relative model. I felt that it was important to compare the price to earnings between Albemarle and their competitors. The P/E ratio allows us to quickly compare if companies are overvalued or undervalued relative to their industry. Between the companies that I weighted there were large differences in P/E ratios. This is most likely because the specialty chemicals industry is incredibly broad so it can be very difficult to classify overweight or underweight across so many different businesses and products.

EV/EBITDA – 25%

In my relative model I also thought that it was very important to include EV/EBITDA. I weighed it at 25% because the ratio not only shows us how well a company turns a profit, but also does not incorporate taxes into the calculation. Many of Albemarle’s competitors, especially the ones I weighed in the model, are companies that do a great deal of international business, and this are subject to a wide range of taxes. I felt it was important to remove the effects of that to compare them better with their peer companies.

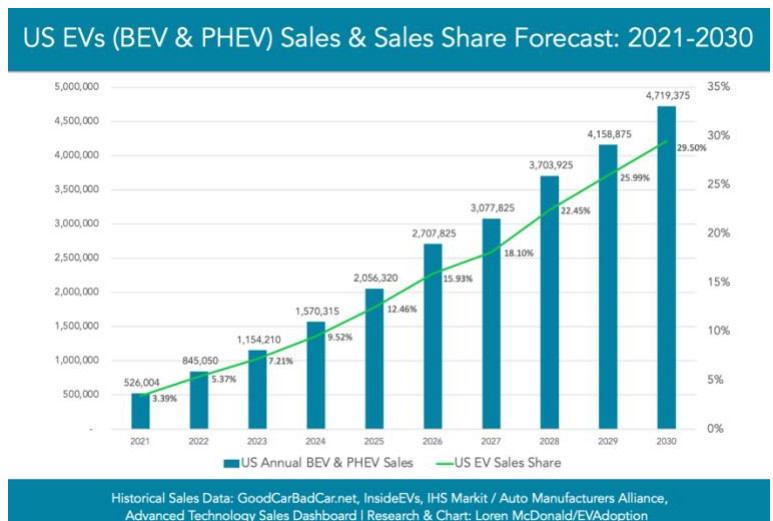
Overall the relative model produced a value of \$289.48 with a margin of safety of (0.16)%.

Catalysts for Long-Term Growth

In my research, I have identified three catalysts for long-term:

Increased EV Demand

Easily the largest catalyst for growth for Albemarle is the massive increase in demand for electric vehicles. This boom is benefitting not only the lithium segment of the business but also the bromine business. Through the third quarter of 2022, US EV sales had surged 70.7% and in the first half of the year global EV sales rose 62%. A lot of this growth is a result of government policies supporting the purchase of EV’s. The European Union and California both recently banned the sale of new cars with internal combustion engines (gas cars) beginning in 2035. The EU and California also will require that EVs compose 55% and 68%, respectively, of all new car sales by 2030. The US federal government has also established goals and policies that support the purchase of EVs. In the 2021 Infrastructure Investment and Jobs Act the US government earmarked

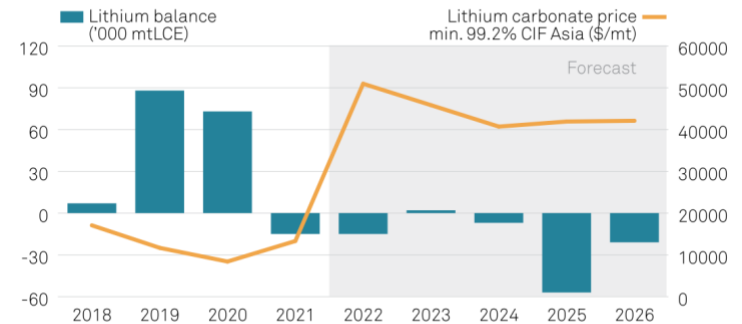


\$7.5 billion in funding to build a network of 500,000 EV charging stations. In August President Biden signed the Inflation Reduction Act into law which included many tax credits for the purchase of EVs. All of this has boosted the demand for EVs and thus increased growth for Albemarle. Each EV battery requires about 12kg of lithium. The increase in EV demand also benefits the bromine segment of Albemarle’s business. Though not as integral to the production of EVs as lithium, many of Albemarle’s bromine-based fire retardants are being used in the wiring of EVs and charging stations. As more cars are produced, more lithium is necessary from suppliers like Albemarle. In the past year they have capitalized on this growth and are looking to more in the future.

Restructured Contracts to Capitalize On Strong Lithium Prices

Another catalyst for growth for Albemarle is the strong lithium prices. These prices have followed the massive increase in demand for the material. In October 2022, prices for battery grade lithium carbonate in China hit an all-time high of \$74,475 per ton. While the number has fallen slightly since then, this was a massive increase from the prior years, and was mostly due to the increased demand of the metal due to rapid expansion in the EV market. This number is not expected to fall very much in 2023. In 2022, the lithium market saw an incredibly large shortage that has send EV giants Tesla and Ford exploring options to mine their own lithium. The shortage is expected to last well into 2023 and is a large reason for

Lithium prices peak in 2022, to remain above \$40,000/mt to 2026

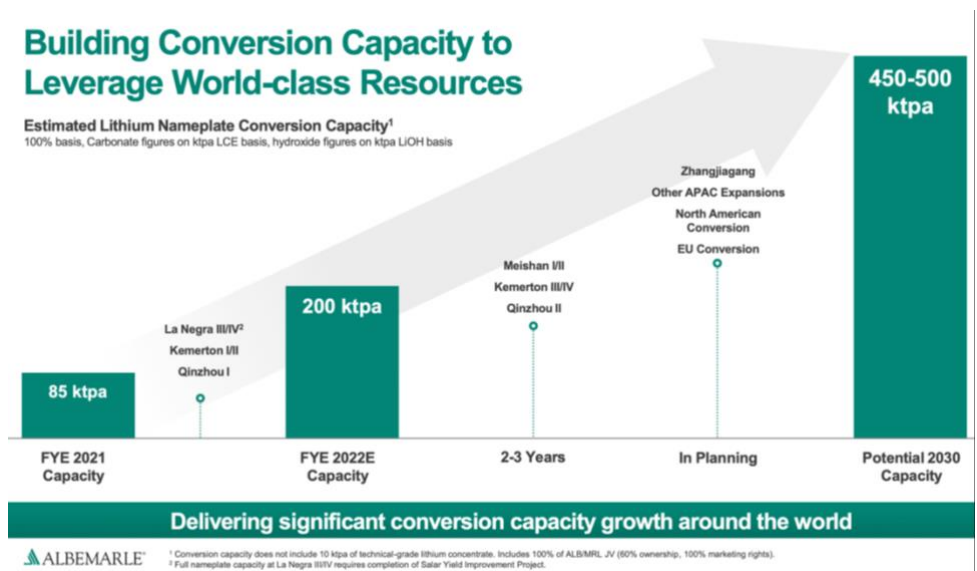


As of 23 November, 2022. LCE=Lithium carbonate equivalent
Source: S&P Global Market Intelligence

the prices to remain high. Albemarle is currently working on changing the price structure of a few remaining contracts to capitalize on these prices. In the past Albemarle has followed long term contracts with pricing negotiated at the signing of the deals. They have since changed the structure of almost all of their contracts to follow a market index, allowing them to profit on the much higher prices. In the past the long-term contracts were attractive to investors who sought to limit exposure to the volatility of lithium markets. Looking to the future however, the incredibly high prices are expected to continue leaving Albemarle in a positive position to generate increases in revenue each year. For example, in Q3 of 2022, realized pricing of lithium for Albemarle was up nearly 300% versus the same quarter in the year prior.

Lithium Production Expansion

One more catalyst for Albemarle’s growth is the increase in production capacity. In 2022 Albemarle doubled their lithium conversion capacity thanks to the acquisition of the Qinzhou lithium conversion plant in China and the mechanical completion of the Kemerton 2 lithium conversion project in Australia. Albemarle has also put \$500 million into the construction of the Le Negra III/IV chemical conversion plant. These three plants contributed to volume improvement in Q3 of nearly 30%. In 2023 management expects volume growth to be north of 30% as these



ALBEMARLE
1 Conversion capacity does not include 10 ktpa of technical-grade lithium concentrate. Includes 100% of ALBMRL JV (80% ownership, 100% marketing rights).
 2 Full nameplate capacity at La Negra III/IV requires completion of Salar Yield Improvement Project.



plants continue to ramp up additional tolling volumes. Looking to the future, Albemarle is currently in the process of constructing numerous other plants to increase volumes. The Kemerton I plant in Australia continues qualification and is expected to produce qualification samples by the end of 2022 (at the time of this writing no news has been provided about the status of samples). There is also progress being made with engineering the Kemerton III and IV projects in Australia -- orders have been placed for long lead-time equipment. Looking to China, the construction of the 50,000-ton-per-year Meishan lithium hydroxide facility is progressing to plan. In the United States, the expansion to double production at the Silver Peak mine is progressing ahead of schedule. Albemarle is also building a Megaflex site at their Kings Mountain lithium mine that is expected to be online later this decade, most likely around 2027. All of these projects are designed to increase production and allow Albemarle to manufacture lithium to meet demand and increase revenues and profits.

Risks to Projections and Expectations

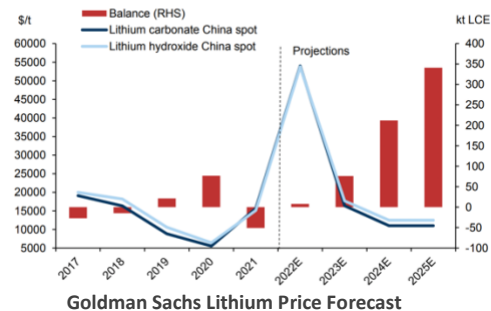
The Potential Decrease in Lithium Prices

As I previously mentioned, lithium prices have shot up in the past year. This has caused a great deal of speculation about where the prices are going to go in the future. While I asserted previously that these prices will remain high, supported by the demand for EVs, there is a distinct chance that prices fall steeply. Albemarle would be very exposed to these drops as the contracts they use leverage an index-based pricing structure. In April 2022, Goldman Sachs released a report predicting a strong correction in the prices of lithium. They expected this correction to be a result of a surplus of lithium product. As lithium companies like Albemarle race to increase production volumes, Goldman expects this increase to pile up resulting in a surplus. As simple economics tell us, this will cause a decrease in prices for the metal. While this is certainly a possibility, I do not feel that the prices for lithium will drop as sharply as Goldman expects. When this report was published, China was still in a zero-covid policy which significantly inhibited the expected demand for EVs from China. Chinese EV demand has instead been even larger than expected, leading to the support in lithium prices. Furthermore, since the publishing of this report, the actual prices of lithium have not followed the predictions put in place by Goldman, signaling that they will perform different than the Goldman analysts forecasted.

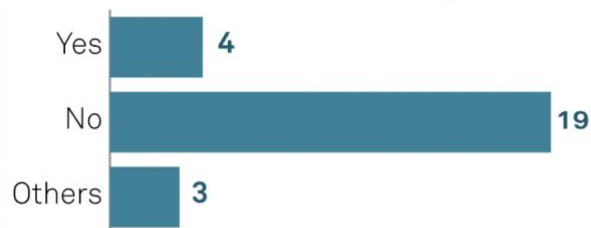
A Shift From Lithium-Ion Batteries to Sodium-Ion Batteries

Another risk for Albemarle is a shift from lithium-ion batteries to sodium-ion batteries. As I previously covered in this report, sodium-ion batteries are much cheaper to produce compared to lithium-ion batteries. Because of this, there is a great deal of research being done to explore the potential of these batteries. This also comes as an effect of the surge in lithium prices. When lithium prices skyrocketed over the last year, battery companies like Contemporary Amperex Technology Co. Limited (CATL) began to produce sodium-ion batteries for EVs. While these batteries are much cheaper and environmentally friendly than traditional lithium-ion batteries, I do not expect them to have a large impact on Albemarle's business. The main weakness of these batteries is their limited range in comparison to their lithium counterparts. As of right now, sodium-ion batteries have shown to be far less capable of producing as much energy as the

Exhibit 22: We expect a sharp correction in Lithium fundamentals with carbonate and hydroxide price to fall 70% y/y and 67% y/y respectively in 2023



Do you expect sodium-ion battery to start mass production and subdue the demand for lithium-ion battery in 2023?



Results from a survey of 26 Asian market companies



lithium-ion batteries, and thus less distance in battery charge for EVs. According to a Consumer Reports survey, when consumers are looking for EVs, they are most concerned about the driving range of the car. Sodium-ion batteries are unable to compete with the range offered in lithium-ion batteries right now which is why I do not see them as a massive threat to Albemarle now.

Delays or Issues in Construction and Expansion of Lithium Production Plants

One more risk for Albemarle is the potential for delays or issues in the construction and expansion of lithium production and conversion plants. Albemarle's future expectations and my projections are all based on the assumption that the plants they are currently in the process of developing are completed according to the timeline. These projects, designed to scale volumes by large amounts, are pivotal in the future revenue projections. If for some reason these projects were to be delayed or impacted in any other way, Albemarle would be missing out on projected revenue. While it always is a possibility that a delay like this could occur, I am confident that the expansion plans will continue to move according to schedule. Already one of the projects is moving ahead of schedule, and the others are all following the timeline perfectly.

Portfolio Recommendation

We currently do not hold any positions in Albemarle. Currently, the IMEU sector is 19.28% of the large-cap portfolio. The S&P 500 currently has the IMEU equivalent weighting of roughly 18% (because IMEU is a combination of a few different sectors this number is not exact). I am suggesting a buy, which would send the sector to be overweight relative to the overall market. To keep the portfolio balanced I am suggesting a buy of ALB paired with a shave of PXD and NEE. Currently PXD and NEE are 27.4% and 23% of the IMEU sector, respectively. I am suggesting shaving them to around 20-22%, and then taking that money to initiate a position in ALB.

Corporate Governance

Albemarle has 10 board members, 9 of which are independent and CEO Kent Masters being the only non-independent board member.

Executive Members

- J. Kent Masters Jr. – Chairman, President, and Chief Executive Officer - \$9,040,753
- Scott A. Tozier – Executive Vice President, Chief Financial Officer - \$2,662,322
- Eric W. Norris – President, Lithium - \$2,583,030
- Netha N. Johnson Jr. – President, Bromine - \$2,389,674
- Karen G. Narwold – Executive Vice President, Chief Administrative Officer - \$2,431,607

The only recent news involving the executive members of the company is a video that CEO Kent Masters released discussing the results of the year and what to expect going forward. The absence of any other news is a good sign, showing company stability and a scandal-free leadership group.

Independent Members

- James J. O'Brien – Former President, Valvoline; Former CEO and Chairman of the Board, Ashland Inc.
- Laurie Brlas – Former Executive Vice President and CFO, Newmont Mining Corp.
- Ralf H. Cramer – Former President and CEO, Continental China; Former Executive Board Member, Continental AG
- Glenda J. Minor – Former Vice President and CFO, Evraz North America Limited
- Diarmuid B. O'Connell – Former Vice President, Tesla Motors Inc.
- Dean L. Seavers – Former President, National Grid U.S.
- Gerald A. Steiner – Former CEO and Co-Founder, CoverCress Inc.



- Holly A. Van Deursen – Former Group Vice President, BP Corporation
- Alejandro D. Wolff – Former US Ambassador to the United Nations and Chile

Environmental, Social, and Governance (ESG) Observations

The chemical business is historically notoriously bad in the ESG department. Both the lithium and bromine mining business requires large amounts of water and other chemicals to extract the materials. This has led to poor ESG scores for companies within these industries in the past. Albemarle is aiming to reduce their environmental impact which still increasing production.

Environmental

Some of the main environmental goals that Albemarle has in the coming years are reducing the intensity of freshwater usage by 25% by 2030 in areas of high and extremely high water-stress, growing the lithium business in a carbon-intensity neutral manner through 2030, reducing the carbon-intensity of the catalysts and bromine businesses by a combined 35% by 2030, and achieving net zero carbon emissions by 2050.

Last year, Albemarle began executing its climate strategy and the company is on track to meet or exceed initial sustainability targets for GHG emissions and freshwater intensity. Albemarle also announced its initial assessment of scope 3 GHG emissions, including areas such as purchased goods and services, processing of sold products, use of sold products, and end-of-life treatment of sold products. The company will continue to refine its assessment in the coming years and will use the initial assessment to work with customers and suppliers to reduce emissions across the supply chain.

Natural Resource Management

Responsibly manage our use of resources and materials

Sustainable Shareholder Value

Foster the conditions that create sustainable value for shareholders



Social

Albemarle has a few key goals related to social policies. This includes achieving top decile occupational safety performance relative to their American Chemistry Council peers, increasing global gender diversity by a further 1% year-over-year with a particular focus on manufacturing, and increasing U.S. racial diversity in senior-level management roles by 1% year-over-year.

In 2020, Albemarle appointed a Vice President Diversity Equity & Inclusion (DE&I), who is responsible for the DE&I strategy. Gender equality is an important dimension of this strategy. Women-led Connect Groups, women talent development and unconscious bias training are examples of Albemarle’s approach and contribution to gender equality goals.

Governance

Albemarle has 5 different committees designed to mitigate risk and oversee compliant practices in the business. They are as follows.

The Audit & Finance Committee is primarily responsible for risk oversight relating to financial statement integrity, cybersecurity, and ERM (Enterprise Risk Management).

The Executive Compensation Committee is primarily responsible for risk oversight related to human resources and potential risks relating to our employee (including executive) compensation programs.

The Nominating & Governance Committee is primarily responsible for risk oversight relating to corporate governance.



The Health, Safety & Environment Committee is primarily responsible for risk oversight relating to the effectiveness of our health, safety, and environment protection programs and potential risks relating to our sustainability programs.

The Capital Investment Committee is primarily responsible for risk oversight relating to major capital expenditure projects.

Investment Summary

My analysis leads me to conclude that Albemarle Corporation is a fundamentally sound company. The company's potential for growth is large thanks to its positioning in the lithium industry and plans for expansion. Albemarle has built strong position in the lithium industry and with the massive increase in EV demand is capitalizing on the positioning. The company is also positioned to and focused on improving its volume output. Through the acquisition of conversion plants and the expansion of current plants, they are looking to triple their production by 2030. Based on my findings I arrived at an intrinsic value of **\$345.58** and a margin of safety of **19.2%**. I am confident that this value accurately represents the fair value per share, **distinctly undervalued by the markets**. I expect Albemarle to bridge the value gap as investors begin to fully understand the true demand for lithium, understand the massive shortage of lithium and its effects on prices, and realize the powerful effect of shifting contracts to a market index model. I, therefore, recommend a **strong buy** for Albemarle Corporation.

***Disclosure:** I have no positions in any stocks mentioned, and no plans to initiate any positions within the next 72 hours.*

I wrote this report myself, and it expresses my own opinions. I am not receiving compensation for it. I have no business relationship with any company whose stock is mentioned in this equity report. This report is written explicitly for the Oregon State Investment Group; however, I hold the right to distribute this document to potential employers or for other educational purposes as a sample of my work.

Signed:

[Parker Meredith]

[2/6/2023]



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Appendix

ALB
Company Name

Valuation

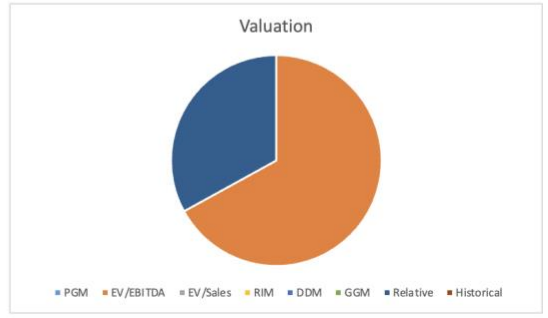
Valuation Method	Value	MoS	Weight	Current Price	Intrinsic Value	Price Target
PGM	325.53	12.3 %	0.0 %	259.94	346.32	2/10/24 389.91
EV/EBITDA	373.21	28.7 %	67.0 %	269.94	346.90	2/10/25 439.93
EV/Sales	266.56	(8.1)%	0.0 %	279.94	347.23	2/10/26 496.36
RIM	266.75	(8.0)%	0.0 %	289.94	347.23	2/10/27 560.04
DDM	20.69	(92.9)%	0.0 %	299.94	346.90	2/10/28 631.88
GGM	16.35	(94.4)%	0.0 %	309.94	346.32	
Relative	289.48	(0.2)%	33.0 %	319.94	345.58	
Historical	1,338.86	361.8 %	0.0 %			
Intrinsic Value Per Share	345.58	19.2 %	100.0 %			
Market Price	289.94					
Cost of Capital	12.07 %					



Recommendation

Porfolio	Large-Cap
Date of Pitch	2/10/23
Analyst	Parker Meredith
Coverage Type	Initiation
Buy/Hold/Sell	Buy
Update Frequency	
Next Earnings Date (Q?)	2/15/23

Summary
With a price target of \$345.58 per share, I am recommending a Buy



ALB

Company Name

Forecasts

# of Years Discounted	2025										Underlying Assumptions					
	2017A	2018A	2019A	2020A	2021A	2022E	2023E	2024E	2025E	2026E	Growth	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Period Ending											Revenue Growth	118.04 %	64.61 %	11.92 %	9.61 %	7.67 %
Income Statement:											% of Revenue	48.30 %	49.40 %	50.00 %	53.00 %	54.00 %
Net sales	3,071,976	3,374,950	3,589,427	3,128,909	3,327,957	7,256,226	11,944,312	13,368,193	14,652,533	15,776,241	% of Revenue	7.00 %	5.00 %	4.00 %	3.00 %	3.00 %
Cost of goods sold	1,965,700	2,157,694	2,331,649	2,134,056	2,329,986	3,504,757	5,900,490	6,684,096	7,765,842	8,519,170	% of Revenue	0.93 %	0.60 %	0.50 %	0.50 %	0.60 %
Gross profit	1,106,276	1,217,256	1,257,778	994,853	997,971	3,751,469	6,043,822	6,684,096	6,886,690	7,257,071	% of Revenue	0.00 %	0.09 %	0.00 %	0.00 %	0.00 %
Selling, general and administrative expenses	450,286	446,090	533,368	429,827	441,482	507,936	597,216	601,569	732,627	788,812	% of Revenue	(1.81) %	(1.90) %	(1.90) %	(1.90) %	(1.90) %
Research and development expenses	84,330	70,054	58,287	59,214	54,026	67,483	71,666	66,841	87,915	94,657	% of Revenue	(0.80) %	(0.50) %	(0.47) %	(0.44) %	(0.37) %
Gain on sale of business	-	(210,428)	-	-	(295,971)	-	-	-	-	-	% Revenue	8.30 %	5.50 %	4.30 %	4.30 %	5.00 %
Operating profit	571,660	911,540	666,123	505,812	798,434	3,176,050	5,374,940	6,015,687	6,066,149	6,373,602	% Revenue	(5.50) %	(5.00) %	(5.00) %	(5.00) %	(5.00) %
EBIT	562,148	847,106	620,645	446,635	195,094	3,118,000	5,315,219	5,852,856	6,001,677	6,315,229	% Revenue	(1.00) %	(1.00) %	(1.00) %	(1.00) %	(1.00) %
Interest and financing expenses	(115,350)	(52,405)	(57,695)	(73,116)	(61,476)	(131,338)	(126,942)	(253,996)	(278,398)	(299,749)	% Revenue	7.00 %	7.00 %	7.00 %	7.00 %	7.00 %
Other expenses, net	(9,512)	(64,434)	(45,478)	(59,177)	(603,340)	(58,050)	(59,722)	(62,831)	(64,471)	(58,372)	% Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Income before income taxes and equity in net income of unconsolidated investments	446,798	794,701	562,950	373,519	133,618	2,986,663	5,088,277	5,698,861	5,723,279	6,015,481	% Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Effective Tax Rate	96.6 %	18.2 %	15.7 %	14.6 %	22.0 %	22.00 %	21.00 %	20.50 %	21.00 %	22.00 %	% Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Income tax expense	431,817	144,826	88,161	54,425	29,446	657,066	1,068,538	1,168,266	1,201,889	1,323,405	% Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Income before equity in net income of unconsolidated investments	14,981	649,875	474,789	319,094	104,172	2,329,597	4,019,739	4,530,594	4,521,391	4,692,075	% Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Equity in net income of unconsolidated investments (net of tax)	84,487	89,264	129,568	127,521	95,770	602,267	656,937	574,832	630,059	788,812	% Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Net income	99,468	739,139	604,357	446,615	199,942	2,931,863	4,676,676	5,105,426	5,151,450	5,480,887	% Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Net income attributable to Albemarle Corporation	94,850	693,562	533,228	375,264	129,672	2,725,539	4,374,485	4,771,222	4,807,115	5,118,034	% Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Basic earnings per share (in dollars per share)	0.49	6.4	5.03	3.53	1.07	23.77	38.53	42.45	43.20	46.46	% Growth	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Diluted earnings per share (in dollars per share)	0.49	6.34	5.02	3.52	1.06	23.62	38.30	42.20	42.94	46.18	% Growth	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Weighted-average common shares outstanding—basic (in shares)	110,914	108,427	105,949	106,402	115,841	114,683	113,536	112,400	111,276	110,164	% Total Current Assets	34.00 %	31.00 %	28.00 %	27.00 %	26.00 %
Weighted-average common shares outstanding—diluted (in shares)	112,380	109,458	106,321	106,808	116,536	115,371	114,217	113,075	111,944	110,825	% of Revenue	71.00 %	70.00 %	68.00 %	67.50 %	65.00 %
Cash dividends declared (in dollars per share)	1.28	1.34	1.47	1.54	1.56	1.55	1.54	1.53	1.52	1.51	% of Current Liabilities	7.00 %	8.00 %	11.00 %	13.00 %	15.00 %
											% of Revenue	35.00 %	38.00 %	42.00 %	47.00 %	51.00 %
Balance Sheet:											% of Revenue	4.00 %	5.00 %	5.50 %	6.50 %	7.00 %
Cash and cash equivalents	1,137,303	555,320	613,110	746,724	439,272	1,751,653	2,591,916	2,545,304	2,670,424	2,666,185	% of Revenue	(18.50) %	(15.00) %	(14.00) %	(14.00) %	(13.50) %
Total current assets	2,477,563	1,998,421	2,225,109	2,206,184	2,007,981	5,151,920	8,361,018	9,090,371	9,890,460	10,254,557	% of Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Current portion of long-term debt	422,012	307,294	187,316	804,677	389,920	177,778	363,107	617,610	895,270	1,206,882	% of Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Total current liabilities	1,200,925	1,183,173	1,408,996	1,801,849	1,874,335	2,539,679	4,538,839	5,614,641	6,886,690	8,045,883	% of Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Statement of Cashflows:											% of Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Depreciation and amortization	196,928	200,698	213,484	231,984	254,000	290,249	597,216	735,251	952,415	1,104,337	% of Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %
Capital expenditures	(317,703)	(699,991)	(851,796)	(850,477)	(953,667)	(1,342,402)	(1,791,647)	(1,871,547)	(2,051,355)	(2,129,793)	% of Revenue	1.00 %	1.00 %	1.00 %	1.00 %	1.00 %

DCF



DCF											
FCFF:											
Sales	3,071,976	3,374,950	3,589,427		3,128,909	3,327,957	7,256,226	11,944,312	13,368,193	14,652,533	15,776,241
EBIT	562,148	847,106	620,645		446,635	195,094	3,118,000	5,315,219	5,952,856	6,001,677	6,315,229
EBITDA	759,076	1,047,804	834,129		678,619	449,094	3,408,249	5,912,434	6,688,107	6,954,092	7,419,566
Non-Cash Working Capital	561,347	567,222	390,339		462,288	84,294	1,038,366	1,593,371	1,548,037	1,228,615	749,371
Δ Non-Cash Working Capital		5,875	(176,883)		71,949	(377,994)	954,072	555,005	(45,335)	(319,422)	(479,243)
Cash From Operations	215,777	887,553	913,816		541,591	784,094	1,768,217	4,241,233	5,513,106	6,013,162	6,509,459
Capital Expenditures	(317,703)	(699,991)	(851,796)		(850,477)	(953,667)	(1,342,402)	(1,791,647)	(1,871,547)	(2,051,355)	(2,129,793)
Unlevered Free Cash Flow (FCFF)	(101,926)	187,562	62,020		(308,886)	(169,573)	425,816	2,449,586	3,641,559	3,961,807	4,379,667
PV of FCFF							413,852	2,124,279	2,817,742	2,735,283	2,698,020
<i>Growth Rate</i>							(351.1)%	475.3%	48.7%	8.8%	10.5%
Capital Structure											
MV of Equity	91.3 %	34,174,938									
Preferred Shares	0.0 %										
BV of Debt	8.7 %	3,245,750									
Operating Leases	0.3 %	126,997									
Long-term debt	8.3 %	3,118,753									
CAPM Assumptions											
Beta		1.54									
Equity Risk Premium		5.9 %									
Risk Free Rate for Local Currency		3.7 %									
WACC Assumptions											
Cost of Equity		12.8 %									
Cost of Preferred Shares											
Cost of Debt		5.3 %									
Credit Rating		BBB									
Default Spread		1.6 %									
LT Credit Yield		5.3 %									
Cost of Capital		12.1 %									
Valuation											
Σ of PV of Future Cash Flows		10,789,176					10,789,176				
Terminal Tax Rate		22.0 %					22.0 %				
Terminal Growth Rate		3.0 %					4.3 %				
Exit Multiple		n/a					7.9 x				
PV of Terminal Value		30,625,479					36,245,640				
Enterprise Value		41,414,655					47,034,816				
+ C&CE		439,272					439,272				
+ Investments & Other		(6,488)					(6,488)				
- Debt		3,245,750					3,245,750				
- Minority Interests		231,991					231,991				
- Preferred Shares		-					-				
Equity Value		38,369,698					43,989,859				
Shares Outstanding (Diluted)		117,869					117,869				
Intrinsic Value Per Share		325.53					373.21				266.56

ALB																	
Company Name																	
Relative																	
Relative Model Inputs																	
Discount Period	0.25	Ticker	ALB	SQM	CF	MOS	IFF	MTX	NEU	ICL	DD	DOW	Multiple	Value	Discounted	MoS	Weight
Sales (ntm)	7,256,225.71	P/E (ttm)	20.1 x	8.6 x	5.6 x	4.7 x	19.7 x	15.2 x	16.8 x	5.0 x	23.3 x	7.5 x	14.3 x	329.74	319.94	10.35 %	75.0 %
EPS (ntm)	23.12	P/S (ttm)	5.6 x	3.1 x	1.6 x	1.0 x	2.2 x	1.0 x	1.3 x	1.1 x	2.2 x	0.7 x	2.2 x	137.90	133.80	(53.85)%	
Book Value (ntm)	5,747,482.84	P/BV (mrq)	4.6 x	5.8 x	3.8 x	1.4 x	1.7 x	1.4 x	5.1 x	2.0 x	1.5 x	2.3 x	3.3 x	163.06	158.21	(45.43)%	
EPS Growth (5 yr exp.)	112.682 %	PEG (5 yr expected)	0.33	0.15	0.60	0.62	1.17	n/a	n/a	n/a	1.71	n/a	0.7 x	1,938.56	1,880.94	548.74 %	
EBITDA (ntm)	3,408,249	EV/EBITDA (ttm)	16.9 x	5.7 x	2.9 x	3.4 x	15.3 x	9.5 x	11.3 x	3.1 x	11.6 x	5.0 x	7.9 x	204.54	198.10	(31.67)%	25.0 %
Cost of Equity	12.8 %	EV/Sales (ttm)	5.9 x	2.9 x	1.6 x	1.1 x	3.1 x	1.4 x	1.6 x	1.3 x	2.7 x	0.9 x	2.4 x	125.21	121.00	(58.27)%	
Cost of Capital	12.1 %	Custom Ratio											0.0 x	-	-	(100.00)%	
Custom Ratio		Weight		40.0 %													100.0 %
C&CE (mrq)	439,272	Additional Information															
Investments & Other (mrq)	(6,488)	Ticker	ALB	SQM	CF	MOS	IFF	MTX	NEU	ICL							
LT Debt (mrq)	3,118,753	Beta	1.54	0.95	1.08	1.55	1.07	1.27	0.33	0.4	1.3	1.3					
Minority Interest (mrq)	231,991	Debt/Equity (mrq)	34.5 %	57.6 %	45.7 %	37.1 %	67.2 %	69.3 %	160.7 %	50.0 %	48.3 %	78.6 %					
Preferred shares (mrq)	-	Return on Equity	3.4 %	77.4 %	59.6 %	33.6 %	(9.1)%	9.6 %	28.6 %	43.2 %	6.5 %	23.2 %					
Diluted Shares (mrq)	117,869	Return on Assets	1.4 %	32.9 %	27.7 %	15.0 %	2.3 %	4.9 %	8.2 %	19.2 %	3.9 %	6.0 %					
		Market Cap (\$BN):	34,174.94	26.54	16.66	16.50	28.26	2.14	3.37	10.26	36.63	40.90					

ALB											
Company Name											
# of Years Discounted	0.25	1.25	2.25	3.25	4.25						
Period Ending:	2017A	2018A	2019A	2020A	2021A	2022E	2023E	2024E	2025E	2026E	
Segments Growth Rates											
Revenue	3,071,976	3,374,950	3,589,427	3,128,909	3,327,957	7,256,226	11,944,312	13,368,193	14,652,533	15,776,241	
Revenue by Product Segment											
Lithium	1,308,153	1,228,171	1,358,170	1,144,778	1,363,284	5,057,784	9,458,055	10,687,603	11,809,801	12,813,634	
Bromine	855,143	917,880	1,004,216	964,962	1,128,343	1,399,145	1,650,991	1,816,091	1,952,297	2,049,912	
Catalysts	778,304	1,101,554	1,061,817	797,914	761,235	799,297	835,265	864,499	890,434	912,695	
Underlying Assumptions											
Growth	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5						
Revenue Growth	118.04 %	64.61 %	11.92 %	9.61 %	7.67 %						
	271.00 %	87.00 %	13.00 %	10.50 %	8.50 %						
	24.00 %	18.00 %	10.00 %	7.50 %	5.00 %						
	5.00 %	4.50 %	3.50 %	3.00 %	2.50 %						



Segment Growth Rates

Segments	2017A	2018A	2019A	2020A	2021A	3-Year Calculations		
						Mean	Median	Slope
Net sales	3,071,976	3,374,950	3,589,427	3,128,909	3,327,957			
YOY		9.9 %	6.4 %	(12.8)%	6.4 %	(0.0)%	6.4 %	#DIV/0!
CAGR		9.9 %	8.1 %	0.6 %	2.0 %			
EBT	446,798	794,701	562,950	373,519	133,618			
% Revenue	14.5 %	23.5 %	15.7 %	11.9 %	4.0 %	10.5 %	11.9 %	(0.06)
% EBT						#DIV/0!	#NUM!	#DIV/0!
YOY		77.9 %	(29.2)%	(33.6)%	(64.2)%	(42.3)%	(33.6)%	(0.18)
CAGR		77.9 %	12.2 %	(5.8)%	(26.0)%			
Lithium	1,308,153	1,228,171	1,358,170	1,144,778	1,363,284			
% Revenue	42.6 %	36.4 %	37.8 %	36.6 %	41.0 %	38.5 %	37.8 %	0.02
% EBT	292.8 %	154.5 %	241.3 %	306.5 %	1020.3 %	522.7 %	306.5 %	3.90
YOY		(6.1)%	10.6 %	(15.7)%	19.1 %	4.7 %	10.6 %	0.04
CAGR		(6.1)%	1.9 %	(4.3)%	1.0 %			
Bromine	855,143	917,880	1,004,216	964,962	1,128,343			
% Revenue	27.8 %	27.2 %	28.0 %	30.8 %	33.9 %	30.9 %	30.8 %	0.03
% EBT	191.4 %	115.5 %	178.4 %	258.3 %	844.5 %	427.1 %	258.3 %	3.33
YOY		7.3 %	9.4 %	(3.9)%	16.9 %	7.5 %	9.4 %	0.04
CAGR		7.3 %	8.4 %	4.1 %	7.2 %			
Catalysts	778,304	1,101,554	1,061,817	797,914	761,235			
% Revenue	25.3 %	32.6 %	29.6 %	25.5 %	22.9 %	26.0 %	25.5 %	(0.03)
% EBT	174.2 %	138.6 %	188.6 %	213.6 %	569.7 %	324.0 %	213.6 %	1.91
YOY		41.5 %	(3.6)%	(24.9)%	(4.6)%	(11.0)%	(4.6)%	(0.00)
CAGR		41.5 %	16.8 %	0.8 %	(0.6)%			



Period	Years	Beta	Correlation	RSQ	Observations
Monthly	1	1.60	58.8 %		12
Monthly	2	1.91	63.7 %	40.6 %	24
Monthly	3	1.64	62.9 %	39.6 %	36
Monthly	4	1.61	62.6 %	39.2 %	48
Monthly	5	1.60	62.5 %	39.1 %	60
Weekly	1	1.67	62.0 %	38.4 %	52
Weekly	2	1.64	56.7 %	32.1 %	104
Weekly	3	1.54	65.1 %	42.3 %	156
Weekly	4	1.53	64.3 %	41.3 %	208
Weekly	5	1.46	61.5 %	37.8 %	260
Daily	1	1.38	61.1 %	37.4 %	252
Daily	2	1.42	55.4 %	30.6 %	504
Daily	3	1.30	60.0 %	36.0 %	756
Daily	4	1.31	59.4 %	35.3 %	1,008
Daily	5	1.28	58.1 %	33.8 %	1,260



ALB

Company Name

DCF Growth Rates

Period Ending:	2017A	2018A	2019A	2020A	2021A	3-Year Calculations		
						Mean	Median	Slope
x Income Statement:								
Net sales	3,071,976	3,374,950	3,589,427	3,128,909	3,327,957			
YOY		9.9 %	6.4 %	(12.8)%	6.4 %	(0.0)%	6.4 %	(130,735.00)
CAGR		9.9 %	8.1 %	0.6 %	2.0 %			
Cost of goods sold	1,965,700	2,157,694	2,331,649	2,134,056	2,329,986			
% Revenue	64.0 %	63.9 %	65.0 %	68.2 %	70.0 %	67.7 %	68.2 %	0.03
YOY		9.8 %	8.1 %	(8.5)%	9.2 %	2.9 %	8.1 %	0.01
CAGR		9.8 %	8.9 %	2.8 %	4.3 %			
EBT	446,798	794,701	562,950	373,519	133,618			
% Revenue	14.5 %	23.5 %	15.7 %	11.9 %	4.0 %	10.5 %	11.9 %	(0.06)
% EBT	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	-
YOY		77.9 %	(29.2)%	(33.6)%	(64.2)%	(42.3)%	(33.6)%	(0.18)
CAGR		77.9 %	12.2 %	(5.8)%	(26.0)%			
Gross profit	1,106,276	1,217,256	1,257,778	994,853	997,971			
% Revenue	36.0 %	36.1 %	35.0 %	31.8 %	30.0 %	32.3 %	31.8 %	(0.03)
% EBT	247.6 %	153.2 %	223.4 %	266.3 %	746.9 %	412.2 %	266.3 %	2.62
YOY		10.0 %	3.3 %	(20.9)%	0.3 %	(5.8)%	0.3 %	(0.02)
CAGR		10.0 %	6.6 %	(3.5)%	(2.5)%			
Selling, general and administrative expenses	450,286	446,090	533,368	429,827	441,482			
% Revenue	14.7 %	13.2 %	14.9 %	13.7 %	13.3 %	14.0 %	13.7 %	(0.01)
% EBT	100.8 %	56.1 %	94.7 %	115.1 %	330.4 %	180.1 %	115.1 %	1.18
YOY		(0.9)%	19.6 %	(19.4)%	2.7 %	1.0 %	2.7 %	(0.08)
CAGR		(0.9)%	8.8 %	(1.5)%	(0.5)%			
Research and development expenses	84,330	70,054	58,287	59,214	54,026			
% Revenue	2.7 %	2.1 %	1.6 %	1.9 %	1.6 %	1.7 %	1.6 %	(0.00)
% EBT	18.9 %	8.8 %	10.4 %	15.9 %	40.4 %	22.2 %	15.9 %	0.15
YOY		(16.9)%	(16.8)%	1.6 %	(8.8)%	(8.0)%	(8.8)%	0.04
CAGR		(16.9)%	(16.9)%	(11.1)%	(10.5)%			
Gain on sale of business	-	(210,428)	-	-	(295,971)			
% Revenue	0.0 %	(6.2)%	0.0 %	0.0 %	(8.9)%	(3.0)%	0.0 %	(0.04)
% EBT	0.0 %	(26.5)%	0.0 %	0.0 %	(221.5)%	(73.8)%	0.0 %	(1.11)
YOY		Negative	Negative	#DIV/0!	Negative	#DIV/0!	#DIV/0!	#DIV/0!
CAGR		Negative	0.0 %	0.0 %	Negative			
Operating profit	571,660	911,540	666,123	505,812	798,434			
% Revenue	18.6 %	27.0 %	18.6 %	16.2 %	24.0 %	19.6 %	18.6 %	0.03
% EBT	127.9 %	114.7 %	118.3 %	135.4 %	597.5 %	283.8 %	135.4 %	2.40
YOY		59.5 %	(26.9)%	(24.1)%	57.9 %	2.3 %	(24.1)%	0.42
CAGR		59.5 %	7.9 %	(4.0)%	8.7 %			
EBIT	562,148	847,106	620,645	446,635	195,094			
% Revenue	18.3 %	25.1 %	17.3 %	14.3 %	5.9 %	12.5 %	14.3 %	(0.06)
% EBT	125.8 %	106.6 %	110.2 %	119.6 %	146.0 %	125.3 %	119.6 %	0.18
YOY		50.7 %	(26.7)%	(28.0)%	(56.3)%	(37.0)%	(28.0)%	(0.15)
CAGR		50.7 %	5.1 %	(7.4)%	(23.2)%			
Interest and financing expenses	(115,350)	(52,405)	(57,695)	(73,116)	(61,476)			
% Revenue	(3.8)%	(1.6)%	(1.6)%	(2.3)%	(1.8)%	(1.9)%	(1.8)%	(0.00)
% EBT	(25.8)%	(6.6)%	(10.2)%	(19.6)%	(46.0)%	(25.3)%	(19.6)%	(0.18)
YOY		Negative	Negative	Negative	Negative	#DIV/0!	#NUM!	#DIV/0!
CAGR		(54.6)%	(29.3)%	(14.1)%	(14.6)%			



ALB

Company Name

DCF Growth Rates

Period Ending:	2017A	2018A	2019A	2020A	2021A	3-Year Calculations		
						Mean	Median	Slope
Other expenses, net	(9,512)	(64,434)	(45,478)	(59,177)	(603,340)			
% Revenue	(0.3)%	(1.9)%	(1.3)%	(1.9)%	(18.1)%	(7.1)%	(1.9)%	(0.08)
% EBT	(2.1)%	(8.1)%	(8.1)%	(15.8)%	(451.5)%	(158.5)%	(15.8)%	(2.22)
YOY		Negative	Negative	Negative	Negative	#DIV/0!	#NUM!	#DIV/0!
CAGR		577.4 %	118.7 %	83.9 %	182.2 %			
Effective Tax Rate	0.966	0.182	0.157	0.146	0.220			
% Revenue	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.00
% EBT	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.00
YOY		(81.1)%	(14.1)%	(7.0)%	51.2 %	10.1 %	(7.0)%	0.33
CAGR		(81.1)%	(59.7)%	(46.8)%	(30.9)%			
Income tax expense	431,817	144,826	88,161	54,425	29,446			
% Revenue	14.1 %	4.3 %	2.5 %	1.7 %	0.9 %	1.7 %	1.7 %	(0.01)
% EBT	96.6 %	18.2 %	15.7 %	14.6 %	22.0 %	17.4 %	15.7 %	0.03
YOY		(66.5)%	(39.1)%	(38.3)%	(45.9)%	(41.1)%	(39.1)%	(0.03)
CAGR		(66.5)%	(54.8)%	(49.9)%	(48.9)%			
Income before equity in net income	14,981	649,875	474,789	319,094	104,172			
% Revenue	0.5 %	19.3 %	13.2 %	10.2 %	3.1 %	8.9 %	10.2 %	(0.05)
% EBT	3.4 %	81.8 %	84.3 %	85.4 %	78.0 %	82.6 %	84.3 %	(0.03)
YOY		4238.0 %	(26.9)%	(32.8)%	(67.4)%	(42.4)%	(32.8)%	(0.20)
CAGR		4238.0 %	463.0 %	177.2 %	62.4 %			
Equity in net income of unconsolidated subsidiaries	84,487	89,264	129,568	127,521	95,770			
% Revenue	2.8 %	2.6 %	3.6 %	4.1 %	2.9 %	3.5 %	3.6 %	(0.00)
% EBT	18.9 %	11.2 %	23.0 %	34.1 %	71.7 %	42.9 %	34.1 %	0.24
YOY		5.7 %	45.2 %	(1.6)%	(24.9)%	6.2 %	(1.6)%	(0.35)
CAGR		5.7 %	23.8 %	14.7 %	3.2 %			
Net income	99,468	739,139	604,357	446,615	199,942			
% Revenue	3.2 %	21.9 %	16.8 %	14.3 %	6.0 %	12.4 %	14.3 %	(0.05)
% EBT	22.3 %	93.0 %	107.4 %	119.6 %	149.6 %	125.5 %	119.6 %	0.21
YOY		643.1 %	(18.2)%	(26.1)%	(55.2)%	(33.2)%	(26.1)%	(0.18)
CAGR		643.1 %	146.5 %	65.0 %	19.1 %			
Net income attributable to noncontrolling interests	(44,618)	(45,577)	(71,129)	(70,851)	(76,270)			
% Revenue	(1.5)%	(1.4)%	(2.0)%	(2.3)%	(2.3)%	(2.2)%	(2.3)%	(0.00)
% EBT	(10.0)%	(5.7)%	(12.6)%	(19.0)%	(57.1)%	(29.6)%	(19.0)%	(0.22)
YOY		Negative	Negative	Negative	Negative	#DIV/0!	#NUM!	#DIV/0!
CAGR		2.1 %	26.3 %	16.7 %	14.3 %			
Net income attributable to Albemarle Corporation	54,850	693,562	533,228	375,764	123,672			
% Revenue	1.8 %	20.6 %	14.9 %	12.0 %	3.7 %	10.2 %	12.0 %	(0.06)
% EBT	12.3 %	87.3 %	94.7 %	100.6 %	92.6 %	96.0 %	94.7 %	(0.01)
YOY		1164.5 %	(23.1)%	(29.5)%	(67.1)%	(39.9)%	(29.5)%	(0.22)
CAGR		1164.5 %	211.8 %	89.9 %	22.5 %			
Statement of Cashflows								
Depreciation and amortization	196,928	200,698	213,484	231,984	254,000			
% Revenue	6.4 %	5.9 %	5.9 %	7.4 %	7.6 %	7.0 %	7.4 %	0.01
% PP&E	4.8 %					#DIV/0!	#NUM!	#DIV/0!
YOY		1.9 %	6.4 %	8.7 %	9.5 %	8.2 %	8.7 %	0.02
CAGR		1.9 %	4.1 %	5.6 %	6.6 %			
Capital expenditures	(317,703)	(699,991)	(851,796)	(850,477)	(953,667)			
% Revenue	(10.3)%	(20.7)%	(23.7)%	(27.2)%	(28.7)%	(26.5)%	(27.2)%	(0.02)
YOY		120.3 %	21.7 %	(0.2)%	12.1 %	11.2 %	12.1 %	(0.05)
CAGR		120.3 %	63.7 %	38.9 %	31.6 %			



Balance Sheet:

Total current assets	2,477,563	1,998,421	2,225,109	2,206,184	2,007,981			
% Revenue	80.7 %	59.2 %	62.0 %	70.5 %	60.3 %	64.3 %	62.0 %	(0.01)
YOY		(19.3)%	11.3 %	(0.9)%	(9.0)%	0.5 %	(0.9)%	(0.10)
CAGR		(19.3)%	(5.2)%	(3.8)%	(5.1)%			
Cash and cash equivalents	1,137,303	555,320	613,110	746,724	439,272			
% Revenue	37.0 %	16.5 %	17.1 %	23.9 %	13.2 %	18.0 %	17.1 %	(0.02)
% Total current assets	45.9 %	27.8 %	27.6 %	33.8 %	21.9 %	27.8 %	27.6 %	(0.03)
YOY		(51.2)%	10.4 %	21.8 %	(41.2)%	(3.0)%	10.4 %	(0.26)
CAGR		(51.2)%	(26.6)%	(13.1)%	(21.2)%			
Total current liabilities	1,200,925	1,183,173	1,408,996	1,801,849	1,874,335			
% Revenue	39.1 %	35.1 %	39.3 %	57.6 %	56.3 %	51.1 %	56.3 %	0.09
YOY		(1.5)%	19.1 %	27.9 %	4.0 %	17.0 %	19.1 %	(0.08)
CAGR		(1.5)%	8.3 %	14.5 %	11.8 %			
Current portion of long-term debt	422,012	307,294	187,336	804,677	389,920			
% Revenue	13.7 %	9.1 %	5.2 %	25.7 %	11.7 %	14.2 %	11.7 %	0.03
% Total current liabilities	35.1 %	26.0 %	13.3 %	44.7 %	20.8 %	26.3 %	20.8 %	0.04
YOY		(27.2)%	(39.0)%	329.5 %	(51.5)%	79.7 %	(39.0)%	(0.06)
CAGR		(27.2)%	(33.4)%	24.0 %	(2.0)%			



ALB

Company Name

DuPont

DuPont Analysis						
Period Ending	2017A	2018A	2019A	2020A	2021A	
NOPAT Margin	0.6 %	20.5 %	14.6 %	12.2 %	4.6 %	(EBIT*(1-effective tax rate))/Sales
Asset Turnover	0.4 x	0.4 x	0.4 x	0.3 x	0.3 x	Sales/Average Total Assets
Return on Assets	0.2 %	9.0 %	6.0 %	3.8 %	1.4 %	
Debt Burden	5.3 x	1.1 x	1.2 x	1.2 x	1.3 x	Net Income/(EBIT*(1-effective tax rate))
NOPAT Margin	0.6 %	20.5 %	14.6 %	12.2 %	4.6 %	(EBIT*(1-effective tax rate))/Sales
Asset Turnover	0.4 x	0.4 x	0.4 x	0.3 x	0.3 x	Sales/Average Total Assets
Leverage Ratio	2.0 x	2.0 x	2.1 x	2.3 x	1.8 x	Average Total Assets/Equity
Return on Equity	2.6 %	19.7 %	14.8 %	10.0 %	3.4 %	
NOPAT	18,849	692,730	523,449	381,556	152,100	EBIT*(1-effective tax rate)
Average Total Capitalization	2,616,528	2,578,512	3,478,251	3,617,988	3,904,963	Average(Long-Term Debt+Equity)
Return on Capital	0.7 %	26.9 %	15.0 %	10.5 %	3.9 %	

Profitability Ratios						
Period Ending	2017A	2018A	2019A	2020A	2021A	
Gross Margin	36.0 %	36.1 %	35.0 %	31.8 %	30.0 %	Gross Profit/Sales
Operating Margin	18.6 %	27.0 %	18.6 %	16.2 %	24.0 %	Operating Income/Sales
Profit Margin	3.2 %	21.9 %	16.8 %	14.3 %	6.0 %	Net Income/ Sales
Operating Costs to Sales	81.4 %	73.0 %	81.4 %	83.8 %	76.0 %	Operating Costs/Sales
Effective Tax Rate	96.6 %	18.2 %	15.7 %	14.6 %	22.0 %	Provision for Income Tax/EBT

Leverage Ratios						
Period Ending	2017A	2018A	2019A	2020A	2021A	
Debt to Total Assets	0.2 x	0.2 x	0.1 x	0.2 x	0.2 x	Total Liabilities/Total Assets
Total Debt to Equity	0.4 x	0.4 x	0.7 x	0.6 x	0.3 x	Total Debt/Equity
LT Debt to Equity	0.4 x	0.4 x	0.7 x	0.6 x	0.3 x	LT Debt/Equity
Times Interest Earned (TIE)	(5.0)x	(17.4)x	(11.5)x	(6.9)x	(13.0)x	Operating Income/Interest Expense
Degree of Operating Leverage	0.0 x	118.1 x	(3.6)x	2.3 x	(10.5)x	% change in profits/% change in sales

Liquidity Ratios						
Period Ending	2017A	2018A	2019A	2020A	2021A	
Current Ratio	2.1 x	1.7 x	1.6 x	1.2 x	1.1 x	Current Assets/Current Liabilities
Acid Test/Quick Ratio	1.6 x	1.1 x	1.0 x	0.8 x	0.6 x	(Current Assets-Inventory)/Current Liabilities
Net Working Capital to Sales	0.4 x	0.2 x	0.2 x	0.1 x	0.0 x	(Current Assets-Current Liabilities)/Sales
Payout Ratio	261.2 %	20.9 %	29.2 %	43.6 %	145.8 %	DPS/EPS
Plowback/Retention Ratio	(161.2)%	79.1 %	70.8 %	56.4 %	(45.8)%	1-Payout Ratio
Sustainable Growth Rate	(4.2)%	15.5 %	10.4 %	5.6 %	(1.6)%	ROE * Plowback Ratio
EVA						NOPAT - (Cost of Capital * Total Capitalization)
Accounts Receivable Turnover	5.4 x	5.0 x	5.0 x	5.6 x	5.1 x	Sales/Average Accounts Receivable
Average Daily Sales	8416.4 x	9246.4 x	9834.0 x	8572.4 x	9117.7 x	Sales/365
Days' Sales Outstanding (DSO)	68.0 x	66.5 x	68.0 x	74.3 x	66.7 x	Average Accounts Receivable/ Average Daily Sales
Inventory Turnover	5.2 x	4.8 x	4.6 x	4.7 x	4.0 x	Sales/Average Total Inventory
Days' Inventory Outstanding (DIO)	70.4 x	76.8 x	79.5 x	77.2 x	91.2 x	365/Inventory Turnover
Accounts Payable Turnover	4.7 x	4.2 x	3.9 x	4.4 x	3.8 x	COGS/Average Accounts Payable
Days' Payable Outstanding (DPO)	77.7 x	87.4 x	92.8 x	82.8 x	96.7 x	365/Accounts Payable Turnover
Cash Conversion Cycle	60.71	55.98	54.74	68.73	61.11	DIO+DSO-DPO



ALB												
Company Name												
Statement of Operations												
Period Ending:	2017A	2018A	2019A	2020A	2021A	FY2021 Q1	FY2021 Q2	FY2021 Q3	FY2021 Q4	Next Fiscal Year		
										Q1	Q2	Q3
Income Statement (Abstract)												
Net sales	\$ 3,071,976	\$ 3,374,950	\$ 3,589,427	\$ 3,128,909	\$ 3,327,957	\$ 829,291	\$ 773,896	\$ 830,566	\$ 894,204	\$ 1,127,728	\$ 1,479,593	\$ 2,091,805
Cost of goods sold	1,965,700	2,157,694	2,331,649	2,134,056	2,329,986	565,604	525,479	581,293	\$ 657,610	678,698	899,169	1,047,991
Gross profit	1,106,276	1,217,256	1,257,778	994,853	997,971	263,687	248,417	249,273	\$ 236,594	449,030	580,424	1,043,814
Selling, general and administrative expenses	450,286	446,090	533,368	429,827	441,482	93,187	121,516	103,477	\$ 123,302	112,568	128,942	134,479
Research and development expenses	84,330	70,054	58,287	59,214	54,026	14,636	13,976	13,289	\$ 12,125	16,083	17,386	18,358
Gain on sale of business	0	(210,428)	0	0	(295,971)	0	(429,408)	984	\$ 132,453	8,400	0	0
Operating profit	571,660	911,540	666,123	505,812	798,434	155,864	542,333	131,523	\$ (31,286)	311,979	434,096	890,977
Interest and financing expenses	(115,350)	(52,405)	(57,695)	(73,116)	(61,476)	(43,882)	(7,152)	(5,136)	\$ (5,306)	(27,834)	(41,409)	(29,691)
Other expenses, net	(9,512)	(64,434)	(45,478)	(59,177)	(603,340)	11,312	14	(643,196)	\$ 28,530	15,496	8,767	7,974
Income before income taxes and equity in net income of unconsolidated investments	446,798	794,701	562,950	373,519	133,618	123,294	535,195	(516,809)	\$ (8,062)	299,641	401,454	869,260
Income tax expense	431,817	144,826	88,161	54,425	29,446	22,107	106,985	(114,670)	\$ 15,024	80,530	89,018	196,938
Income before equity in net income of unconsolidated investments	14,981	649,875	474,789	319,094	104,172	101,187	428,210	(402,139)	\$ (23,086)	219,111	312,436	672,322
Equity in net income of unconsolidated investments (net of tax)	84,487	89,264	129,568	127,521	95,770	16,511	17,998	27,706	\$ 33,555	62,436	128,156	258,884
Net income	99,468	739,139	604,357	446,615	199,942	117,698	446,208	(374,433)	\$ 10,469	281,547	440,592	931,206
Net income attributable to noncontrolling interests	(44,618)	(45,577)	(71,129)	(70,851)	(76,270)	(22,021)	(21,608)	(18,348)	\$ (14,293)	(28,164)	(33,819)	(33,991)
Net income attributable to Albemarle Corporation	\$ 54,850	\$ 693,562	\$ 533,228	\$ 375,764	\$ 123,672	\$ 95,677	\$ 424,600	\$ (392,781)	\$ (3,824)	\$ 253,383	\$ 406,773	\$ 897,215
Basic earnings per share (in dollars per share)	\$ 0.49	\$ 6.40	\$ 5.03	\$ 3.53	\$ 1.07	\$ 0.85	\$ 3.63	\$ (3.36)	\$ (0)	\$ 2.16	\$ 3.47	\$ 7.66
Diluted earnings per share (in dollars per share)	\$ 0.49	\$ 6.34	\$ 5.02	\$ 3.52	\$ 1.06	\$ 0.84	\$ 3.62	\$ (3.36)	\$ (0)	\$ 2.15	\$ 3.46	\$ 7.61
Weighted-average common shares outstanding—basic (in shares)	110,914	108,427	105,949	106,402	115,841	112,592	116,809	116,965	115,841	117,066	117,116	117,136
Weighted-average common shares outstanding—diluted (in shares)	112,380	109,458	106,321	106,808	116,536	113,330	117,346	116,965	116,536	117,653	117,724	117,869
Cash dividends declared (in dollars per share)	\$ 1.28	\$ 1.34	\$ 1.47	\$ 1.54	\$ 1.56	\$ 0.39	\$ 0.39	\$ 0.39	\$ 0.39	\$ 0.40	\$ 0.40	\$ 0.40

ALB												
Company Name												
Balance Sheet												
Period Ending:	2017A	2018A	2019A	2020A	2021A	FY2021 Q1	FY2021 Q2	FY2021 Q3	FY2021 Q4	Next Fiscal Year		
										Q1	Q2	Q3
Current assets:												
Cash and cash equivalents	\$ 1,137,303	\$ 555,320	\$ 613,110	\$ 746,724	\$ 439,272	\$ 569,859	\$ 823,572	\$ 595,049	\$ 439,272	\$ 463,325	\$ 930,596	\$ 1,382,803
Trade accounts receivable, less allowance for doubtful accounts (2021—\$2,559; 2020—\$2,083)	534,326	605,712	612,651	530,838	556,922	532,964	455,222	520,746	556,922	658,733	962,215	1,035,117
Other accounts receivable	37,937	52,059	67,551	61,958	66,184	60,558	58,256	56,298	66,184	71,225	124,409	135,709
Inventories	592,781	700,540	768,984	750,237	812,920	685,779	732,563	745,598	812,920	1,013,793	1,216,213	1,614,299
Other current assets	136,064	84,790	162,813	116,427	132,683	93,844	81,741	160,415	132,683	129,407	116,671	129,043
Assets held for sale	39,152	0	0	0	0	66,390	0	0	0	0	0	0
Total current assets	2,477,563	1,998,421	2,225,109	2,206,184	2,007,981	2,009,394	2,151,354	2,078,106	2,007,981	2,336,483	3,350,104	4,296,971
Property, plant and equipment, at cost	4,124,335	4,799,063	6,817,843	7,427,641	8,074,746	7,433,593	7,596,684	7,783,962	8,074,746	8,238,317	8,465,403	8,713,771
Less accumulated depreciation and amortization	1,631,025	1,777,979	1,908,370	2,073,016	2,165,130	2,043,264	2,086,085	2,128,485	2,165,130	2,209,664	2,257,379	2,288,664
Net property, plant and equipment	2,493,310	3,021,084	4,909,473	5,354,625	5,909,616	5,390,329	5,510,599	5,655,477	5,909,616	6,028,653	6,208,024	6,425,107
Investments	534,064	528,722	579,813	656,244	897,708	663,448	907,080	902,504	897,708	937,619	903,861	1,158,535
Noncurrent assets held for sale	139,813	0	0	0	0	50,683	0	0	0	0	0	0
Other assets	74,164	80,135	213,061	219,268	252,239	212,258	256,081	251,786	252,239	240,279	230,346	217,057
Goodwill	1,610,355	1,567,169	1,578,785	1,665,520	1,597,627	1,629,169	1,640,720	1,623,471	1,597,627	1,575,617	1,542,767	1,467,848
Other intangibles, net of amortization	421,503	386,143	354,622	349,105	308,947	335,021	331,092	320,981	308,947	297,407	285,303	262,984
Total assets	7,750,772	7,581,674	9,860,863	10,450,946	10,974,118	10,290,302	10,796,926	10,832,325	10,974,118	11,416,058	12,520,405	13,828,502
Current liabilities:												
Accounts payable	418,537	522,516	574,138	483,221	647,986	492,532	535,153	545,922	647,986	845,710	1,091,583	1,651,866
Accrued expenses	268,336	257,323	576,297	440,763	763,293	378,973	317,954	956,506	763,293	667,610	330,941	385,327
Current portion of long-term debt	422,012	307,294	187,336	804,677	389,920	616	623	611	389,920	503,795	251,304	251,216
Dividends payable	35,165	35,169	38,764	40,937	45,469	45,327	45,428	45,450	45,469	46,091	46,097	46,098
Liabilities held for sale	1,938	0	0	0	0	4,068	0	0	0	0	0	0
Income taxes payable	54,937	60,871	32,461	32,251	27,667	31,740	85,770	42,553	27,667	40,132	61,837	153,444
Total current liabilities	1,200,925	1,183,173	1,408,996	1,801,849	1,874,335	953,256	984,928	1,591,042	1,874,335	2,103,338	1,781,762	2,487,951
Long-term debt	1,415,360	1,397,916	2,862,921	2,767,381	2,004,319	2,030,032	2,043,794	2,021,487	2,004,319	1,985,696	3,205,730	3,118,753
Postretirement benefits	52,003	46,157	50,899	48,075	43,693	47,817	47,371	47,020	43,693	43,397	43,079	42,681
Pension benefits	294,611	285,396	292,073	340,818	229,187	316,652	309,712	299,875	229,187	217,820	205,890	187,498
Noncurrent liabilities held for sale	614	0	0	0	0	0	0	0	0	0	0	0
Other noncurrent liabilities	599,174	526,942	754,536	629,377	663,698	619,309	616,912	617,488	663,698	649,878	591,021	597,980
Deferred income taxes	370,389	382,982	397,858	394,852	353,279	380,683	428,438	360,181	353,279	380,877	391,948	429,012
Commitments and contingencies												
Common Stock, Shares, Issued	110,547	105,616	106,040	106,842	117,015	116,718	116,945	116,976	117,015	117,112	117,122	117,145
Common Stock, Shares Authorized	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Common stock, par value (in dollars per share)	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01	\$ 0.01
Albemarle Corporation shareholders' equity:												
Common stock, \$0.1 par value (authorized 150,000 shares), issued and outstanding — 117,015 in 2021 and 106,842 in 2020	1,105	1,056	\$ 1,061	\$ 1,069	\$ 1,170	1,167	1,169	1,170	\$ 1,170	1,171	1,171	1,171
Additional paid-in capital	1,863,949	1,368,897	1,383,446	1,438,038	2,920,007	2,889,923	2,907,981	2,913,383	2,920,007	2,915,387	2,927,086	2,933,659
Accumulated other comprehensive loss	(225,668)	(350,682)	(395,735)	(326,132)	(392,450)	(350,114)	(328,001)	(366,436)	(392,450)	(393,619)	(507,138)	(717,309)
Retained earnings	2,035,163	2,566,050	2,943,478	3,155,252	3,096,539	3,205,408	3,584,400	3,145,999	3,096,539	3,303,661	3,664,172	4,515,115
Total Albemarle Corporation shareholders' equity	3,674,549	3,585,321	3,932,250	4,268,227	5,625,266	5,746,384	6,165,549	5,694,116	5,625,266	5,826,600	6,085,291	6,732,636
Noncontrolling interests	143,147	173,787	161,330	200,367	180,341	196,169	200,222	201,116	180,341	208,452	215,684	231,991
Total equity	3,817,696	3,759,108	4,093,580	4,468,594	5,805,607	5,942,553	6,365,771	5,895,232	5,805,607	6,035,052	6,300,975	6,964,627
Total liabilities and equity	\$ 7,750,772	\$ 7,581,674	\$ 9,860,863	\$ 10,450,946	\$ 10,974,118	\$ 10,290,302	\$ 10,796,926	\$ 10,832,325	\$ 10,974,118	\$ 11,416,058	\$ 12,520,405	\$ 13,828,502



ALB

Company Name

Statement of Cash Flows

Period Ending:

Statement of Cash Flows [Abstract]

	2017A	2018A	2019A	2020A	2021A
Cash and cash equivalents at beginning of year	\$ 2,269,756	\$ 1,137,303	\$ 555,320	\$ 613,110	\$ 746,724
Cash flows from operating activities:					
Net income	99,468	739,139	604,357	446,615	199,942
Adjustments to reconcile net income to cash flows from operating activities:					
Depreciation and amortization	196,928	200,698	213,484	231,984	254,000
Gain on sale of business/interest in properties, net	(6,221)	0	0	(7,168)	(295,971)
Gain on sale of business	0	(210,428)	0	0	0
Gain on sale of property	0	0	(14,411)	0	0
Stock-based compensation and other	19,404	15,228	19,680	22,837	20,120
Equity in net income of unconsolidated investments (net of tax)	(84,487)	(89,264)	(129,568)	(127,521)	(95,770)
Dividends received from unconsolidated investments and nonmarketable securities	39,386	57,415	71,746	88,161	78,391
Pension and postretirement (benefit) expense	(12,436)	10,410	31,515	45,658	(74,010)
Pension and postretirement contributions	(13,341)	(15,236)	(16,478)	(16,434)	(30,253)
Unrealized gain on investments in marketable securities	(3,135)	(527)	(2,809)	(4,635)	(3,818)
Loss on early extinguishment of debt	52,801	0	4,829	0	28,955
Deferred income taxes	(41,941)	49,164	14,394	(1,976)	(38,500)
Changes in current assets and liabilities, net of effects of acquisitions and divestitures:					
(Increase) decrease in accounts receivable	(74,545)	(97,448)	(18,220)	100,118	(49,295)
(Increase) decrease in inventories	(101,545)	(124,067)	(46,304)	51,978	(127,401)
Decrease (increase) in other current assets	(213)	(2,181)	(32,941)	7,902	17,411
Increase (decrease) in accounts payable	53,421	73,730	(12,234)	(31,519)	143,939
Increase (decrease) in accrued expenses and income taxes payable	(269,381)	(1,999)	(4,640)	(215,011)	127,068
Non-cash transfer of 40% value of construction in progress of Kemerton plant to MRL			164,496	179,437	135,928
Other, net	449,816	(58,469)	(127,522)	28,488	53,521
Net cash provided by operating activities	303,979	546,165	719,374	798,914	344,257
Cash flows from investing activities:					
Acquisitions, net of cash acquired	(44,367)	(11,403)	(820,000)	(22,572)	0
Capital expenditures	(317,703)	(699,991)	(851,796)	(850,477)	(953,667)
Cash proceeds from divestitures, net	6,857	413,569	0	0	289,791
Proceeds from sale of joint venture	0	0	0	11,000	0
Proceeds from sale of property and equipment	0	0	10,356	0	0
Sales of marketable securities, net	(275)	(270)	384	903	3,774
Repayments from joint ventures	1,250	0	0	0	0
Investments in equity and other corporate investments	(3,565)	(5,600)	(2,569)	(2,427)	(6,488)
Net cash used in investing activities	(357,803)	(303,695)	(1,663,625)	(863,573)	(666,590)
Cash flows from financing activities:					
Proceeds from issuance of common stock	0	0	0	0	1,453,888
Proceeds from borrowings of other long-term debt	27,000	0	1,597,807	452,163	0
Repayments of long-term debt and credit agreements	(778,209)	0	(175,215)	(250,000)	(1,173,823)
Other borrowings (repayments), net	138,751	(113,567)	(126,364)	137,635	60,991
Fees related to early extinguishment of debt	(46,959)	0	(4,419)	0	(24,877)
Dividends paid to shareholders	(140,557)	(144,596)	(152,204)	(161,818)	(177,853)
Dividends paid to noncontrolling interests	(36,756)	(14,756)	(83,187)	(32,061)	(96,136)
Repurchases of common stock	(250,000)	(500,000)	0	0	0
Proceeds from exercise of stock options	8,238	3,633	4,814	40,437	18,392
Withholding taxes paid on stock-based compensation award distributions	(8,376)	(17,240)	(11,031)	(5,143)	(8,140)
Other	0	0	(7,514)	(3,952)	(2,230)
Net cash provided by financing activities	(1,086,868)	(786,526)	1,042,687	177,261	50,212
Net effect of foreign exchange on cash and cash equivalents	8,239	(37,927)	(40,646)	21,012	(35,331)
(Decrease) increase in cash and cash equivalents	(1,132,453)	(581,983)	57,790	133,614	(307,452)
Cash and cash equivalents at end of year	\$ 1,137,303	\$ 555,320	\$ 613,110	\$ 746,724	\$ 439,272

