



**promontory**  
investment research



**BorgWarner, Inc.**  
**Occidental Petroleum Corporation**  
**Catalyst Pharmaceuticals, Inc.**  
**How Useful is Sell-Side Equity Research?**  
**Fall 2024 Equity Report**

# Foreword

Promontory Investment Research is proud to present its nineteenth equity research report. This fall, our Research Analysts produced high-quality work across five industry coverage pods and a piloted Portfolio Strategy and Analytics pod covering topics in macroeconomics and investor strategy. Of these six reports, we have selected four to share with you. These reports cover: Occidental Petroleum Corporation, an American upstream oil and gas company; BorgWarner, Inc., a global automotive supplier; Catalyst Pharmaceuticals, Inc., a pharmaceutical company providing three specific rare-disease drugs currently to the American market; and the usefulness of sell-side equity research, which we hope inspires the growth and vision of our future research.

As with all of Promontory's previous equity research publications, we take immense pride in the thoroughness and dedication demonstrated by our Research Analysts this quarter. This report represents the culmination of their hard work, and we hope you find it as insightful and enjoyable to read as they found it rewarding to create.

Alongside our research initiatives, we have continued to foster an environment that reinforces our commitment to a collaborative, diverse, and close-knit community through a variety of mentorship programs, social events, and fireside chats with our alumni.

As this marks the final quarter for the current Board, we would like to conclude this foreword by extending our heartfelt thanks for your continued support and for taking the time to engage with our work. It has been an honor to serve this organization, and we look forward to seeing Promontory reach new heights in the quarters to come.

Promontory Investment Research Board

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# BorgWarner Inc.

BorgWarner, a global automotive supplier, specializes in technology solutions for combustion, hybrid, and electric vehicles, nearly every major automotive OEM in the world. With its aggressive investments in electrification and strategic acquisitions, the company is navigating a challenging market landscape marked by input cost pressures and slower-than-expected EV adoption. Given these headwinds, we maintain a **moderate sell** stance, with concerns about near-term margin compression and integration risks offsetting the longer-term potential of its eProduct portfolio.

## Company Overview

BorgWarner Inc. is an American automotive supplier that designs, manufactures, and sells technology solutions for combustion, hybrid, and electric vehicles to original equipment manufacturers (“OEMs”) of light vehicles, commercial vehicles, and off-highway vehicles. BorgWarner offers two portfolios of products: eProducts and Foundational products. The former includes all products used on or for electric vehicles (“EVs”) and those same products that are also included in hybrid powertrains. The latter includes all products used on internal combustion engines (“ICEs”) plus those same products that are also included in hybrid powertrains. BorgWarner’s products help improve vehicle performance, propulsion efficiency, stability, and air quality.

BorgWarner’s products are manufactured and sold worldwide, with only 16% of net sales generated in the United States. Their largest customers are Ford and Volkswagen, accounting for 14% and 11% of net sales, respectively. Sales to the company’s top ten customers accounts for 68% of net sales.<sup>1</sup> Deliveries to customers are in alignment with OEMs’ just-in-time manufacturing production schedules. New products are researched and developed by BorgWarner working closely with OEMs to best fulfill their product needs.

They compete with their competitors through technological innovation, quality, price, delivery, and program launch support. The firm considers its major non-OEM competitors to be Robert Bosch GmbH; Denso Corporation; Garrett Motion; Hitachi, Ltd.; Magna Powertrain (an operating unit of Magna International Inc.); Valeo; Schaeffler Group; and Vitesco Technologies. The company also competes with some start-ups in electrification.

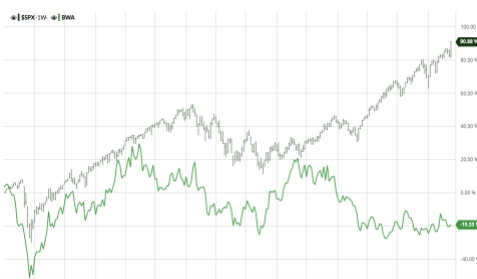
## Company History

Borg-Warner Corporation was formed out of several disparate manufacturers in 1928: Morse Equalizing Spring Company, Borg & Beck, Marvel-Schebler, Long Manufacturing, Warner Gear, and Mechanics Universal Joint. Over the following decades, the company innovated, expanded, and diversified its portfolio, strategically acquiring subsidiaries from all over the world and further expanding foreign operations. BorgWarner, together with its subsidiaries, incorporated as a Delaware corporation in 1987. Between 2006 and 2014, the organization invested in new production facilities, including in South Korea, France, Germany, China, Hungary, Poland, India, Brazil, Portugal, Mexico, and Thailand. Starting in the mid-2010s, BorgWarner Inc. began focusing on adapting to the macro trend towards vehicle electrification, introducing a portfolio of products for new propulsion technologies the company coins “eProducts.” Announced in 2021, *Charging Forward* is the company’s strategy to focus on profitable growing eProducts while maximizing the value of the company’s Foundational products portfolio, to be done through both organic growth and technology-focused acquisitions.

Rating	<b>Sell</b>
Price (11/08/24)	<b>\$33.92</b>
Price Target	<b>\$26.00</b>
52W Range	<b>\$38.23 - \$29.51</b>
Market Cap	<b>\$8.99B</b>
EPS (FY 2024)	<b>\$1.09</b>
Consensus	<b>\$42.75</b>

Ticker	NYSE: BWA		
	2022A	2023E	2024E
<b>Revenue (M)</b>	\$12,635	\$14,198	\$14,823
<b>% Growth</b>	7.04%	12.37%	4.4%
<b>EBIT (M)</b>	\$1,009	\$1,160	\$1,180
<b>% Change</b>	16.15%	23.10%	23.6%
<b>Metric</b>	\$694	\$889	\$688

### Price Performance Chart



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<sup>1</sup> Source: BorgWarner, Inc. 10-K FY2023. All numbers for FY2023.



## Business Segmentation

With 39,900 workers across the Americas, Asia, and Europe as well as 82 Properties spread between the regions, BWA services equipment to many large and medium sized OEM's. Notable customers in FY2023 were Ford and Volkswagen, accounting for 14% and 11% of net sales, respectively. BorgWarner focuses its manufacturing within three segments: Air Management, Drivetrain & Battery Systems, and ePropulsion; which accounted for 55%, 31%, and 15% of net sales in FY2023, respectively

### The Air Management Section

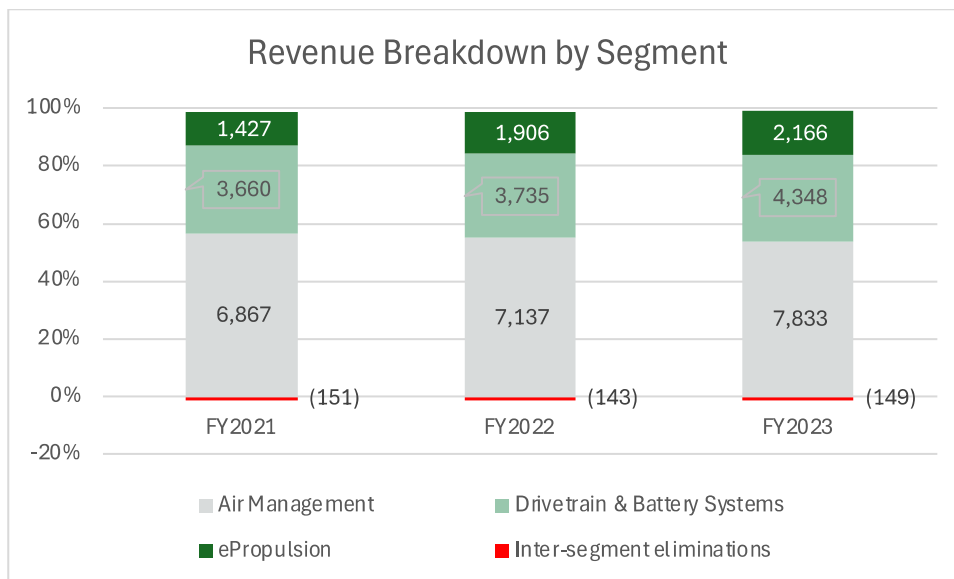
This segment includes technologies such as turbochargers, eBoosters, and emissions systems, which are essential for improving the efficiency of internal combustion engines (ICEs) and hybrid vehicles. Additionally, the segment has expanded into electrification-related technologies, including battery heaters and direct current (DC) charging stations, supporting both thermal management and charging infrastructure for electric vehicles (EVs). These products are crucial for optimizing the performance and longevity of batteries, which can help improve EV range and efficiency. The integration of thermal systems and smart actuators also supports automakers' efforts to meet increasingly stringent fuel efficiency and emissions standards.

### Drivetrain & Battery Systems

The segment includes components vital for optimizing power transfer in vehicles. Control modules enhance transmission efficiency, while mechanical clutches and torque management systems ensure smooth power distribution in rear-wheel and all-wheel-drive setups. This segment also supplies battery modules and lithium-ion systems for heavy-duty applications like buses and trucks, ensuring robust energy storage and performance. Additionally, coupling systems and transfer cases manage efficient power distribution across axles, supporting both passenger and commercial vehicles.

### ePropulsion

Provides critical components for electric powertrains. Inverters, onboard chargers, and DC/DC converters regulate electrical power, while eMotors and generators drive vehicle propulsion. The integrated drive modules (iDMs) combine motors, inverters, and gear systems into compact units to maximize efficiency. Battery management systems monitor battery health, and propulsion controllers optimize power delivery, supporting a range of electric and hybrid vehicles with efficient energy management.



## PHINIA Spin-Off, Recent Acquisitions, and Joint Ventures

The spin-off of PHINIA, coupled with BorgWarner's series of acquisitions and joint ventures, reflects the company's strategic pivot toward electrification and sustainable mobility. While this shift aligns with industry trends and may position BorgWarner to capture growth in the EV market, it also comes with heightened execution risks and financial uncertainties. The divestiture of its Fuel Systems and Aftermarket segments frees up resources, but it simultaneously reduces diversification, increasing the company's dependence on the still-maturing EV sector. Acquisitions like AKASOL AG for battery systems and Rhombus Energy Solutions for charging infrastructure, while promising, require significant integration efforts and come with substantial upfront costs. Additionally, the reliance on joint ventures, particularly in volatile markets like China, introduces complexity and potential

exposure to geopolitical and economic risks. The company's consolidated results may show near-term volatility, especially as BorgWarner faces pressure to deliver on synergies from these deals amidst an uncertain macroeconomic environment.

## Industry Overview | Automotive Parts and Equipment

### General Information

Auto parts market estimated to be valued at USD 1,103.4 bn by 2030 at growth of 6.8%

### Value Drivers

#### Efficiency of parts

- As global regulations continue to tighten around vehicle emissions and fuel consumption, automakers are increasingly relying on suppliers to provide components that can help meet these standards. Advanced technologies in areas such as engine management systems, turbochargers, and lightweight materials are playing crucial roles in this effort.
- Moreover, the push for these technologies is reshaping the relationship between OEMs and suppliers. Tier 1 suppliers are increasingly taking on more responsibility for system-level design and integration, becoming critical partners in meeting regulatory requirements.

Examples of regulatory requirements that have been on the rise for years:

- European Union: The EU has set a target for new cars to emit an average of 95g CO<sup>2</sup>/km by 2021, with further reductions planned for 2025 and 2030.
- United States: The Corporate Average Fuel Economy (CAFE) standards require automakers to achieve an average fuel economy of 50.4 mpg for their fleet by 2025.
- China: The world's largest automotive market has implemented China 6 emissions standards, equivalent to Euro 6, and has set aggressive targets for electric vehicle adoption.

#### Strategic Technology Partnerships:

Auto parts suppliers are increasingly looking beyond their traditional boundaries to form partnerships with technology companies, startups, and even companies from other industries:

Diversification of Solutions: By forming partnerships, suppliers can diversify their product lines to include new technologies such as battery management systems, advanced driver-assistance systems (ADAS), and connected vehicle services. This allows companies to reap the benefits of upgrading their systems without the hefty R&D often associated with fabricating these new augments.

BorgWarner and Wolfspeed: 600M investment for a stable supply of silicon carbide semiconductors (for electric vehicle inverters) and better power EV powertrains

Magna International and LG: 2021, Magna partnered to form LG Magna e-Powertrain with focus on electric powertrain systems; aims to supply EV components to major automaker

### Characteristics of OEM Industry

The Original Equipment Manufacturer and auto parts manufacturing industry is a critical component of the broader automotive ecosystem, responsible for supplying the necessary components and systems for vehicle assembly and operation.

#### Asset-Intensive Structure

- Manufacturing Facilities and Equipment: OEMs and auto parts manufacturers typically operate large-scale manufacturing facilities equipped with advanced machinery and technology. This includes production lines for various components, such as engines, transmissions, electrical systems, and body parts, necessitating significant capital investment.
- Supply Chain Infrastructure: The industry relies on a complex supply chain network that includes suppliers of raw materials, sub-components, and logistics providers.

#### Major Cost Drivers

- Raw Material Costs: The cost of raw materials—including metals, plastics, and composites—represents a significant portion of overall production costs. Fluctuations in commodity prices can directly impact profitability and require strategic procurement practices to manage.

- **Labor Costs:** Labor costs encompass not only wages and benefits for skilled manufacturing workers but also ongoing training and development programs to ensure safety and efficiency. The need for specialized skills influences labor expenses and incentivizes development of training programs.
- **R&D:** R&D is crucial for OEMs and parts manufacturers to innovate and remain competitive. This includes developing new technologies, improving manufacturing processes, and meeting evolving consumer preferences.

#### Cyclical Nature

- **Tied to Automotive Sales:** Demand for automotive parts is closely linked to vehicle production volumes, which are cyclical.
- **Economic Sensitivity:** The industry is vulnerable to economic downturns as consumers may delay vehicle purchases during them.
- **Regional Variations:** Different markets may experience different cycles, requiring global diversification.

#### Competitive Landscape



The automotive parts and components market is highly competitive and fragmented, with a mix of large multinational corporations and smaller specialized suppliers. Since cars on average contain 30,000 different parts, companies generally tend to do a combination of either specializing in specific groupings of parts (often accessory/advanced systems) or offer broader choices to fit as a one-stop-shop for customers. However, critical components such as powertrains, transmission, and thermal often are led by larger companies that can offer more stable supply lines in large numbers.

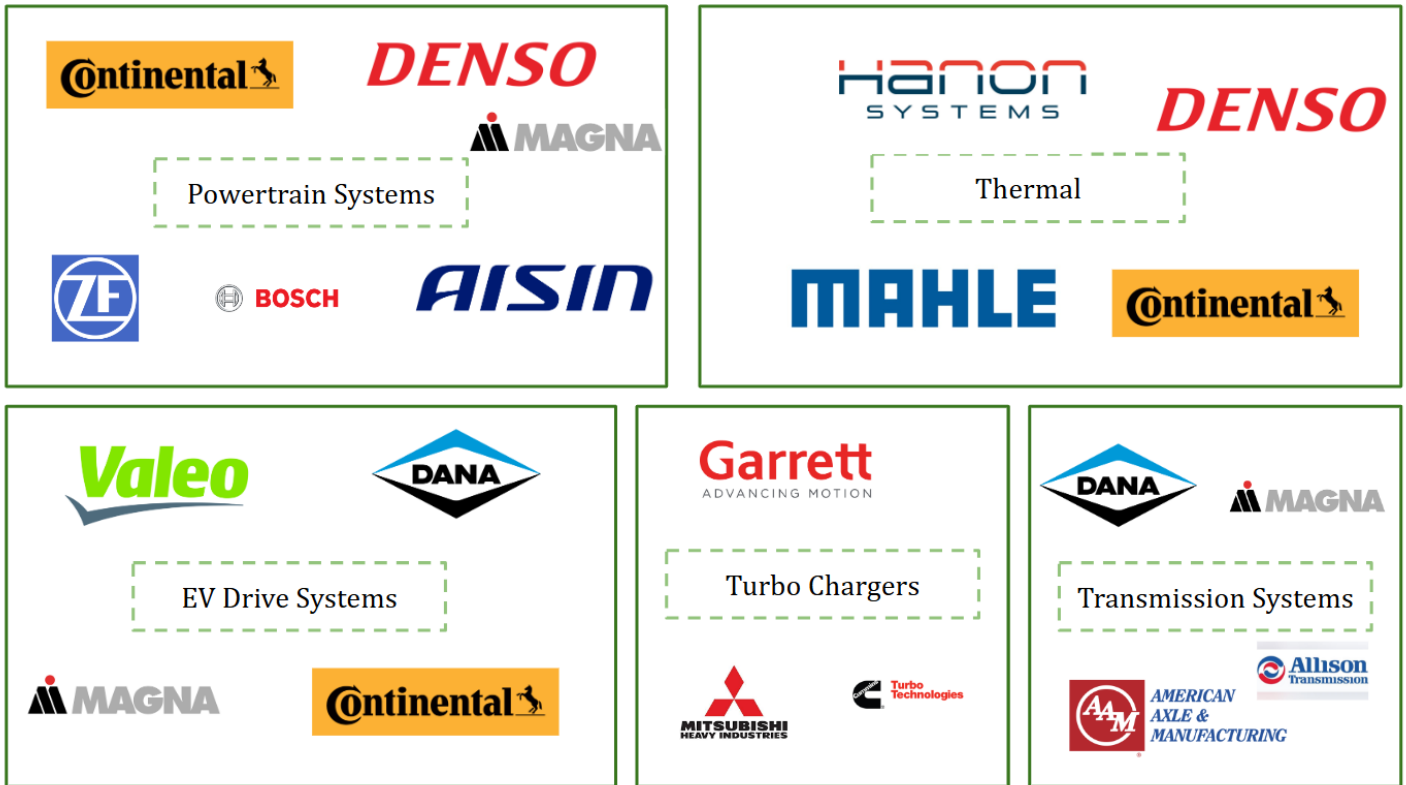
#### Making it into the Next Version

The automotive industry (the customers of auto parts companies) in many countries operate similarly, with a few dominant automakers in each region, making the market somewhat oligopolistic. In major markets like the US, Germany, Japan, and South Korea, a limited number of large automotive companies (e.g., Ford, GM, Stellantis, Volkswagen, Toyota, Hyundai) dominate vehicle production. This concentration means that component suppliers, like BorgWarner, face stiff competition and consumer pressure to have their systems included in new vehicle models, as automakers often maintain established relationships with preferred suppliers.

Globally, the competition among suppliers is intense, as automakers typically work with multiple component manufacturers to source key parts for engines, transmissions, and electric systems. To secure contracts, suppliers must offer technological innovation, cost efficiency, and reliability, especially as automakers look for ways to reduce costs and improve vehicle performance, sustainability, and safety.

#### BorgWarner's Main Competitive Systems & competitors

In assessing BorgWarner's competitive landscape, it's important to recognize that the company faces competition from large, diversified automotive suppliers, each with significant capabilities across various system segments. Key competitors such as Continental AG, Denso, Magna, and Dana Inc are also aggressively innovating, often spanning multiple vehicle subsystems. Additionally, specialized firms in turbocharging, thermal management, and transmission systems (e.g., Garrett Motion and Allison Transmission) pose focused challenges in niche segments.



## Investment Theses

### *Investment Thesis #1: BorgWarner's Electrification Push Bottlenecked by Customer/Geographic Choices*

#### Customer Base Misalignment

At the heart of this misalignment lies BorgWarner's deep reliance on traditional automakers, particularly Ford and Volkswagen, which accounted for 14% and 11% of its 2023 consolidated net sales, respectively. These once-solid relationships have become critical weaknesses in the company's EV transition strategy.

*(The following next 3 clients were based on which vehicle lines/partnerships BorgWarner has as public info on top 5 suppliers in unavailable)*

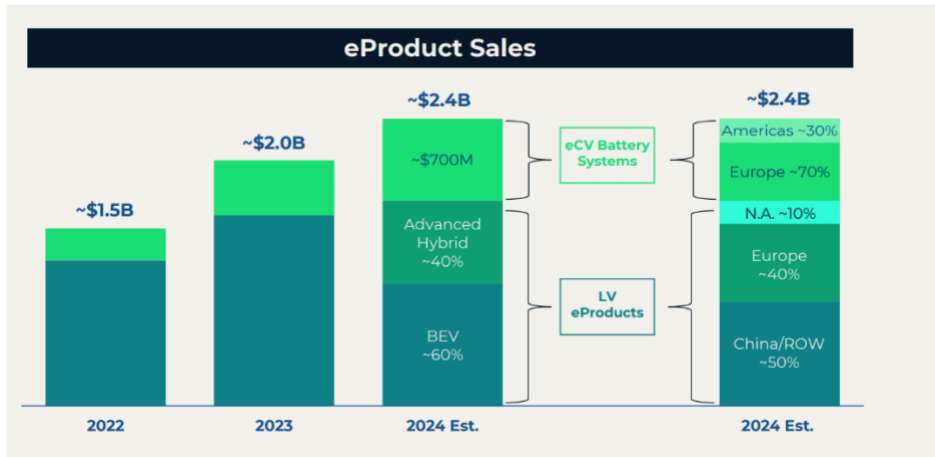
Ford (14% Rev)	Turbochargers, Emission Control Systems	Slashed F-150 Lightning production by 50% for 2024  Total <b>investment reduction of \$12B</b> in EV program
Volkswagen (11% Rev)	Turbochargers, Transmission Components	Volkswagen <b>ID.4 Sales Down 58%</b> in USA
General Motors	Turbochargers, Transmission Systems	Approximately <b>80% of GM's current vehicle sales</b> are still reliant on internal combustion engines (ICEs),
Stellantis	Various Components (unified strategy in EV development)	Stellantis holds only a <b>2% share in the U.S. EV market</b> , limiting growth opportunities for its suppliers.
BYD	Electric Vehicle Components (limited to China)	BYD's strategy is to <b>source most of its EV components domestically</b> , often preferring Chinese suppliers.

The company's strategic decision to follow traditional OEMs into electrification, rather than diversifying its customer base to include more successful EV manufacturers until recently, has left it exposed to either its customers' EV market struggles or in the case of BYD, an unwillingness to use a foreign supplier as their primary source.



## Geographic Exposure

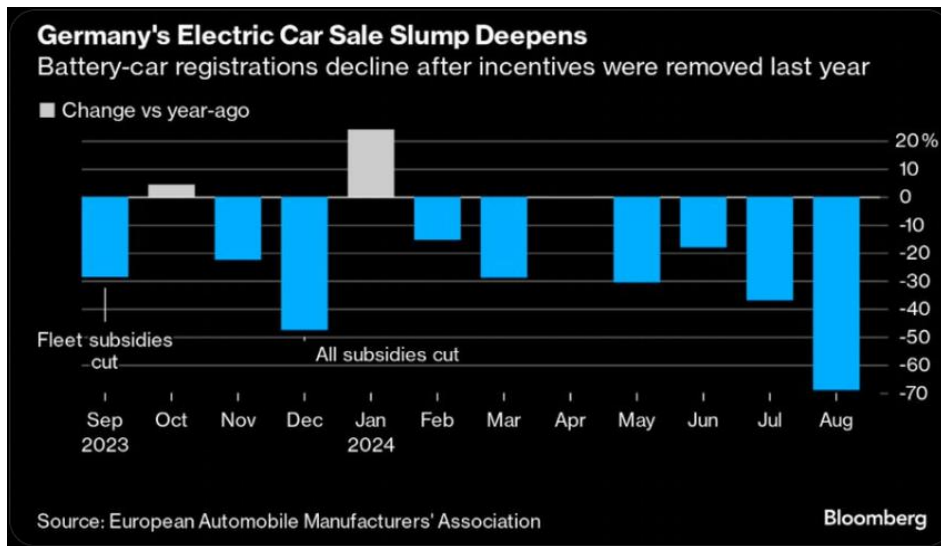
BorgWarner's significant presence in Europe and Asia, which together constitute 86% of its 2023 revenue, presents several challenges:



BorgWarner's highest-invested EV segments—**eCV Battery Systems** and **LV eProducts**—are concentrated in regions facing mounting challenges. With an estimated **\$2.4 billion** in eProduct sales projected for 2024, **70% of eCV Battery System sales and 90% of LV eProducts** sales are anticipated to come from Europe and China/Rest of World (ROW). This geographic concentration introduces significant risks, given the unique economic and competitive pressures in these regions:

### Europe's Slowing EV Market Growth due to incentive cuts:

European EV growth has slowed dramatically, from a 47% increase in 2022 to just 9% in 2023, and further weakening is expected as EV incentives expire across major markets like Germany. This trend is expected to weaken further in 2024 as various EV incentives expire across the continent. The situation with Germany is quite concerning as recent EV incentive cuts caused immediate drops in demand. Volkswagen being a core customer makes this environment even more stagnant for future orders with Borgwarner.



### Chinese Manufacturing Partnership having less of an effect than expected

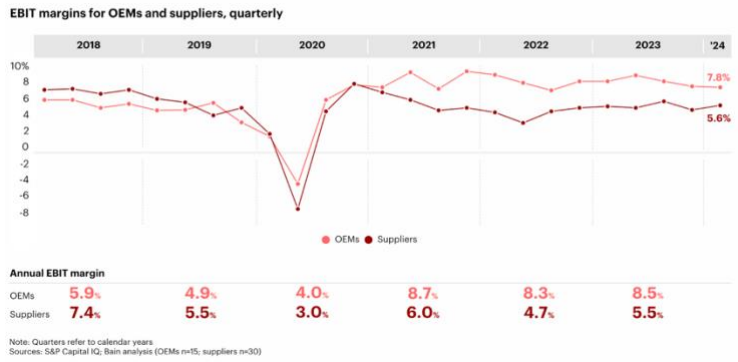
In China, where passenger EV growth is strongest, local players like BYD and CATL dominate and often source components domestically, making it harder for BorgWarner to penetrate this segment even with partnerships. Additionally, some of BorgWarner's recent investments are focused on commercial EV solutions, like high-voltage inverters, potentially indicating a stronger emphasis on this segment (Jan 2024 they entered a joint venture with Shaanxi Fast Auto Drive Group). As a result, BorgWarner is in a segment that may not experience the same accelerated growth as the passenger EV market.

## Investment Thesis #2: Client price pressure and supplier cost pressure hurt overall operational efficiency

### Major client imposing price pressure

The automotive supply industry is experiencing significant pricing pressure from major OEM customers, reversing a two-decade trend where suppliers typically enjoyed higher EBIT margins. Since early 2020, the semiconductor shortage and rising supply chain costs have led OEMs to focus on implementing price increases. In Q1 2024, OEMs reported an average profit margin of 7.8%, compared to just 5.6% for suppliers. These dynamics threaten OEM margins: two-thirds saw margin declines in 2024, which have been exacerbated by persistent higher interest rates and uncertainties surrounding EV adoption. The need for OEMs to produce both ICE and EV platforms, coupled with a heightened emphasis on cost reduction, threatens to negatively impact suppliers' revenue streams. This has been especially significant after 2019 compared to decades before 2019, as volatility increased and margin dynamics significantly shifted after supply chain issues, inflation, and chip shortages.

### Automakers' profit margins remain higher than suppliers'



Recent developments among key manufacturers highlight the seriousness of this pricing pressure. Stellantis has enacted cost-cutting measures following a 20% decline in U.S. sales, while Volkswagen has reported a 7.1% drop in vehicle deliveries this year. Ford quality issues in its EV segment contributed to an operating loss of \$1.1 billion given \$800M of incurred expenses, following a \$1.3 billion loss in Q1. European manufacturers such as Volkswagen, BMW, Mercedes-Benz, and Stellantis, have lowered their full-year profitability guidance, citing weak demand in China. This environment of reduced demand and increased financial caution adds further pressure on suppliers. Additionally, concentration of customer relationships provides additional leverage to these OEMs, with Ford and Volkswagen accounting for 14% and 11% of the Company's sales in 2023, respectively. Amid these challenges, OEM customers expect annual price reductions as well as stop and go production styles from their suppliers, underscoring the intense cost-cutting pressures in the industry and their impact on supplier margins. According to Bain's industry wide report, when production volumes are flat, supplier costs increase by 7% yet they can only pass 4% of those prices to their OEM customers.

#### Ford Stock Reflected a Lot of Bad Earnings News. It Still Wasn't Enough.

By AI Root | Follow  
Updated Oct 28, 2024, 4:48 pm EDT / Original Oct 28, 2024, 4:55 am EDT

#### Volkswagen's Q3 revenue drops by 41.7% YoY

The automaker attributed the decline to slowing sales in the China market, restructuring expenses for its passenger cars business and investments in new products.

#### Stellantis laying off 1,139 Toledo Jeep workers, as global auto jobs bloodbath expands

James Langley, Jazzy White  
11 November 2024

### Increased competition allows this price pressure

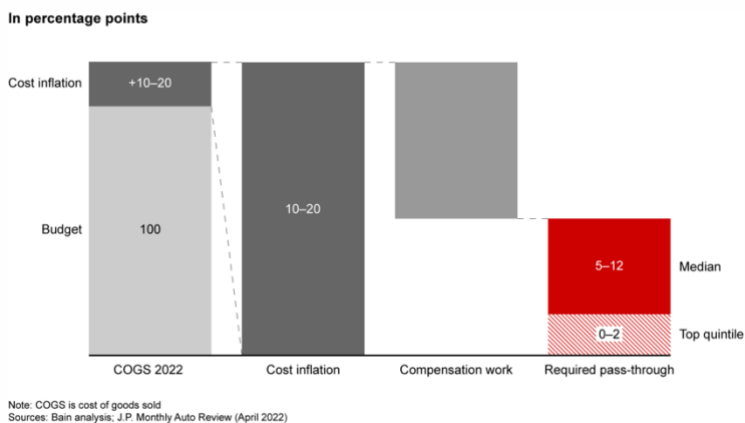
OEM customers can exert significant price pressure on auto suppliers due to increased competition from two main factors: intensified vertical integration among major OEMs and a shift toward international sourcing. Recently, auto manufacturers have formed strategic partnerships and joint ventures, particularly in the EV sector. Notable examples include Tesla's collaboration with Vale, Volvo Trucks' battery assembly plant, and Stellantis' partnership with TotalEnergies. These alliances enable OEMs to consolidate supply chains, reducing reliance on external suppliers while enhancing their competitive positioning in emerging markets.

Moreover, many major OEMs are considering the insourcing of components currently supplied by third-party manufacturers, posing a direct threat to existing suppliers. For instance, Toyota and Tesla have engaged Panasonic as a key battery supplier, while Volkswagen, Stellantis, and BMW have partnered with Samsung SDI, a battery supply chain firm. The increasing inclination of OEMs to source from international suppliers introduces competitive pressure from firms that can produce at lower costs and at competitive prices, given advantages such as lower labor and healthcare costs, reduced tax liabilities, and raw material subsidies. This increasingly competitive landscape poses significant risks to suppliers, potentially limiting their pricing power and impacting overall profitability in an already challenging market environment.

### No capacity to pass costs to suppliers

While facing significant price pressures, BorgWarner also has limited capacity in passing increased costs onto its suppliers. While it claims that it is strategizing to negotiate cost passes, their 2023 efforts have shown cost recovery often below 100% and typically delayed. This inability to offset annual price reductions with equal cost reductions, along with rising raw material costs and increased employee wages, hurts the bottom line. In 2022 and 2023, following negotiations, BorgWarner reached agreements with customers for the pass-through of higher costs; however, these did not fully cover increased expenses, negatively impacting operating margins. As a result, the COGS accounted for 81.9% of net sales in 2023, up from 81.3% in 2022. For the year ended December 31, 2023, gross profit was \$2,568 million with a gross margin of 18.1%, compared to \$2,369 million and 18.7% the previous year. The decrease in gross margin partially reflects these pressures. As a result, BorgWarner has increased dependence on fewer sources for critical components. However, this reliance on a limited number of suppliers may grant them greater leverage, potentially leading to higher prices in the future.

### Suppliers need to pass through parts of cost inflation to minimize margin deterioration

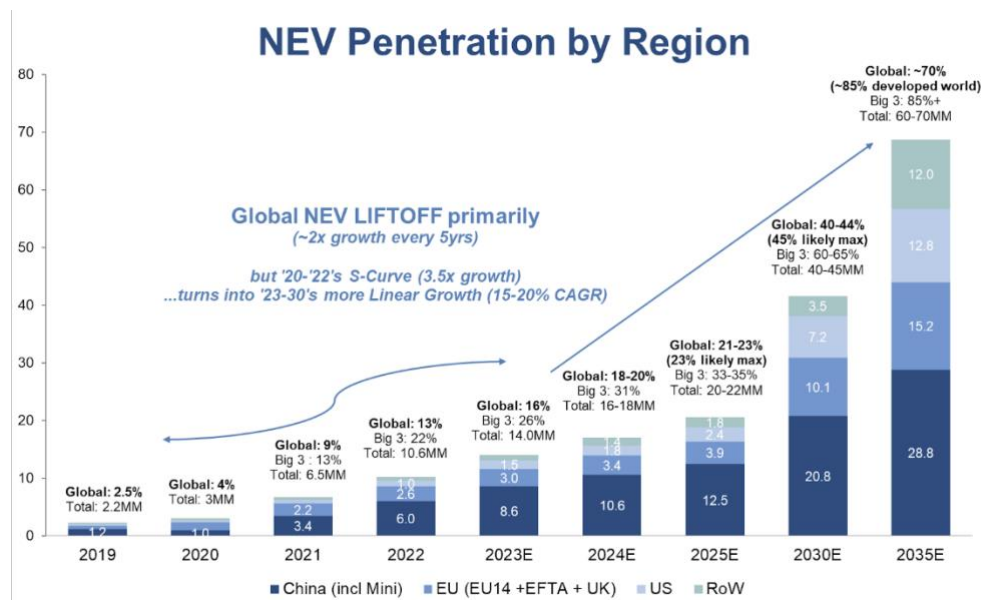


This is concerning given the pressure from OEMs to reduce product prices, which could negatively affect customer relations and overall business performance. This situation is not significantly priced into the market, as the recent announcement of Q3 results showed a 10.1% adjusted operating margin, with guidance adjusted up by 20 basis points from 9.8%. However, the stock has experienced volatility, including a -0.86% decrease over the past five days (Nov 3) as the company also released lower revenue targets, indicating that investors are still reacting to these mixed signals, but still remain optimistic regarding their cost structure.

### Investment Thesis #3: Electrification Investments Strain Near-Term Potential Despite Long-Term Vision

BorgWarner's Foundational portfolio will suffer from negative exogenous factors in the short and medium term, but negative performance will not be offset by outsized returns from eProduct investments until the long term. BorgWarner's aggressive push into electrification has undoubtedly positioned it to capture future market opportunities, but the payoff from these investments is likely to be realized over a much longer horizon than the market expects. While the company has invested over \$2.2 billion in R&D and CapEx focused on EV systems since 2021, including high-profile acquisitions like Eldor, Drivetek, and AKASOL AG, these moves are still in the integration phase. The anticipated synergies are years away from fully materializing, which raises concerns about BorgWarner's ability to deliver near-term returns amidst rising cost pressures.

Despite management's assurances that its focus on electrification will not detract from the Foundational portfolio, there are clear signs that these initiatives are stretching the company's resources. While the Foundational products continue to generate much-needed cash flow, BorgWarner faces headwinds due to escalating input costs, such as steel, lithium, and other critical commodities. These pressures have already led to a squeeze on margins, which is not fully offset by the incremental gains from the company's new EV-focused segments.



Furthermore, the market’s optimism surrounding the electrification strategy may be premature. **Global EV penetration remains heavily concentrated** in China (~60%), Europe (~25%), and the U.S. (~10%), accounting for nearly 95% of global EV sales. As seen in the chart above, this regional concentration highlights the limited immediate upside for BorgWarner, given that broader global adoption is lagging behind. The heavy reliance on these core regions means that BorgWarner’s electrification investments may not generate significant returns until EV adoption rates increase in other markets, which could extend the expected payback period for these investments.

While management has been able to maintain a consistent R&D/Sales ratio, the actual increase in gross R&D spending has not yet translated into significant revenue growth, suggesting that the current strategy may not yield the expected returns in the near term.

While diminished global EV growth prospects are obviously a sully and unwelcome look for BorgWarner’s eProduct ambitions, investors need to adapt to a longer time frame and focus more on the company’s Foundational products portfolio in the meantime, which management says will continue to be the main cash flow generator for the company for now. If BorgWarner can manage its existing customer relationships well and keep its competitive technological edge by developing more all-encompassing products, the Foundational portfolio should experience top line growth over the next three to five years.

However, inflationary pressures in certain commodities, labor, and energy will have a negative impact on the segment’s bottom line. While inflation is decreasing in some areas, the industry is not expected to see price deflation.<sup>2</sup> BorgWarner has experienced notable negative impacts in the steel, aluminum, nickel, palladium, silicon carbide, lithium, and cobalt commodities markets, negatively impacting the company’s margins. These are unlikely to be reconciled through successful execution of the company’s core growth strategies and will likely have a negative impact on bottom line growth over the next couple years.

From *Charging Forward* and strategic acquisitions, it is apparent that the company been altering its business model to transition towards EVs over an extended time horizon. Investments in the company’s eProduct portfolio will not take away from the development and growth of its Foundational portfolio. However, the Street has seemingly overlooked this, expecting that eProduct returns and growth in the EV market will be realized sooner.

## Risks & Mitigants

### Risk #1: Successful Integration of Acquisitions Accelerates Growth

BorgWarner's recent acquisitions, such as Eldor Corporation's Electric Hybrid Systems business and Delphi Technologies, could integrate seamlessly, leading to accelerated synergies, enhanced technological capabilities, and improved profitability.

**Mitigant #1:** Historical integration challenges suggest caution. For instance, the integration of Delphi Technologies, completed in October 2020, was expected to strengthen BorgWarner's electronics and power electronics products. However, the anticipated

<sup>2</sup> BorgWarner FY2023 10-K.



synergies have taken longer to materialize, with ongoing integration efforts impacting operational efficiency. Additionally, the acquisition of Santroll's light vehicle eMotor business in April 2022 aimed to bolster electric propulsion systems leadership, yet the integration process has been resource-intensive, delaying expected benefits. These examples indicate that while acquisitions have strategic merit, the complexities of integration often lead to delays in realizing projected synergies.

### **Risk #2: Ability to Pass Through Costs to Customers Improves Margins**

BorgWarner might effectively negotiate with Original Equipment Manufacturers (OEMs) to pass on rising raw material costs, thereby stabilizing or even improving profit margins.

**Mitigant #2:** Despite efforts, BorgWarner has faced difficulties in fully passing on increased costs to customers. The company's third-quarter 2024 results highlighted strong operational performance and cost controls but also noted that customer recoveries were a contributing factor, implying that not all cost increases were successfully transferred to customers. This suggests that while some cost recovery is achieved, significant pricing pressures from OEMs limit BorgWarner's ability to fully offset rising input costs, thereby constraining margin improvement.

### **Risk #3: Faster-Than-Expected EV Adoption Drives Higher eProduct Revenue**

An accelerated global adoption of electric vehicles (EVs) could lead to increased demand for BorgWarner's eProducts, boosting revenue and market share.

**Mitigant #3:** Current EV adoption rates are growing but remain concentrated in specific regions. In 2023, approximately 60% of new EV registrations were in China, 25% in Europe, and 10% in the United States, collectively accounting for nearly 95% of global EV sales. This regional concentration limits immediate upside potential for BorgWarner, as broader global adoption is lagging. Additionally, the company's third-quarter 2024 results reported a decline in the "PowerDrive Systems" segment by 12.3%, indicating challenges in capitalizing on the current EV market dynamics. These factors suggest that while EV adoption is progressing, it may not accelerate rapidly enough to significantly boost BorgWarner's eProduct revenue in the near term.

## Valuation Assumptions

### Revenue Build

Assumptions: We gathered Vehicle production data from the International Organization of Motor Vehicle Manufacturers (OICA) and separated into three Regions of Europe, NA, and China in accordance to match it will BWA's revenue projections. We split growth in the regions by ICE and EV total production change. We utilized Battery Demand as a proxy to solve for the EV total production change as there was no initial statistics separating this.

*NA:* We chose to look at NAFTA when aggregating data incorporating the US, Canada, and Mexico. We assumed that total production would be at around 9% this year while slowly stagnating back down to 2% in the next 5 years. The percentage makeup of EV's we projected to stagnate around 15% due to lack of funding support, poor EV infrastructure, and higher supplier costs slowing down the conversion.

*Europe:* We chose to incorporate the EU (27 Countries) as well as the UK when aggregating our general data. We assumed that total production would reduce quicker than NA as a result of the structural stagnation the region faces. For our EV conversion we chose to remain at 45% as it has been much more successful in the region but does not hope to see further change due to many incentive programs being cut in 2025.

*China:* We chose to look into China in particularly for parts of Asia as a large majority of BWA's sales are made in the region and thus is a more accurate measure. We project a similar degradation of total growth to about 2% within the next 5 years while having the EV conversion rate still rising to 75% as government incentive and infrastructure plans will continue to see more EV within the country.

### **BWA Foundation vs eProduct Segmentations:**

We split between the Foundation and eProduct Segmentations as well as which regions each segment was sold in, linking it to our broader regional assumptions. For their foundational products, we assumed a general straight line as according to our regional assumptions on ICE production volume growth.

Final Revenue: Overall, we have quite a bearish outlook on BorgWarner's revenue. Our argument that justifies such a quick change from the 12.37% growth we witnessed in 2023 to 1.9% in 2024 is a result of the COVID recovery and not a reasonable prediction for consistent growth for the next 5 years.

Dec ended 31	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Total Revenue</b>		<b>11803</b>	<b>12835</b>	<b>14198</b>	<b>14,467.9</b>	<b>14,600.1</b>	<b>14,692.1</b>	<b>14,763.2</b>	<b>14,835.0</b>	<b>14,889.3</b>	<b>14,929.8</b>
% Change			7.05%	12.37%	1.90%	0.91%	0.63%	0.48%	0.49%	0.37%	0.27%
<b>Assumptions</b>											
NA Total	13,374,404	13,467,065	14,795,419	16,166,628	17,540,791	18,242,423	18,789,696	19,165,490	19,548,799	19,939,775	20,338,571
North America EV	601,848	1,077,365	1,923,404	2,586,660	3,157,342	3,192,424	3,194,248	3,162,306	3,127,808	3,090,665	3,050,786
North America ICE	12,772,556	12,389,700	12,872,015	13,579,968	14,383,449	15,049,999	15,595,447	16,003,184	16,420,992	16,849,110	17,287,785
% change NA Total		0.7%	9.9%	9.3%	9%	4%	3%	2%	2%	2%	2%
% change NA EV		79.0%	78.5%	34.5%	22.1%	1.1%	0.1%	-1.0%	-1.1%	-1.2%	-1.3%
% change NA ICE		-3.0%	3.9%	5.5%	5.9%	4.6%	3.6%	2.6%	2.6%	2.6%	2.6%
% EV		5%	8%	13%	16%	18%	18%	17%	17%	16%	15%
Europe Total	13,570,077	12,929,056	13,608,762	15,344,611	16,879,072	17,385,444	17,733,153	18,087,816	18,268,694	18,451,381	18,635,895
Europe EV	1,628,409	2,909,038	3,674,366	6,905,075	7,595,582	7,823,450	7,979,919	8,139,517	8,220,912	8,303,122	8,386,153
Europe ICE	11,941,668	10,020,018	9,934,396	8,439,536	9,283,490	9,561,994	9,753,234	9,948,299	10,047,782	10,148,260	10,249,742
% change Europe Total		-4.7%	5.3%	12.8%	10%	3%	2%	2%	1%	1%	1%
% change Europe EV		78.6%	26.3%	87.9%	10.0%	3.0%	2.0%	2.0%	1.0%	1.0%	1.0%
% change Europe ICE		-16.1%	-0.9%	-15.0%	10.0%	3.0%	2.0%	2.0%	1.0%	1.0%	1.0%
% EV		12.00%	22.50%	27.00%	45.00%	45%	45%	45%	45%	45%	45%
China Total	25,225,242	26,121,712	27,020,615	30,160,966	32,272,234	34,531,290	36,257,854	37,708,169	39,216,495	40,000,825	40,800,842
China EV	5,801,806	6,530,428	9,997,628	15,382,093	19,363,340	22,445,338	24,655,341	26,395,718	28,235,877	29,600,611	30,600,631
China ICE	19,423,436	19,591,284	17,022,987	14,778,873	12,908,893	12,085,951	11,602,513	11,312,451	10,980,619	10,400,215	10,200,210
% change China Total		3.6%	3.4%	11.6%	7%	7%	5%	4%	4%	2%	2%
% change China EV		12.6%	53.1%	53.9%	25.9%	15.9%	9.8%	7.1%	7.0%	4.8%	3.4%
% change China ICE		0.9%	-13.1%	-13.2%	-12.7%	-6.4%	-4.0%	-2.5%	-2.9%	-5.3%	-1.9%
% EV		23.00%	25.00%	37.00%	51.00%	60%	65%	68%	70%	72%	74%

\*almost all Asia sales in China

<b>ICE vs EV BWA Rev</b>											
Foundational products		11061	11163	12161	12,161.0	12,161.0	12,161.0	12,161.0	12,161.0	12,161.0	12,161.0
% Change			0.92%	8.94%	0%	0.0%	0.0%	0%	0%	0%	0%
eProducts		742	1462	2037	2,306.9	2,439.1	2,531.1	2,602.2	2,674.0	2,728.3	2,768.8
% Change			97.04%	39.33%	13.25%	5.73%	3.77%	2.81%	2.76%	2.03%	1.48%
<b>Segmentation EV</b>											
<b>eCV Battery Systems</b>		<b>207.76</b>	<b>438.6</b>	<b>611.1</b>	<b>672.7</b>	<b>680.7</b>	<b>684.3</b>	<b>685.1</b>	<b>684.0</b>	<b>682.6</b>	<b>681.0</b>
% of eProducts		28%	30%	30%							
Americas		62	132	183	228	231	231	228	225	223	219
% of eCV Battery Systems		30%	30%	30%	34%	34%	34%	33%	33%	33%	32%
Europe		145	307	428	445	450	454	457	459	460	462
% of eCV Battery Systems		70%	70%	70%	66%	66%	66%	67%	67%	67%	68%
<b>LV eProducts</b>		<b>534.24</b>	<b>1023.4</b>	<b>1425.9</b>	<b>1,634.2</b>	<b>1,758.4</b>	<b>1,846.8</b>	<b>1,917.1</b>	<b>1,990.1</b>	<b>2,045.7</b>	<b>2,087.7</b>
% of eProducts		72%	70%	70%							
Europe		214	409	570	596	605	611	617	620	623	626
% of LV eProducts		40%	40%	40%							
China/ROW		267	512	713	861	974	1,057	1,123	1,195	1,250	1,291
% of LV eProducts		50%	50%	50%							
N.A		53	102	143	177	179	179	177	175	173	170
% of LV eProducts		10%	10%	10%							

\*General Straightline Assumption

## Cost Build

Cost Build										
Fiscal year	2021A	2022A	2023A	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Fiscal year end date	12/31/2021	12/31/2023	12/31/2023	12/31/2024	12/31/2025	12/31/2026	12/31/2027	12/31/2028	12/31/2029	12/31/2030
Total Revenue	11,803	12,635	14,198	14467.91302	14600.11878	14692.06915	14763.21682	14835.0369	14889.34567	14929.79457
COGS	9,630	10,266	11,630	11,791	12,031	12,095	12,159	12,221	12,283	12,345
COGS Attributable to PHINIA	2,545	2,616	1,362	0	0	0	0	0	0	0
COGS Attributable to Supplier Negotiations	-	-	170	179	186	191	195	197	199	201
% Growth, COGS Attributable to Supplier Negotiations				5.0%	4.0%	3.0%	2.0%	1.0%	1.0%	1.0%
COGS, Net of PHINIA and Supplier Negotiations	7,085	7,650	10,098	11,613	11,845	11,904	11,964	12,024	12,084	12,144
% Growth, COGS, Net of PHINIA and Supplier Negotiations		7.97%	32.00%	15%	2%	1%	1%	1%	1%	1%
Gross Profit	2,173	2,369	2,568	2,677	2,570	2,597	2,604	2,615	2,607	2,585
COGS % Growth		6.60%	13.29%	1.39%	2.03%	0.54%	0.52%	0.51%	0.51%	0.51%
COGS as a % of Revenue	81.59%	81.25%	81.91%	81.50%	82.40%	82.33%	82.36%	82.38%	82.49%	82.69%
SG&A	1,085	1,290	1,316	1,338	1,356	1,373	1,391	1,409	1,428	1,447
Gross R&D expenditures	694	787	856	689	657	694	692	700	729	748
Customer reimbursements	-108	(86)	(139)	-50	-100	-80	-100	-110	-100	-100
Net R&D expenditures	586	701	717	738.51	757	774	792	810	829	848
% Growth, Net R&D expenditures		19.62%	2.28%	3.00%	2.50%	2.30%	2.30%	2.30%	2.30%	2.30%
SG&A, Net of Net R&D expenditures	499	589	599	599	599	599	599	599	599	599
Restructuring expense	108	48	79	72	73	73	74	74	74	75
% of Revenue	0.92%	0.38%	0.56%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Merger and acquisition expense, net	48	9	23	15	17	10	12	8	7	11
Asset impairments and lease modifications	0	30	29	10	10	10	10	10	10	10
Gain on sale of assets	0	-	-13	0	0	0	0	0	0	0
Spin-Off transition services income, net	0	-	-10	0	0	0	0	0	0	0
(Gain) loss on sale of business	29	(13)	-5	5	5	5	5	5	5	5
Other income, net	-11	(4)	-11	0	0	0	0	0	0	0
<b>Other operating expense, net</b>	<b>66</b>	<b>22</b>	<b>13</b>	<b>30</b>	<b>32</b>	<b>25</b>	<b>27</b>	<b>23</b>	<b>22</b>	<b>26</b>
<b>Operating (loss) income</b>	<b>914</b>	<b>1,009</b>	<b>1,160</b>	<b>1,237</b>	<b>1,109</b>	<b>1,125</b>	<b>1,112</b>	<b>1,108</b>	<b>1,082</b>	<b>1,037</b>
Equity in affiliates' earnings, net of tax	-42	-28	-30	-30	-30	-30	-30	-30	-30	-30
Realized and unrealized loss on debt and equity securities	362	73	174	170	170	170	170	170	170	170
Interest expense, net	91	51	10	10	10	10	10	10	10	10
Other postretirement expense (income)	-7	0	15	20	20	20	20	0	0	0
<b>Earnings from discontinued operations before income taxes</b>	<b>510</b>	<b>913</b>	<b>991</b>	<b>1,067</b>	<b>939</b>	<b>955</b>	<b>942</b>	<b>958</b>	<b>932</b>	<b>887</b>
Provision for income taxes	65	195	289	224.04	197.10	200.52	197.92	201.17	195.77	186.28
<b>Net (loss) earnings from discontinued operations attributable to PHIN</b>	<b>194</b>	<b>308</b>	<b>-7</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Net earnings from continuing operations attributable to the noncontro	102	82	70	74	67	67	67	66	65	62
% of Earnings from discontinued operations before income taxes, N	11.16%	8.13%	6.03%	6%	6%	6%	6%	6%	6%	6%
D&A Expense	574	552	582	567	602	624	636	645	654	661

## Assumptions

### COGS

Supplier Negotiations: COGS is expected to experience a 5% and 4% growth in the short term due to ongoing supplier negotiations. This is based on current discussions and the impact of this year's results, which indicate a roughly 4% increase in COGS. The assumption is that the dynamics driving this growth will persist at the same rate in the near future.

PHINIA Divestiture: The effects of the PHINIA divestiture have been accounted for by subtracting the relevant impact from future COGS projections. With the divestiture, the company will no longer incur costs related to the PHINIA business, and this adjustment has been factored into the cost base for future periods.

Short-Term Disruption in COGS:

For the near term, we expect a continued disruption in COGS, with an approximate growth rate of 15%. This reflects a continuation of the 32% COGS growth observed this year, which is expected to normalize as we move beyond the current period. The 15% growth is a short-term impact driven by market conditions, supplier pricing pressures, and potential operational inefficiencies related to the divestiture process.

### SG&A

Selling, General, & Administrative expenses are expected to remain flat in line with current projections. No significant deviations are anticipated, as there is no new thesis or operational change expected to drive higher or lower costs in these areas.

### R&D

Research & Development expenses are also projected to remain stable, with no substantial changes in the near term. We expect R&D spending to continue at the same level as current projections.

## Companies Comparable

COMPARABLE COMPS (all numbers in millions)

Company Name	Stock Ticker	Market Cap	Revenue (Sep 30 2024)	EBITDA	EBIT	EV	Total Debt	Debt-to-Equity Ratio	EV/EBITDA	Levered 5Y Beta	Tax Rate	Unlevered Beta
Dana Incorporated	NYS: DAN	1232.3	10433	770	338	4066.3	2985	170.80%	5.28x	1.70	21%	0.72
Magna International Inc.	NYSE: MG	16851.3	57634.2	5212	2734.3	26224.2	10248	59.80%	5.03x	1.27	27.20%	0.88
American Axle & Manufacturing, I	NYS: AXL	731.4	6207.1	740	264.3	2984.7	2795.8	453.60%	4.03x	1.81	37.10%	0.47
Valeo SE (EUR)	(ENXTPA:FR)	2222.8	21949	1868	873	7013.8	7036	159.50%	3.75x	1.26	35.90%	0.62
Schaeffler AG	XTRA:SHA0	9443.4	16381	2013	1020	9443	5765	147.20%	4.69x	0.00	30%	0.00
Garrett Motion Inc.	NAS: GTX	1646.6	3576	564	473	3074.6	1524	-202.07%	5.45x	0.88	25%	
<b>Borgwarner (BWA)</b>		7418.3	14169	1882	1232	10353	4739	74.60%	5.50x	0.95	29%	0.62
<b>Median</b>									4.86x			
<b>Average</b>									4.71x			
<b>25th Percentile</b>									4.20x			
<b>75th Percentile</b>									5.22x			

## DCF

Fiscal year	Financials Summary									
	Historical			Projected						
	2021A	2022A	2023A	2024E	2025E	2026E	2027E	2028E	2029E	2030E
<b>Net sales</b>	11,803	12,635	14,198	14,468	14,600	14,692	14,763	14,835	14,889	14,930
% change revenue growth		7.0%	12.4%	1.9%	0.9%	0.6%	0.5%	0.5%	0.4%	0.3%
<b>COGS</b>	9,630	10,266	11,630	11,791	12,031	12,095	12,159	12,221	12,283	12,345
% of revenue	81.6%	81.3%	81.9%	81.5%	82.4%	82.3%	82.4%	82.4%	82.5%	82.7%
<b>EBIT</b>	914	1,009	1,160	1,237	1,109	1,125	1,112	1,108	1,082	1,037
%rev	7.7%	8.0%	8.2%	8.5%	7.6%	7.7%	7.5%	7.5%	7.3%	6.9%
tax rate			29.0%	29.0%	28.0%	25.0%	25.0%	25.0%	25.0%	25.0%
<b>D&amp;A</b>	574	552	582	567	602	624	636	645	654	661
%rev	4.9%	4.4%	4.1%	3.9%	4.1%	4.3%	4.3%	4.4%	4.4%	4.4%
<b>CapEx</b>	516	622	832	800	750	700	700	700	700	700
%rev	4.4%	4.9%	5.9%	5.5%	5.1%	4.8%	4.7%	4.7%	4.7%	4.7%
<b>NWC</b>	2,799	1,711	2,450	2,832	3,179	3,613	4,047	4,505	4,947	5,353
%rev	23.7%	13.5%	17.3%	19.6%	21.8%	24.6%	27.4%	30.4%	33.2%	35.9%
<b>Change in NWC</b>		(1,088)	739	382	347	434	434	458	442	406
<b>FCF</b>		2,027	(165)	263	304	334	336	318	323	332
<b>Discounted FCF</b>				246.90	267.59	275.96	260.75	231.40	220.48	212.41

WACC Calculation	
Risk Free	4.31%
Unlevered Beta	0.62
Levered Beta	0.95
Equity Risk Premium	4.04%
Effective Tax Rate	29.00%
Cost of Equity	8.15%
Cost of Debt	5.81%
Current Stock Price	\$33.92
Shares Outstanding	218.70m
Market Cap	\$7.42bn
Total Debt	4.74
Net Debt	2.32
Market Cap	7.42
Percent Equity	61%
Percent Debt	38.98%
WACC	6.58%

\*wacc was messed up

Terminal Value: Gordon Growth Method	
Terminal Growth Rate	2.0%
Terminal Value	7,387.71
Present Value of TV	3,905.43
Sum of Near Term Cash Flc	1,715.49
Implied Enterprise Value	5,620.92
Implied Equity Value	5,618.60
Implied Share Price	25.69
Implied Upside	-24.26%

Terminal Value: Exit Multiples Method	
Median EV/EBITDA	4.86x
Terminal Value	8,252.50
Present Value of TV	4,362.59
Implied Enterprise Value	6,078.08
Implied Equity Value	6,075.76
Implied Share Price	27.78
Implied Upside	-18.10%

### Sensitivity Analysis

Discount Rate (WACC):	Terminal FCF Growth Rate							
	25.69	1.25%	1.50%	1.75%	2.00%	2.25%	2.50%	2.75%
Gordon Growth Method	5.00%	33.46	35.32	37.47	39.98	42.94	46.50	50.85
	5.50%	29.31	30.69	32.25	34.04	36.10	38.50	41.34
	6.00%	26.06	27.11	28.29	29.61	31.11	32.82	34.79
	6.50%	23.45	24.27	25.17	26.18	27.31	28.57	30.01
	7.00%	21.30	21.95	22.67	23.45	24.32	25.29	26.37
	7.50%	19.51	20.03	20.61	21.23	21.92	22.67	23.51
	8.00%	17.99	18.42	18.89	19.39	19.95	20.55	21.20

Discount Rate (WACC):	Terminal EBITDA Multiple							
	27.78	3.50	4.00	4.50	5.00	5.50	6.00	6.50
Exit Multiple Method	5.00%	24.98	27.36	29.75	32.13	34.51	36.90	39.28
	5.50%	24.06	26.33	28.60	30.87	33.14	35.42	37.69
	6.00%	23.17	25.34	27.51	29.67	31.84	34.01	36.18
	6.50%	22.33	24.40	26.46	28.53	30.60	32.67	34.74
	7.00%	21.53	23.50	25.47	27.45	29.42	31.39	33.36
	7.50%	20.76	22.64	24.53	26.41	28.29	30.18	32.06
	8.00%	20.03	21.83	23.63	25.42	27.22	29.02	30.82



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# Occidental Petroleum (NYSE: OXY)

## Investment Summary:

Occidental is an American upstream oil and gas company with ancillary segments including Chemicals, Midstream & Marketing, and Low Carbon Ventures. Though we are cautious on near-term crude oil fundamentals (and as such, are cautious with levered oil names) we believe that Occidental still has the opportunity to incrementally pay down accumulated acquisition-related debt to bolster its balance sheet and increase incrementally returning cash to shareholders. Given Occidental's strong operational performance due to its robust asset base, the EoR program, and decreasing unit production costs amid a strong near-term production profile, we believe that Occidental can turn around its soft oil and gas segment. Additionally, we believe that the market is overlooking the option value of Occidental's low carbon ventures division (DAC and CCUS) as investors are discounting the entirety of Occidental over its oil and gas segment. Occidental is currently developing the world's largest DAC facility which it plans to monetize starting mid-2025. We believe that Occidental's DAC segment will allow OXY to realize longer dated upside as Occidental looks to achieve net-zero oil.

## Key points:

1. Robust, high-quality asset base
  - Strong YTD operational performance with decreasing NT costs
  - But we are still waiting on stronger oil market fundamentals
2. Leader in DAC and CCUS
  - Occidental is building the world's largest direct air capture facility with proprietary technology
  - Monetization of credits to lead to longer-dated upside
3. Strengthening balance sheet
  - Stronger FCF generation and asset sales to help pay down acquisition-related debt that has burned investors.

## Company Overview

Occidental is an American upstream oil and gas company. The company is known for its strong presence in shale oil production, particularly in the Permian basin in the southwestern part of the United States. Occidental's principal businesses consist of three reporting segments: oil and gas, chemical and midstream and marketing. The oil and gas segment explores for, develops and produces oil, natural gas liquids, and natural gas. The chemical segment (which is run by the subsidiary OxyChem) primarily manufactures and markets basic chemicals and vinyls. The midstream and marketing segment purchases, markets, gathers, processes, transports and stores oil, NGL, natural gas, CO2 and power. It also optimizes its transportation and storage capacity, and invests in entities that conduct similar activities, such as Western Midstream Partners (NYSE: WES). The midstream and marketing segment also includes Oxy Low Carbon Ventures ("OLCV"). OLCV develops CCUS projects, including DAC technology, and invests in other low-carbon technologies intended to reduce GHG emissions from its operations and to commercialize these operations into other industries to help reduce their emissions.

Rating	<b>Positive</b>		
Price (11 15 24)	<b>\$49.97</b>		
Price Target	<b>\$60.62</b>		
52W Range	<b>\$48.42 – 71.19</b>		
Market Cap	<b>\$49,489</b>		
EPS (FY 2023)	<b>\$3.90</b>		
Consensus	<b>\$56.00</b>		
Ticker	<b>NYSE: OXY</b>		

USD, mm	2023A	2024E	2025E
<b>Revenue</b>	28,918	33,243	34,866
<b>% Growth</b>	(23.87)%	15.33%	4.98%
<b>EBITDA</b>	13,705	16,906	17,037
<b>% Growth</b>	(34.62)%	23.36%	0.78%
<b>Profit (loss)</b>	4,696	7,628	9,426

## Price Performance Chart



## Research Analysts

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### Oil & gas:

Occidental primarily conducts its ongoing exploration and production activities in the United States, the Middle East and North Africa. Within the United States, Occidental has operations primarily in Texas, New Mexico and Colorado, as well as onshore in the Gulf of Mexico. Internationally, Occidental primarily conducts operations in the UAE, Oman and Algeria.

### COMPARATIVE OIL AND GAS PROVED RESERVES AND SALES VOLUMES

Oil and NGL is in MMbbl; natural gas is in Bcf.

	2023				2022				2021			
	Oil	NGL	Gas	Boe <sup>(a)</sup>	Oil	NGL	Gas	Boe <sup>(a)</sup>	Oil	NGL	Gas	Boe <sup>(a)</sup>
<b>Proved Reserves</b>												
United States	1,600	802	4,235	3,108	1,639	654	4,073	2,972	1,466	564	3,419	2,600
International	340	181	2,117	874	274	192	2,277	845	305	202	2,431	912
<b>Total</b>	<b>1,940</b>	<b>983</b>	<b>6,352</b>	<b>3,982</b>	<b>1,913</b>	<b>846</b>	<b>6,350</b>	<b>3,817</b>	<b>1,771</b>	<b>766</b>	<b>5,850</b>	<b>3,512</b>
<b>Sales Volumes</b>												
United States	195	90	480	365	185	83	445	342	182	79	477	341
International <sup>(b)</sup>	39	13	176	81	41	12	164	81	44	12	172	85
<b>Total</b>	<b>234</b>	<b>103</b>	<b>656</b>	<b>446</b>	<b>226</b>	<b>95</b>	<b>609</b>	<b>423</b>	<b>226</b>	<b>91</b>	<b>649</b>	<b>426</b>

<sup>(a)</sup> Natural gas volumes are converted to Boe at six Mcf of gas per one barrel of oil. Conversion to Boe does not necessarily result in price equivalency.

<sup>(b)</sup> Excluded sales volumes related to Occidental's discontinued operations in 2021.

### Chemicals:

OxyChem owns and operates manufacturing plants at 21 domestic sites in Alabama, Georgia, Illinois, Kansas, Louisiana, Michigan, New Jersey, Ohio, Tennessee and Texas and at two international sites in Canada and Chile.

Principal Products	Major Uses	Annual Capacity
<b>Basic Chemicals</b>		
Chlorine	Raw material for EDC, water treatment and pharmaceuticals	3.2 million tons
Caustic soda	Pulp, paper and aluminum production	3.3 million tons
Chlorinated organics	Refrigerants <sup>(a)</sup> , silicones and pharmaceuticals	1 billion pounds
Potassium chemicals	Fertilizers, batteries, soaps, detergents and specialty glass	0.4 million tons
EDC	Raw material for VCM	2.1 billion pounds
Chlorinated isocyanurates	Swimming pool sanitation and disinfecting products	150 million pounds
Sodium silicates	Catalysts, soaps, detergents and paint pigments	0.6 million tons
Calcium chloride	Ice melting, dust control, road stabilization and oil field services	0.7 million tons
<b>Vinyls</b>		
VCM	Precursor for PVC	6.2 billion pounds
PVC	Piping, building materials and automotive and medical products	3.7 billion pounds
Ethylene	Raw material for VCM	1.3 billion pounds <sup>(b)</sup>

<sup>(a)</sup> Includes 4CPE, a raw material used in making next generation refrigerants with low global warming and zero ozone depletion potential.

<sup>(b)</sup> Amount is gross production capacity for 50/50 joint venture with Orbia.

### Midstream & marketing:

Occidental's midstream and marketing operations primarily support its oil and gas segment through trading activities. "Trading" refers to optimizing the date and location of delivery of its products through their midstream gathering, processing, transportation, storage and terminal facilities. To generate returns, the segment evaluates opportunities across the value chain to provide services to Occidental subsidiaries, as well as third parties. The midstream and marketing segment operates or contracts for services on gathering systems, gas plants, co-generation facilities and storage facilities and invests in entities that conduct similar activities, such as WES and Dolphin Energy ("DEL") (51% owned by Mubadala, 24.5% by Total, and 24.5% by Occidental), which are accounted for as equity method investments. WES owns gathering systems, plants and pipelines and earns revenue from fee-based and service-based contracts with Occidental and third parties. DEL owns and operates a pipeline that connects its gas processing and compression plant in Qatar and its receiving facilities in the UAE, and uses its network of DEL-owned and other existing leased pipelines to supply natural gas across the UAE and to Oman. The midstream segment includes Al Hosn Gas, a processing facility in the UAE that removes sulfur from natural gas and processes the natural gas and sulfur for sale. The midstream and marketing segment also includes OLCV businesses.



Location	Description	Capacity <sup>(a)</sup>
<b>Gas Plants</b>		
Texas, New Mexico and Colorado	Occidental and third-party-operated natural gas/CO <sub>2</sub> gathering, compression and processing systems	2.2 Bcf/d
Texas, Rocky Mountains and Other	Equity investment in WES - gas processing facilities	5.2 Bcf/d
UAE	Natural gas processing facilities for Al Hosn Gas	1.45 Bcf/d
<b>Pipelines and Gathering Systems</b>		
Texas, New Mexico and Colorado	CO <sub>2</sub> fields and pipeline systems transporting CO <sub>2</sub> to oil and gas producing locations	2.8 Bcf/d
Qatar, UAE and Oman	Equity investment in the DEL natural gas pipeline	3.2 Bcf/d
United States	Equity investment in WES involved in gathering and transportation	15,794 miles of pipeline
<b>Power Generation</b>		
Texas and Louisiana	Occidental-operated power and steam generation facilities	1,218 megawatts of electricity and 1.6 million pounds of steam per hour
<b>OLCV</b>		
Texas	Occidental-owned solar generation facility	16.8 megawatts of electricity
Texas	Equity investment in a near-zero emission natural gas based power generation demonstration facility	up to 50 megawatts of electricity

<sup>(a)</sup> Amounts are gross, including interests held by third parties.

WES is a publicly traded limited partnership with its limited partner units traded on the NYSE under the ticker symbol WES. As of June 30, 2024, Occidental owned all of the 2.3% non-voting general partner interest, 48.7% of the WES limited partner units, and a 2% non-voting limited partner interest in WES Operating, a subsidiary of WES. As of June 30, 2024, Occidental's combined share of net income from WES and its subsidiaries was 50.9%

In 2023, Occidental and BlackRock formed a joint venture for the continued development of the first commercial scale direct air capture facility in Ector County, Texas. The joint venture is a VIE and Occidental consolidates the VIE as it is the primary beneficiary. BlackRock's investment is accounted for as an NCI. Each party has committed to make additional investments towards the completion of the direct air capture facility, with BlackRock committed to invest up to \$550 million.

Occidental may call the NCI on June 30, 2035, or earlier if the plant does not achieve commercial operations or ceases and permanently discontinues operations. Dividends from the joint venture will be distributed preferentially to the NCI up to a return threshold, then preferentially to Occidental thereafter. The NCI receives preferential distributions in liquidation.

### **Company History & Recent Events:**

Founded in 1920 in Los Angeles, Occidental Petroleum initially established itself as a prominent player in the oil and gas industry under the leadership of Armand Hammer, who took over as president and CEO in 1957. Under Hammer's guidance, Occidental embarked on a period of aggressive expansion during the 1960s and 1970s, establishing operations in multiple regions, including Peru, Venezuela, Bolivia, Trinidad, and the United Kingdom. The acquisition of Hooker Chemical in 1968 marked Occidental's diversification into chemicals, forming the foundation of what would become OxyChem, a significant arm of the business. This diversification was a turning point for the company, allowing it to broaden its portfolio beyond oil and gas.

The 1980s and 1990s were a period of both growth and challenges for Occidental. In 1983, the company, in collaboration with Colombia's Ecopetrol, discovered the Caño Limón oilfield, one of the largest oil discoveries in South America. Occidental continued to expand its global footprint, notably acquiring the Elk Hills Oil Field in 1997, one of the largest fields in the United States. However, the company also faced tragedies, such as the 1988 Piper Alpha disaster in the North Sea, which claimed 167 lives and remains the deadliest offshore oil disaster in history. During this time, Occidental also ventured into joint ventures, such as its potassium carbonate plant in Alabama, and made strategic divestitures, including selling its coal operations in the early 1990s to streamline its focus on core segments. The passing of Armand Hammer in 1990 marked the end of an era, and under new leadership, Occidental began to sharpen its focus on oil and gas, exiting non-core businesses and positioning itself as a leading player in these industries.

In the 21st century, Occidental continued to solidify its presence as a major force in the energy sector while also embracing new opportunities in sustainability. The acquisition of Anadarko Petroleum in 2019 for \$57 billion was a transformative deal, making it one of the largest oil and gas acquisitions in history and enhancing Occidental's presence in the Permian Basin, a region crucial to U.S. shale oil production. The deal was financed through a combination of debt, equity, and an unconventional financing arrangement with Berkshire Hathaway. Specifically, Occidental secured \$10 billion in financing from Warren Buffett's Berkshire Hathaway in the form of preferred stock, which paid an 8% annual dividend. This provided critical funding to outbid Chevron

for the acquisition. Furthermore, Occidental took on a significant amount of debt to complete the transaction and also issued new equity to Anadarko shareholders (received \$59 in cash and 0.2934 shares of Occidental common stock for each Anadarko share). This acquisition was instrumental as it provided Occidental access to Anadarko’s lucrative offshore assets in the Gulf of Mexico, as well as international operations in regions such as Algeria and Mozambique, where Anadarko had stakes in large LNG projects.

Additionally, the company also made significant strides in carbon capture technology by acquiring Carbon Engineering in 2023 for \$1.1 billion, aligning with its goal to lead in direct air capture (DAC) technology to reduce carbon emissions. And finally, in 2024, Occidental acquired another key player in Permian Basin, CrownRock, for \$12 billion to further strengthen its oil and gas portfolio, financed through a combination of \$9.1 billion in newly issued debt, \$1.7 billion in common equity, and the assumption of \$1.2 billion of CrownRock’s existing debt. The transaction increased Occidental’s portfolio of high-margin, low-decline unconventional production by approximately 170,000 barrels of oil equivalent per day (Mboed) and added over 94,000 net acres of prime Permian Basin land to Occidental’s existing holdings. These strategic moves over the past decade highlight Occidental’s dual focus: maintaining its leadership in traditional energy sectors while investing in innovative technologies that support a transition to lower-carbon solutions.

## Industry Overview

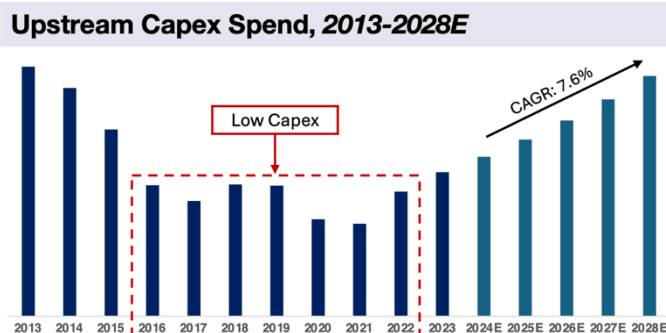
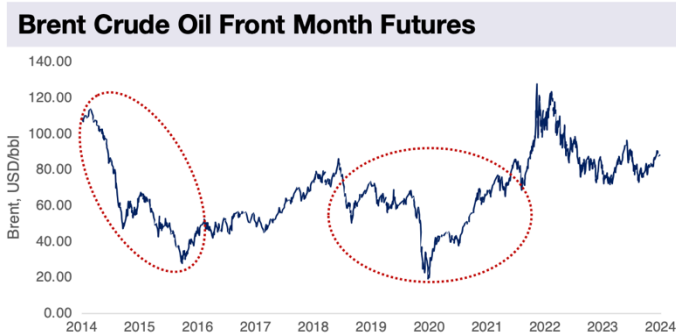
The upstream oil and gas industry is highly competitive with large barriers to entry. Their competitors on a global scale include the supermajors such as ExxonMobil, Chevron, Shell, BP, Total, and Eni. Domestically, their competitors include EOG resources, ConocoPhillips, and Devon Energy. There has been increasing consolidation in the upstream segment as players look to secure future reserves. Oil companies compete on the “quality” of their reserves, which is to say, how cheaply they can produce their oil, which is largely dictated by the nature of their reserves in terms of size and ease of extraction.

To understand Occidental Petroleum, one must understand the shale industry in the United States and its history. America, particularly in areas like Western Texas, Oklahoma, Wyoming & Colorado, and in Appalachia, there was a lot of oil that was previously thought to be unrecoverable due to the fact that it was trapped in porous, unconventional, rock, called shale. However, given advances in fracturing technology (fracking), such porous rock was able to be broken down in a controlled manner which allowed for the oil to be effectively extracted. This result in the so-called “shale boom” which precipitously increased the United States oil output and brought the United States to become the world’s largest producer of oil. This was also made possible by strong oil market fundamentals which resulted in a high price of oil, thereby making the large upfront capex cost of developing shale wells affordable.

It is important to note that the oil industry is highly volatile due to the volatile nature of oil prices given its reliance on the balance of physical supply and demand at any given time. To this end, oil producers, unlike more “normal” corporations are unable to control the price of the product that they sell. Similarly, oil companies fundamentally obtain most of their value not at the corporate level (as would be the case for the aforementioned “normal” company) and instead get their value from the quality of their assets: I other words, what they own in the ground that can be reasonably expected to be produced.

In 2015, due to a supply glut of oil, prices dropped dramatically. This led to a decrease in Capex spend from 2015 that was sustained through 2020. Of course, the pandemic greatly impacted the oil industry as the price of oil even went negative at one point.

*Industry dynamic example: Oil companies had no incentive to invest amid oil market downturns, resulting in low capex*



As a producer of oil, NGL and natural gas, Occidental competes with numerous other domestic and international public, private and government producers. Oil, NGL and natural gas are sensitive to prevailing global and local market conditions, as well as

anticipated market conditions. Occidental's competitive strategy relies on producing hydrocarbons in a capital efficient manner through developing conventional and unconventional fields and utilizing primary, secondary (waterflood) and tertiary (CO2 and steam flood) recovery techniques in areas where Occidental has a competitive advantage as a result of its successful operations or investments in shared infrastructure. Occidental also competes to develop and produce its worldwide oil and gas reserves safely, sustainably and cost-effectively, maintain a skilled workforce and use high quality service providers. Occidental believes that its core competencies in CO2 separation, transportation, use, recycling and storage in EOR provide a competitive advantage over its peers as the world transitions to a less carbon-intensive economy and seeks to remove CO2 from the atmosphere.

OxyChem competes with numerous other domestic and international chemical producers. OxyChem's market position was first or second in the United States in 2023 for the principal basic chemical products it manufactured and marketed as well as for VCM. OxyChem ranks in the top three producers of PVC in the United States. OxyChem's competitive strategy is to be a low-cost producer of its products in order to compete on price.

Occidental's midstream and marketing businesses operate in competitive and highly regulated markets. Occidental competes for capacity and infrastructure for the gathering, processing, transportation, storage and delivery of its products, which are sold at current market prices or on a forward basis to refiners, end users and other market participants. Occidental's marketing business competes with other market participants on exchange platforms and through other bilateral transactions with direct counterparties. OLCV and its businesses and investees also face a broad range of competitors, with nascent markets for low-carbon products and CO2 removal credits that are subject to rapidly changing laws, regulations, policies and reporting and verification mechanisms that can significantly impact the financing, construction and operation of projects and the development of markets.

Comparable Companies							
Company Name	Exchange	Market	Enterprise	LTM	LTM EV/	NTM	NTM EV/
	Ticker	Capitalization	Value	EBITDA	EBITDA	EBITDA	EBITDA
<i>(all figures in USD millions, except per share figures)</i>							
EOG Resources	OXY-US	76,907.02	74,561.02	12,607.00	5.79x	12,513.35	5.96x
Diamondback Energy	EOG-US	52,831.70	66,394.70	6,625.00	8.96x	10,007.88	6.63x
Permian Resources A	FANG-US	12,645.33	16,386.96	3,467.69	4.44x	3,872.26	4.23x
Ovintiv	PR-US	11,927.80	17,810.80	4,703.00	3.99x	4,381.04	4.07x
APA	OVV-US	8,141.69	15,495.69	5,663.00	2.75x	5,294.91	2.93x
Matador Resources	APA-US	7,244.57	10,874.36	2,309.06	4.69x	2,662.09	4.08x
SM Energy	MTDR-US	5,087.50	6,080.46	1,685.76	3.07x	2,279.98	2.67x
Average Industry Multiples					4.8x		4.4x
Median Industry Multiples					4.4x		4.1x

## Investment Thesis

### *Investment thesis and valuation summary:*

Though we are cautious on near-term crude oil fundamentals, and therefore realize the risks associated with a levered oil player, we believe that Occidental still has the opportunity to incrementally pay down accumulated acquisition-related debt and therefore reinstate returning cash to shareholders. Understandably, investors feel burnt over Occidental's acquisition of Anadarko in 2019 despite the quality assets that it brought under Occidental's belt. This feeling is still lingering among the market as Occidental's heavy balance sheet remains a drag on earnings and stability. However, given Occidental's strong operational performance due to its robust asset base, the EoR program, and decreasing unit production costs amid a strong near-term production profile, we believe that Occidental can turn around its soft oil and gas segment. This is especially true with stronger oil market fundamentals and given a normalization in oil prices. Additionally, we believe that the market is overlooking Occidental's low carbon ventures division (DAC and CCUS) as investors are discounting Occidental over its oil and gas segment. Occidental is currently developing the world's largest DAC facility which it plans to monetize starting mid-2025. We believe that Occidental will have a first-mover advantage in the key and quickly growing industry of DAC and CCUS and will allow Occidental to have long-dated upside as oil may be phased out in the long-term. Occidental's investments in carbon reduction technology will allow them to become the world's first truly net-zero oil company. We also remind readers that Occidental has a strong chemicals segment (OxyChem) that brings stability to an otherwise cantankerous company in a volatile industry.

We value Occidental Petroleum using a NAV/DCF mix. In NAV, we use conservative commodity price assumptions given weakness in oil market fundamentals and low visibility in near-term improvement. In our base case, we forecast a long-term WTI price incrementally above \$60.00 and Brent of \$68.00. In our down case for commodity prices (long-term price of \$35.00 for WTI) with our long-term production case, we only see minimal downside (~7%) given OXY's current valuation (at its 52-week low). In our base case production and commodity prices NAV, we value Occidental's proved developed reserves, along with its chemicals and midstream & marketing segment at ~\$81 billion. Adjusting for balance sheet items yields an equity value of ~\$57 billion which translates to a share price of ~\$60.00 per share (20% upside). Using our 75%/25% NAV/DCF mix, we have set a target share price of \$60.62 per share. This represents a 8.25% premium to brokers consensus.

**1. Investors waiting to see clouds disperse to see sunnier days ahead: With a robust high-quality asset base, increased cash flow generation to pay down debt and increased operational efficiency & output from new assets will help heal investors after being burnt by Occidental's costly acquisition of Anadarko.**

The sentiment for levered oil equities, such as Occidental, is a mixed bag given uncertainty associated with post U.S. election policies, the Iran-Israel conflict, and a potentially contentious OPEC+ meeting in early December. We are cautious on near-term crude oil fundamentals given the potential return of OPEC+ barrels into the market and where non-OPEC supply growth could potentially outpace demand growth alone. Occidental has made a series of transformational acquisitions and asset divestment deals to bolster its position in U.S. shale, including the ~\$57bn merger with Anadarko in 2019 and the recent ~\$12bn acquisition of CrownRock. Since 2021, Occidental has reduced its net debt by ~\$9bn to ~\$17.9bn as of the end of 2Q24, but more work needs to be done on the balance sheet following the incremental leverage assumed in the CrownRock acquisition, which closed in August. We estimate the company's leverage ratio of ~#. #x at the end of 2025. Occidental has outlined a near-term debt reduction target of \$4.5bn within 1 year of the CrownRock transaction and has already completed ~70% or \$3.1bn of this near-term goal. Occidental remains focused on strengthening its balance sheet and has prudently suspended its buyback program until debt declines to \$15bn.

Understandably, investors feel burnt over Occidental's acquisition of Anadarko in 2019 despite the quality assets that it brought under Occidental's belt. This is as Occidental was engaged in a bidding war with Chevron over Anadarko, which raised the purchase price for Anadarko significantly. In connection with the acquisition, Occidental issued \$13.0 billion of new senior unsecured notes, \$8.8 billion of term loans, and 100,000 shares of series A preferred stock with a warrant to purchase 80 million shares of Occidental common stock at an exercise price of \$62.50 for \$10 billion. Additionally, Occidental increased its existing \$3.0 billion revolving credit facility by an additional \$2.0 billion in commitments. As such, it is generally accepted by investors that Occidental overpaid for Anadarko by quite a large margin. This feeling is still lingering among the market as Occidental's heavy balance sheet remains a drag on earnings and stability. Further, in 2020, the pandemic sent oil prices crashing, greatly injuring many upstream oil companies, including Occidental, which booked a net loss of \$9.12/sh. in the second quarter and an associated asset impairment of \$6.2 billion. Saddled with high debt due to the acquisition, Occidental dove headfirst into the oil market crash with a leveraged balance sheet. Consequently, OXY traded down 90% from its peak as its debt was rated as high-yield. The combination of an expensive acquisition and the crash in the oil markets bittered investors, sending OXY down nearly 70% from the end of February to mid-March, and has been trading at a discount to peers since.

Furthermore, In December 2023, Occidental entered into an agreement to purchase CrownRock L.P. for total consideration of approximately \$12.4 billion, consisting of approximately \$9.4 billion of cash consideration (inclusive of certain working capital and other customary purchase price adjustments), approximately 29.6 million shares of common stock of Occidental, and the assumption of \$1.2 billion of existing debt of CrownRock. In connection with the CrownRock Acquisition, Occidental issued \$5.0 billion of new unsecured notes, a \$2.0 billion 364-day term loan, and a \$2.7 billion two-year term loan. The acquisition closed August 1, 2024, adding to Occidental's oil and gas portfolio in the Delaware and Midland basins.

However, it is important to note that the CrownRock acquisition has unlocked high quality acreage in the Midland basin which complements Occidental's strong position in the Delaware. Due to the Midland's proximity to the Delaware, they will be able to share infrastructure, which will allow Occidental to decrease its per unit production costs and development costs, though some infrastructure still has to be developed, as per the 1Q 2024 management earnings call. The acquisition added approximately 170 thousand barrels of oil equivalent per day (Mboed) of high-margin, lower-decline unconventional production in 2024, as well as approximately 1,700 undeveloped locations.

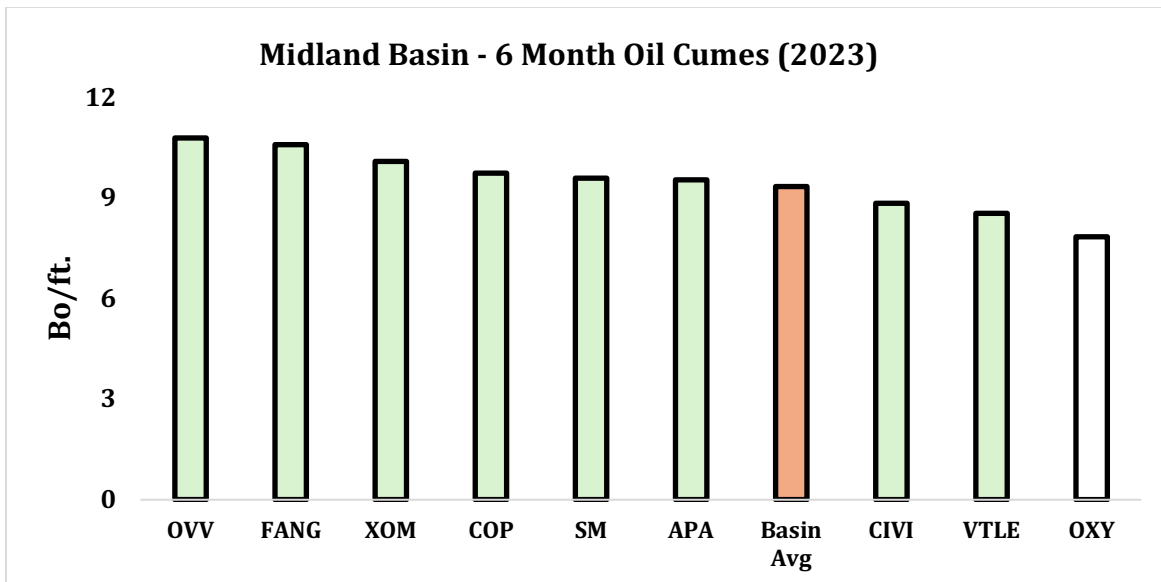
This further adds to the fact that there are signs of improvement as Occidental has beaten expectations with regards to production and as cash flow and asset sales have helped pay down debt. This is in large part due to the CrownRock acquisition which, we would like to reiterate, grants Occidental the opportunity to decrease unit production costs.

Firstly, focusing on Occidental's production profile, we would like to highlight Occidental's well productivity relative to its peers in each key U.S. shale basin (Midland, Delaware, DJ Basin, and PRB). As a whole, the company's overall well productivity is attractive and above the industry average in 2024, including a significant jump in the Midland Basin to the highest in the industry, reflecting strong well productivity from the acquired CrownRock properties. In the Delaware Basin, OXY's well productivity was the highest in the industry. To remind readers, Occidental's Lower 48 position includes franchise asset positions in the Delaware and Midland Basins of the Permian, DJ Basin, Powder River Basin, and Gulf of Mexico. The Lower 48 consists of ~83% of OXY's company-wide crude oil production and ~82% of the company's total production volumes using 2023 data. The company's Lower 48 position was strengthened through the ~\$12.0bn acquisition of CrownRock in 2024, which has meaningfully augmented the quality and inventory depth of the company's Midland Basin position, which can benefit from shared infrastructure from the Delaware. Occidentals holds a net acre position of 2.8 million acres in the Permian Basin (excluding CrownRock), 0.9 million acres in the GoM, 0.9 million acres in the DJ Basin, and >0.3 million acres in the PRB. OXY also added ~94K net acres through the CrownRock acquisition.

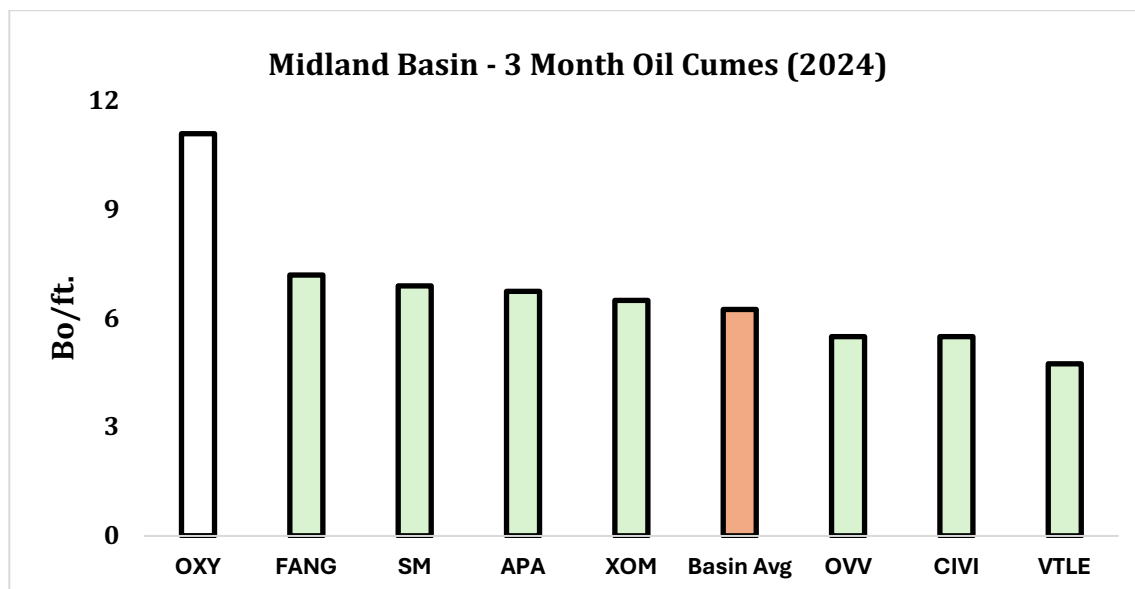
In the Permian Basin, OXY delivered ~9% of the total oil production in the basin in 2023. The company's operations in the basin consists of unconventional development of shales as well as enhanced oil recovery (EoR) programs. The company incurred \$2.8bn of capital expenditures in the basin in 2023, with 88% of total capex earmarked for unconventional drilling opportunities. In 2024, OXY has allocated \$1.7bn to the Delaware Basin, with 30% of this in secondary benches (see late Thesis 1).

To highlight Occidental's operational efficiency, we will analyze Occidental's well productivity (Bo/ft.) which measures the volume of oil produced (in barrels) per lateral foot of the well. It is a productivity metric that provides insight into how efficiently a well is producing oil over a given length. Higher values of Bo/ft indicate more productive wells. It is calculated by cumulative oil production (bbl) divided by the lateral length of the wellbore in the reservoir (ft.). This metric provides a normalized measure of well productivity, allowing operators to compare wells of different lateral lengths on an equal basis.

In this respect, we would like to underscore that in the Delaware Basin, OXY's 3-month cumulative oil in 2024 have averaged 9.3 Bo/ft., which is 11% higher than the basin average. The company's 6-month cumulative oil in 2023 averaged 16.9 Bo/ft., which exceeded the basin average by 28%. In the Midland Basin, OXY is leading the industry in oil productivity in 2024, with a 3-month cumulative of 10.9 Bo/ft., which is 71% higher than the basin average after incorporating the strong well productivity from the CrownRock properties. In 2023, the company's 6-month cumulative oil averaged 8.0 Bo/ft., which was below the basin average by 15%. In the DJ Basin, we have observed 3-month cumulative oil of 4.8 Bo/ft. in 2024 (35% above the basin average). This operational efficiency can largely be attributed to Occidental's EoR program. The two graphs below demonstrate the progress in operation efficiency Occidental has achieved in the Permian basin from 2023 to 2024:







Enhanced oil recovery (EOR), also known as tertiary recovery, is a process applied to recover oil that is not recovered under primary or secondary (waterflood) mechanisms. Primary recovery is the initial stage of the extraction process that relies on pressure differences between the surface, the wellbore, and the reservoir to force oil to the surface. Artificial lift systems are usually applied to increase the pressure differences. Secondary recovery is often applied when the reservoir pressure drops below the level for artificial lift to be effective and involves injecting water into the reservoir to increase its pressure and displace oil. Primary and secondary mechanisms typically recover less than half of the original oil in place (OOIP). As such, tertiary methods are often applied to old oil fields in an effort to further improve recovery. One of the most efficient EOR mechanisms, CO<sub>2</sub> can typically improve recovery of OOIP by an incremental 17%. In addition to increasing reservoir pressure, CO<sub>2</sub> acts as a solvent and combines with the oil before flowing to production wells. At the surface, the CO<sub>2</sub> and oil are separated so the oil can be processed for sale and the CO<sub>2</sub> can be reinjected into the ground. The vast majority of the CO<sub>2</sub> used in EOR operations is ultimately stored in the partially depleted reservoir. OXY has been flooding old oil fields on the Central Basin Platform with CO<sub>2</sub> for more than 40 years and is the largest EOR producer in the Permian Basin. The company's extensive CO<sub>2</sub> infrastructure includes 14,100 oil producing wells, 6,000 injection wells, 2,500 miles of CO<sub>2</sub> pipeline, annual CO<sub>2</sub> storage potential of 20 million tons (MMTPA) and injection capacity of 2.6 Bcfd. Most of Occidental's EOR projects are located within very large oil fields that were discovered between 1928 and 1950.

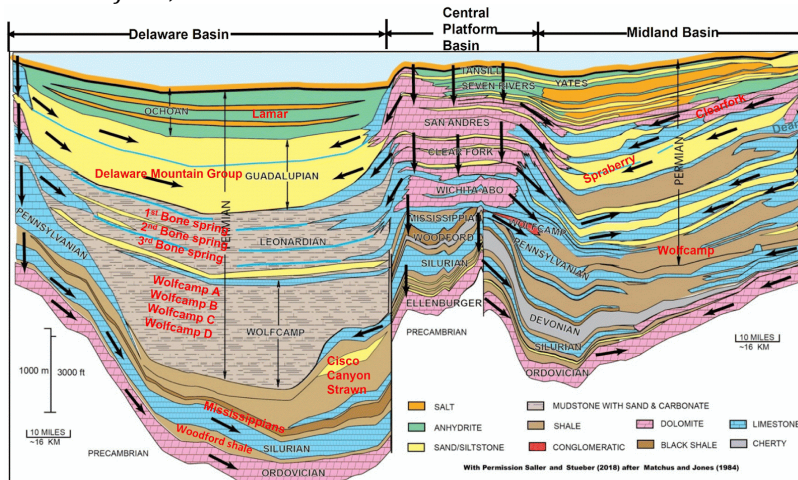
With the increased well efficiency in mind, we model increased production in near-term future years for Occidental. In our base production case, we model an increase of oil production from 640,000 bbl/d in 2023 to 690,595 bbl/d in 2024e and 797,260 bbl/d in 2025e. For natural gas, we model an increase from 1,798,000 mcf/d to a peak of 2,610,411 mcf/d in 2025e. NGLs follow the increase in oil production accordingly, where we see an increase from 282,000 bbl/d in 2023 to 350,100 bbl/d in 2024e and 403,937 bbl/d in 2025e.

Moving onto costs, we see that incrementally lower per unit cost of production will be instrumental to Occidental as, when prices and volume growth are unlikely to help grow the value (a situation the industry finds itself in currently), oil companies have only one option left: focus on improving production costs. We believe that Occidental has been, and will continue to be prudent in this regard. Admittedly, Occidental is not necessarily the current cost leader, compared to other leading Permian players. However, it has the potential to increasingly become cost-competitive as shale oil recovery rates improve (EoR is moving Occidental in this direction) and acreage is developed (CrownRock acquisition).

The key advantage that Occidental has now is their extensive acreage position in Delaware. This basin generally has deeper and more geologically complex formations and large potential reserves but also previously typically had higher extraction costs as compared to Midland. Ongoing technological advancements continue to enhance the recoverability and production efficiency in both regions, but Delaware's output due to its more complex geology is more dependent on innovation. Fortunately, such innovation has been developing at a faster pace than anyone could have expected. Occidental will be the largest beneficiary of the ongoing oilfield technological innovation, of which they are spearheading. A technology that Occidental has been developing, along with other Permian players, is horizontal drilling. Due to the larger depth and formation of the basin, Occidental has the ability to drill horizontally to produce oil from around using only one well head. It is important to note that

Permian is a stacked resource play and several oil fields can be targeted from a single vertical. Once the infrastructure is in place, the secondary benches can be drilled cost-effectively even in challenging rock.

*Cross-section of Delaware, Central Platform, and Midland Basin:*



With the above in mind, and the ability for shared infrastructure for the new acreage brought from CrownRock, we forecast incrementally lower per unit production costs. We model, in our conservative base case, (lease) operating costs decreasing from \$10.48/boe to \$8.52/boe c.2027e, transportations costs decreasing from \$3.20/boe to \$2.74/boe c.2027e and other operating expenses decreasing from \$2.81/boe to \$2.67/boe c.2027e. It is important to note that Occidental has already made substantial efforts to decrease costs, including a reduction in DD&A/boe from \$18.19/boe in 2021 to only \$13.70/boe in 2023. With a decreased need to develop infrastructure as recently acquired undeveloped acreage can utilize existing infrastructure, we model a reduction in development costs from \$4,500mm today to \$2,773mm until end of life.

With an increase in production due to operational excellence and decreased per unit production costs which will increase free cash flow, along with asset sales, we see high visibility in Occidental paying down accumulated debt. We believe that this will catalyze investors to view Occidental beyond the burn of the Anadarko acquisition and reconsider Occidental as a concentrated Permian player which has a strong production profile which will then allow them OXY to increase incremental share buybacks and to return further capital to shareholders.

**2. DAC and CCUS to provide longer dated upside: Current investor skepticism regarding falling oil prices, as well as broader macroeconomic concerns, overlook the option value of Occidental’s position in the rapidly growing DAC and CCUS segment which we believe will provide a longer dated upside for Occidental.**

Carbon capture, use, and storage (CCUS) is a vital technology to mitigate carbon emissions and climate change. The CCUS process involves capturing, compressing, and transporting large amounts of carbon to sites where it is either used in a manufacturing process, enhanced oil recovery, or is permanently stored.

The adoption of carbon capture has been slowed by large capital investment requirements, limited use, and uncertainty around the commercial viability. Despite these challenges, the business has been gaining traction. Over the last decade, carbon capture deployment has tripled although projects remain concentrated in North America and, to a lesser extent, Northwestern Europe. Very few projects are located in other parts of Europe, the Middle East, Africa, and Asia. Likewise, new projects in the planning stage are also dominated by North America and Northwestern Europe.

Like most of its competitors, OXY has improved its operational and process efficiencies by reducing flaring and fugitive emissions and implementing greenhouse gas (GHG) monitoring and control systems. However, unlike most of its peers, the company is positioned to leverage 50+ years of carbon management experience to be a leader in CO2 capture and storage. In 2018, it launched Oxy Low Carbon Ventures (OLCV) within the company’s midstream and marketing segment. OLCV is a business unit dedicated to developing sustainable solutions for reducing global GHG emissions. These include technologies for the low-carbon manufacturing of biofuels, chemicals, and concrete.

Occidental is currently investing \$600mm in CCUS through EoR and Direct Air Capture (DAC) projects. These projects provide longer-term growth potential, but include fairly meaningful near-term investments. The initial DAC projects are expected to

deliver low returns due to the unit economics with procuring carbon from the atmosphere; however, they have the potential to massively scale returns over time.

As such, we see that Occidental is building on its experience of utilizing CO<sub>2</sub> for EOR to pioneer a new business model based on scaling essential decarbonization technologies. From the Oxy Low Carbon Ventures subsidiary making select investments along the carbon capture value chain, the joint venture development company 1PointFive is building the company's first large-scale direct air capture plant in the Permian Basin (which will be the largest DAC facility in the world). Stratos should begin generating revenue from selling carbon dioxide removal credits and 45Q tax credits by mid-2025, with 1PointFive targeting 100 DAC plants in the US and with international partners by 2035, and licensing its technology to third parties longer term. Occidental is also developing large-scale CO<sub>2</sub> storage hubs for industrial emitters and other low carbon products to drive growth.

To realize the upside that Occidental's investments in DAC and CCUS technology could bring, one must understand the future of these fields. While the potential global storage capacity of carbon capture use and sequestration (CCUS) projects is projected to surge 5-fold over the next 5 years to 265 million metric tons of carbon per year (MMTPA), it remains well short of the International Energy Agency's (IEA) 2030 target of 1,300 MMTPA to put the world on a path to net-zero emissions. Moreover, this figure will need to grow to 5,600 MMTPA by 2050. The Intergovernmental Panel on Climate Change (IPCC) estimates the point source carbon capture needed by 2050 at an even higher level of 7,500 MMTPA.

OXY plans to leverage its 50+ years of carbon management experience to achieve net zero emissions (net-zero oil) in its operations and energy-use (Scope 1, 2 and 3) by 2040 and in total emissions from its sold products by 2050. Management envisions the company creating solutions and products from CO<sub>2</sub> emissions. The company's Oxy Low Carbon Ventures (OLCV) business unit is dedicated to advancing cutting-edge technology CCUS solutions. This includes the world's largest direct air capture (DAC) and storage facility, which is under construction and expected to be commercially operational in mid-2025.

#### *Occidental's DAC critical in achieving net-zero:*

In its Net Zero Emissions by 2050 report, the IEA estimates that DAC will need to be scaled up to more than 85 MMTPA by 2030 and to 980 MMTPA by 2050. Other studies suggest DAC will need to be scaled to much greater levels than the IEA's 2050 estimate. The Intergovernmental Panel on Climate Change (IPCC), for example, estimates that up to 20,000 MMTPA will need to be removed via DAC to limit global warming to 1.5 degree C by 2050. Direct air capture extracts CO<sub>2</sub> directly from the atmosphere where it comprises only 0.04% of the ambient air. In the process, CO<sub>2</sub> is captured from the air when it comes in contact with either a liquid solvent or a solid sorbent before it is liberated with heat. The CO<sub>2</sub> is then transported for use or storage while the solvent or sorbent is recycled back into the system.

#### *Occidental to commercialize DAC and CCUS:*

In 2020, OLCV formed 1PointFive to commercialize CE's DAC technology at an industrial scale. The two companies are in the process of constructing STRATOS, the world's largest DAC facility with capacity to capture 1 MMTPA of CO<sub>2</sub>. Located in the Permian Basin, the project can sequester the CO<sub>2</sub>, use it in EOR, or use it for making carbon-neutral fuels.

CE's technology uses giant fans to pull air into contractors (large structures modeled off industrial cooling towers). There the air contacts a potassium hydroxide solution on thin plastic surfaces. The solution binds with the CO<sub>2</sub> and traps it in a carbonate salt. A series of chemical solutions then increase the CO<sub>2</sub> concentration. A pellet reactor, a large structure adapted from water treatment technology, separates the salt in the form of small pellets from the solution. The pellets are heated in a calciner at temperatures as high as 900°C, to release the CO<sub>2</sub> in a pure gas form. The processed pellets are hydrated in a slaker and recycled back into the potassium hydroxide solution. This procedure provides a baseline level of competitive differentiation from amine-based systems (e.g., Climeworks), which is the current industry standard, by having a chemical-looping process that is more robust and less prone to degradation compared to amine-based solutions, which can oxidize or degrade in the presence of oxygen. Furthermore, OXY's industrial process is more modular, allowing for large-scale deployment as compared to amine-based procedures.

CE's aqueous sorbent design allows the plant to be built using cheap cooling tower hardware and to operate continuously compared to solid sorbent facilities that require very large structures that must be periodically sealed from ambient air during the regeneration step. Equally important, the liquid surface of the sorbent is continually renewed in CE's process, leading to a long life versus solid sorbents that typically last less than five years. 1PointFive will generate 45Q tax credits that OXY can sell to other companies, which will be the initial revenue generated by STRATOS.

The Inflation Reduction Act (IRA) of 2022 increased the value of the credit again to \$50/T for EOR, \$85/T for geologic storage, \$130/T for DAC with CO<sub>2</sub> usage (including EOR) and \$180/T for DAC with permanently stored CO<sub>2</sub>. The IRA also lowered the capacity requirements to 18,750 TPA for power plants, 1,000 TPA for DAC, and 12,000 TPA for all other facilities. The

legislation also extended the qualifying period for credits by 7 years to 2023. The tax credit is intended for the owner and operator of the CCS equipment. However, partners and investors can share credits.

Importantly, Occidental has already signed contracts and entered into agreements with numerous companies from around the globe to commercialize their DAC technology. For example, Occidental's status as a first mover in this market has helped them secure multi-year carbon removal credit contracts with large enterprises such as Airbus (4-Year, 400K tons), Amazon (10-Year, 250K tons), and Microsoft (6-Year, 500K tons). These high-profile contracts indicate trust in Occidental's DAC capabilities and its ability to deliver verifiable carbon removal at scale, while also offering OXY a more predictable and steady revenue stream than relying on commodity prices. Additionally, with OXY being a first mover in the DAC market, which is still in its infancy, will allow the company to help share standards pricing, and policies for the future carbon removal economy for years to come.

All in all, OXY's greatest strength is its ability integrate DAC into its CCUS framework, leveraging its experience in CO2 handling and EOR to enhance the value of captured carbon. Instead of purchasing CO2 from suppliers like Kinder Morgan, which can amount to ~\$25/ton, DAC provides a self-sustaining and scalable CO2 supply. As a result, we see longer-dated returns with OXY monetizing DAC and CCUS through tax credits, LCFS credits, EOR profits, and carbon removal contracts.

### DAC Build:

Year	[Units]	Historical Period											Forecast Period										
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	
<b>DAC</b>																							
Revenues		-	-	-	-	-	-	-	-	-	-	-	651	1,085	1,736	2,821	4,340	5,859	7,595	9,331	11,284	14,105	
% growth		-	-	-	-	-	-	-	-	-	-	-	-	66.67%	60.00%	62.50%	53.85%	35.00%	29.63%	22.86%	20.93%	25.00%	
Costs		-	-	-	-	-	-	-	-	-	-	-	525	856	1,338	2,123	3,189	4,200	5,308	6,354	7,482	9,100	
% revenue		-	-	-	-	-	-	-	-	-	-	-	80.65%	78.85%	77.06%	75.27%	73.48%	71.68%	69.89%	68.10%	66.31%	64.52%	
<b>DAC Assumptions</b>																							
Price per Ton (EOR use)													-	130	130	130	130	130	130	130	130	130	
Price per Ton (Storage use)													-	180	180	180	180	180	180	180	180	180	
Estimated Cost per Ton													-	250	244	239	233	228	222	217	211	206	
Total Plants													-	3	5	8	13	20	27	35	43	52	
Total Production (est. 1M tons per plant)													-	2100	3500	5600	9100	14000	18900	24500	30100	36400	
<b>Production Efficiency</b>																							
Base													-	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	70.00%	
Bull													-	85.00%	85.00%	85.00%	85.00%	85.00%	85.00%	85.00%	85.00%	85.00%	
Bear													-	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	

## Investment Risks

### 1. Volatile global and local commodity prices greatly impact Occidental's financial and operational results.

Occidental's financial results correlate closely to the prices it obtains for its products, particularly oil and, to a lesser extent, NGL, natural gas and its chemical products. Prices for oil, NGL and natural gas fluctuate widely. Historically, the markets for oil, NGL and natural gas have been volatile and may continue to be volatile in the future. If the prices of oil, NGL or natural gas continue to be volatile or decline, Occidental's operations, financial condition, cash flows, level of expenditures and the quantity of estimated proved reserves that may be attributed to its properties may be materially and adversely affected. Prices are set by global and local market forces which are not in Occidental's control. These factors include, among others:

- i. Worldwide and domestic supplies of, and demand for, oil, NGL, natural gas and refined products;
- ii. The cost of exploring for, developing, producing, refining and marketing oil, NGL, natural gas and refined products;
- iii. Operational impacts such as production disruptions, technological advances and regional market conditions, including
- iv. available transportation capacity and infrastructure constraints in producing areas;
- v. Changes in weather patterns and climate;
- vi. The impacts of the members of OPEC and non-OPEC member-producing nations that may agree to and maintain
- vii. The ongoing global impact of the Russia-Ukraine war and conflicts in the Middle East;
- viii. The worldwide military and political environment, including uncertainty or instability resulting from an escalation or outbreak of armed hostilities; and
- ix. Other factors that impact oil markets

However, such risks are not idiosyncratic to Occidental, and incremental deleveraging of the balance will help Occidental manage oil downturns.





*Acreage & Other Segments:*

Acreage			
<b>United States</b>			
Developed			
Gross	[acres]		6,151
Net	[acres]		3,936
Undeveloped			
Gross	[acres]		1,114
Net	[acres]		743
Fee mineral ownership			
Gross	[acres]		8,070
Net	[acres]		4,582
<b>International</b>			
Developed			
Gross	[acres]		1,249
Net	[acres]		462
Undeveloped			
Gross	[acres]		8,070
Net	[acres]		4,582
<b>Undeveloped Acreage Valuation</b>			
Value per acre, United States	[\$]		\$ 10,000.00
Value per acre, International	[\$]		\$ 500.00
Acreage value, United States	[\$mm]	\$	7,430.00
Acreage value, International	[\$mm]	\$	2,291.00
<b>Total acreage value, net</b>	<b>[\$mm]</b>	<b>\$</b>	<b>9,721.00</b>
<b>Chemicals</b>			
2023 EBITDA	[\$mm]		1,887
Target EV/EBITDA	[x]		9.00x
<b>Estimated Value</b>	<b>[\$mm]</b>	<b>\$</b>	<b>16,983.00</b>
<b>Marketing &amp; Midstream</b>			
2023 EBITDA	[\$mm]		350
Target EV/EBITDA	[x]		8.00x
<b>Estimated Value</b>	<b>[\$mm]</b>	<b>\$</b>	<b>2,800.00</b>

*Net Asset Value:*

Net Asset Value		
<b>Enterprise Value</b>		
Proven Reserves	[\$mm]	\$ 51,827.89
Acreage	[\$mm]	\$ 9,721.00
Chemicals	[\$mm]	\$ 16,983.00
Marketing & Midstream	[\$mm]	\$ 2,800.00
<b>Total Enterprise Value</b>	<b>[\$mm]</b>	<b>\$ 81,331.89</b>
<b>Less: Balance sheet adjustments</b>		
Current portion of long-term debt	[\$mm]	(1,202)
Short-term debt	[\$mm]	-
Long-term debt	[\$mm]	(17,799)
Noncontrolling interest	[\$mm]	(99)
Cash & equivalents	[\$mm]	1,447
Equity investments	[\$mm]	3,224
Pension liabilities	[\$mm]	(147)
Operating leases	[\$mm]	-
Capital leases	[\$mm]	(737)
Preferred stock	[\$mm]	(8,914)
<b>Equity Value</b>	<b>[\$mm]</b>	<b>\$ 57,104.69</b>
Fully diluted shares outstanding	[mm]	953.1
<b>Implied NAV per Share</b>	<b>[\$/sh.]</b>	<b>\$ 59.91</b>

*NAV Commodity Price & Operational Scenarios Sensitivities:*

Operational Scenario					
	Bear	Base	Bull		
Commodity Scenario	1	\$34.33	\$41.88	\$45.45	
	2	\$46.74	\$53.86	\$57.09	
	3	\$53.45	\$61.17	\$64.71	
	4	\$60.16	\$68.49	\$72.34	
	5	\$83.91	\$90.17	\$92.88	
Operational Scenario					
	Bear	Base	Bull		
Commodity Scenario	1	-31.34%	-16.24%	-9.10%	
	2	-6.52%	7.72%	14.18%	
	3	6.90%	22.34%	29.42%	
	4	20.32%	36.98%	44.68%	
	5	67.82%	80.34%	85.76%	



Debt Schedule:

Year	2023	2024	2025	2026	2027	2028	2029
<b>Cash Flow from Operations</b>	12,308	12,377	12,756	11,473	11,562	11,466	11,187
(-) CapEx	(6,270)	(5,616)	(5,991)	(5,368)	(5,570)	(5,814)	(6,036)
<b>Levered Free Cash Flow</b>	6,038	6,760	6,765	6,106	5,992	5,651	5,151
Beginning Cash Balance	1,426	14,410	18,909	20,108	23,838	27,826	30,365
(+) Levered Free Cash Flow	6,038	6,760	6,765	6,106	5,992	5,651	5,151
(-) Minimum Cash Balance	(500)	(500)	(500)	(500)	(500)	(500)	(500)
<b>Total Cash Available for Debt Repayment</b>	6,964	20,671	25,174	25,714	29,330	32,977	35,016
<b>OXY Weighted Senior Notes</b>							
New Issuances	-	6,244	-	-	-	-	-
Beginning Balance	-	22,984	20,684	19,476	18,140	16,835	16,257
(-) Repayment	-	(2,300)	(1,208)	(1,336)	(1,305)	(578)	(1,486)
Ending Balance	16,740	20,684	19,476	18,140	16,835	16,257	14,771
Current Portion	1,056	1,208	1,336	1,305	578	1,486	2,449
Long-Term Portion	15,684	19,476	18,140	16,835	16,257	14,771	12,322
Interest Rate	-	5.72%	5.72%	5.72%	5.72%	5.72%	5.72%
Interest Expense	-	1,314	1,183	1,113	1,037	962	929
<b>OXY Weighted Debenture Notes</b>							
Beginning Balance	-	1,128	1,128	1,128	1,016	818	490
(-) Repayment	-	-	-	(112)	(198)	(328)	(367)
Ending Balance	1,128	1,128	1,128	1,016	818	490	123
Current Portion	-	-	112	198	328	367	-
Long-Term Portion	1,128	1,128	1,016	818	490	123	123
Interest Rate	-	7.53%	7.53%	7.53%	7.53%	7.53%	7.53%
Interest Expense	-	85	85	85	76	62	37
<b>OXY Bond (Variable Rate - 5.75% as of Dec. 31st)</b>							
Beginning Balance	-	68	68	68	68	68	68
(-) Repayment	-	-	-	-	-	-	-
Ending Balance	68	68	68	68	68	68	68
Current Portion	-	-	-	-	-	-	68
Long-Term Portion	68	68	68	68	68	68	-
Interest Rate	-	5.75%	5.75%	5.75%	5.75%	5.75%	5.75%
Interest Expense	-	4	4	4	4	4	4
Years Until Repayment	6	5	4	3	2	1	-
<b>OXY Credit Agreement 364-Day Term Loan</b>							
Beginning Balance	-	2,000	300	-	-	-	-
(-) Mandatory Repayment	-	-	(300)	-	-	-	-
(-) Optional Repayment	-	(1,700)	-	-	-	-	-
Ending Balance	-	300	-	-	-	-	-
Current Portion	-	300	-	-	-	-	-
Long-Term Portion	-	-	-	-	-	-	-
Interest Rate	-	6.12%	5.27%	-	-	-	-
Interest Expense	-	122	16	-	-	-	-
Term	-	1	2	-	-	-	-
<b>OXY Credit Agreement 2-Year Term Loan</b>							
Beginning Balance	-	2,700	2,700	2,700	-	-	-
(-) Mandatory Repayment	-	-	-	(2,700)	-	-	-
(-) Optional Repayment	-	-	-	-	-	-	-
Ending Balance	-	2,700	2,700	-	-	-	-
Current Portion	-	-	2,700	-	-	-	-
Long-Term Portion	-	2,700	-	-	-	-	-
Interest Rate	-	5.87%	5.02%	4.94%	-	-	-
Interest Expense	-	158	136	133	-	-	-
Term	-	1	2	3	-	-	-
<b>Total Interest Expense</b>		1,684	1,423	1,336	1,117	1,028	970
<b>Discount and Deferred Financing Costs</b>		111	111	111	111	111	111
<b>Total Debt Paydown</b>		(4,000)	(1,508)	(4,148)	(1,503)	(906)	(1,853)
<b>Total Debt Issuance</b>		-	-	-	-	-	-
<b>Total Current Portion of Debt</b>		1,508	4,148	1,503	906	1,853	2,517
<b>Total Long-Term Debt</b>		25,483	22,335	20,532	16,926	15,073	12,556
<b>Total Debt</b>		26,991	26,483	22,035	17,832	16,926	15,073
<b>Cost of Financing Schedule</b>							
SOFRA Assumptions		4.62%	3.77%	3.69%	3.66%	3.65%	3.71%
Weighted Average (Senior Notes)		5.72%	5.72%	5.72%	5.72%	5.72%	5.72%
Weighted Average (Debenture)		7.53%	7.53%	7.53%	7.53%	7.53%	7.53%

## Discounted Cash Flows (Base Case):

### DCF:

Occidental Petroleum (NYSE: OXY)																		
Discounted Cash Flows																		
(USD, Thousands)																		
Case:	2																	
	Historical Period										CAGR	Forecast Period			CAGR			
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	(14' - 23')	2024E	2025E	2026E	2027E	2028E	2029E	(24' - 29')
Net Sales	19,312	12,480	10,090	12,508	17,824	20,393	17,809	25,956	36,634	28,257	4.32%	32,590	34,864	31,332	32,610	34,136	35,545	1.75%
% growth		-35.38%	-19.15%	23.96%	42.50%	14.41%	-12.67%	45.75%	41.14%	-22.87%		15.3%	7.0%	(10.1%)	4.1%	4.7%	4.1%	
EBITDA	5,562	(4,993)	2,715	5,318	9,643	6,627	(6,131)	13,013	20,963	13,705	10.54%	16,906	17,031	14,598	14,937	15,173	15,136	-2.19%
% margin	28.80%	-40.01%	26.91%	42.52%	54.10%	32.50%	-34.43%	50.13%	57.22%	48.50%		51.88%	48.85%	46.59%	45.81%	44.45%	42.58%	
EBIT	1,301	(9,537)	(1,553)	1,316	5,666	646	(14,228)	4,566	14,037	6,840	20.25%	9,656	9,274	7,628	7,682	7,578	7,228	-5.63%
% margin	6.7%	(76.4%)	(15.4%)	10.5%	31.8%	3.2%	(79.9%)	17.6%	38.3%	24.2%		29.6%	26.6%	24.3%	23.6%	22.2%	20.3%	
Taxes	1,685	(1,330)	(662)	17	1,477	693	(2,172)	915	813	1,733		1,674	1,649	1,321	1,379	1,376	1,314	
NOPAT/EBIAT	(384)	(8,207)	(891)	1,299	4,189	(47)	(12,056)	3,651	13,224	5,107	33.31%	7,981	7,625	6,306	6,304	6,203	5,914	-5.82%
Plus: Depreciation & Amortization	4,261	4,544	4,268	4,002	3,977	5,981	8,097	8,447	6,926	6,865		7,251	7,757	6,971	7,255	7,595	7,908	
Less: Capital Expenditures	(8,930)	(5,272)	(2,717)	(3,599)	(4,975)	(6,355)	(2,535)	(2,870)	(4,497)	(6,270)		(5,616)	(5,991)	(5,368)	(5,570)	(5,814)	(6,036)	
Less: Increases in Net Working Capital	1,031	976	135	95	(1,717)	1,819	6	(1,088)	1,134	(590)		(590)	(3)	4	(2)	(2)	(2)	
Unlevered Free Cash Flow	(4,022)	(7,959)	795	1,797	1,474	1,398	(6,488)	8,140	16,787	5,112	2.70%	9,026	9,389	7,913	7,987	7,981	7,784	-2.92%
WACC	7.44%																	
Discount Period (mid-year)											0.110	0.710	1.710	2.710	3.710	4.710		
Discount Factor											0.992	0.950	0.885	0.823	0.766	0.713		
PV of Unlevered Free Cash Flow											8,956	8,923	7,000	6,575	6,116	5,552	-9.12%	

Implied Enterprise Value		Implied Equity Value & Share Price		Implied Perpetuity Growth Rate	
Sum of near-term PV unlevered free cash flows	43,121	Implied Enterprise Value	86,304	Terminal year (2028) FCF	7,981
Terminal Value		Less: Balance sheet adjustments	(24,227)	WACC	7.44%
Terminal year (2029E) EBITDA	15,136	Implied Equity Value	62,077	Terminal Value	60,546
Exit Multiple	4.0x	Fully diluted shares outstanding (mm)	953.1	Implied Perpetuity Growth Rate	(4.65%)
Terminal Value	60,546	Implied Share Price	\$ 65.13	Implied Upside	28.97%
Discount Factor	0.71				
Present value of Terminal Value	43,183				
% of Enterprise value	50.04%				
Implied Enterprise Value	86,304				

### DCF Sensitivity:

DCF Sensitivity: Exit Multiple and WACC								
		Exit Multiple						
		2.50x	3.00x	3.50x	4.00x	4.50x	5.00x	5.50x
WACC	5.94%	51.38	57.43	63.48	69.53	75.58	81.63	87.68
	6.44%	50.27	56.19	62.11	68.03	73.95	79.86	85.78
	6.94%	49.19	54.98	60.77	66.56	72.35	78.14	83.93
	7.44%	48.14	53.80	59.47	65.13	70.79	76.46	82.12
	7.94%	47.11	52.65	58.20	63.74	69.28	74.82	80.36
	8.44%	46.11	51.53	56.95	62.37	67.80	73.22	78.64
	8.94%	45.13	50.43	55.74	61.05	66.35	71.66	76.96

## WACC Calculation:

### WACC and Beta Calculation:

Occidental Petroleum (WACC)									
Weighted Average Cost of Capital									
(USD, millions)									
<b>WACC Calculation</b>		<b>Comparable Companies Beta</b>							
Total Debt	20,911	Company	Ticker	Predicted Beta	Total Debt	Market Value of Equity	Debt/Equity	Tax Rate	Unlevered Beta
Total Equity	30,349	Name	Symbol	Beta	Debt	of Equity	Equity	Rate	Beta
Debt to total capitalization	40.79%	EOG Resources	EOG-US	0.88	4,114.0	76,907.0	5.35%	21%	0.84
Equity to total capitalization	59.21%	Diamondback Energy	FANG-US	0.90	12,923.0	52,831.7	24.46%	21%	0.75
<b>Cost of Debt</b>		Permian Resources A	PR-US	1.01	4,313.7	12,645.3	34.11%	21%	0.80
Pre-tax cost of debt	5.72%	Ovintiv	OVV-US	1.02	6,775.0	11,927.8	56.80%	21%	0.70
Tax rate	21%	APA	APA-US	0.82	6,470.0	8,141.7	79.47%	21%	0.50
After-tax cost of debt	4.52%	Matador Resources	MTDR-US	1.10	3,596.2	7,244.6	49.64%	21%	0.79
<b>Cost of Equity</b>		SM Energy	SM-US	1.21	2,706.7	5,087.5	53.20%	21%	0.85
Risk-free rate	4.394%	Average		0.99			0.43		0.75
Equity market risk premium	4.60%	Median		1.01			0.50		0.79
Levered Beta	1.10	<b>Occidental Petroleum Levered Beta</b>							
Cost of Equity	9.45%	Mean Unlevered Beta		0.79	Target Debt/Equity		49.64%	Tax Rate	21.00%
WACC	7.44%	Relevered Beta							1.10



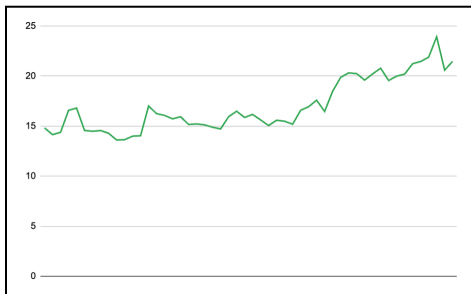
# Catalyst Pharmaceuticals (NASDAQ: CPRX)

Catalyst Pharmaceuticals   NASDAQ: CPRX		
Negative	Neutral	Positive
Share price, 11/28/24:		\$22.34
Market capitalization:		\$2,664mm
Shares outstanding:		119.27mm
52-week range:		\$13.00/\$24.27
EPS (FY23):		\$0.63
Beta:		1.12
Average analyst opinion:		\$32.00-36.00
Price target:		\$36.55

## Investment Overview

Catalyst is a pharmaceutical company providing three specific rare-disease drugs currently to the American market. We believe consensus pessimism in Catalyst's ability to successfully acquire and expand their drug portfolio, while strengthening their current financial position, presents an unique opportunity to invest. With a price target of \$36.55, we recommend a BUY for CPRX.

## 1-Year Price Chart (12/1/23 – 11/28/24)



## Company Overview

### Company History

Catalyst Pharmaceuticals, Inc. was founded in 2002 and is based in Coral Gables, Florida. It is a commercial-stage biopharmaceutical company, and focuses on developing and commercializing therapies for people with rare debilitating, chronic neuromuscular, and neurological diseases in the United States. They exclusively focus on rare central nervous system and adjacent diseases, making them a unique pharmaceutical company with minimal direct competition.

## Financial Highlights

(Dollars in millions)	2021	2022	2023
Revenue	141	214	398
% Growth	18.27%	52.10%	85.90%
EBIT	52	102	87
% Payout	37.07%	47.47%	21.74%
EPS	\$0.37	\$0.75	\$0.63

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## Business Model

Catalyst generates revenue through the sale of three commercial drugs: FIRDAPSE, FYCOMPA, and AGAMREE.

### FIRDAPSE

Launched by Catalyst in January 2019, Firdapse is the only FDA-approved drug to treat LEMS (Lambert-Eaton myasthenic syndrome) for patients over 6 years old and Catalyst has exclusive production rights for it in North America. LEMS is an ultra-rare autoimmune disorder characterized by muscle weakness of the limbs. While there are only about 400 known cases of LEMS in the US, the true number of patients affected by it is estimated to be significantly higher (since many might remain undiagnosed). Worldwide, the number of LEMS patients is estimated to be around 23,000 (2.8 patients per million people). Catalyst recently secured patents to provide intellectual property protection to Firdapse through



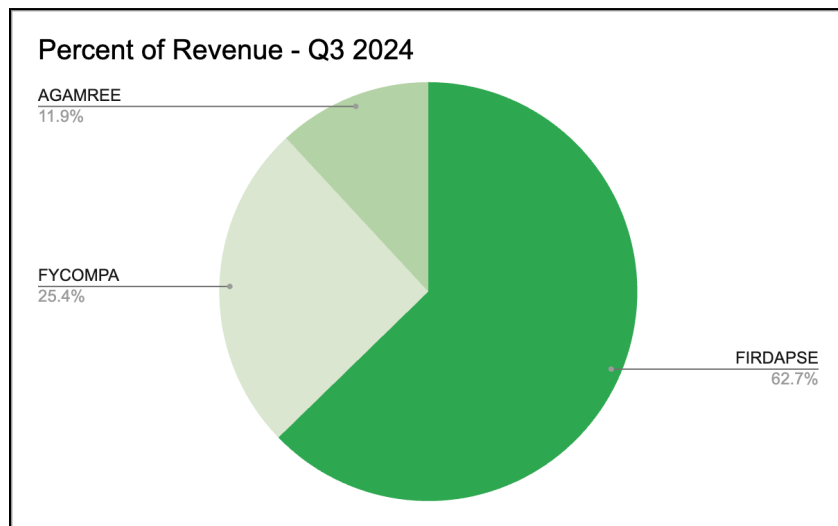
2024. The sale of FIRDAPSE formed around 63% of Catalyst’s revenue in both Q2 and Q3 of 2024.

### **FYCOMPA**

FYCOMPA is prescription medicine used to treat: 1) partial-onset seizures with or without secondarily generalized seizures in people with epilepsy aged 4 and older and 2) to treat primary generalized tonic-clonic seizures in people with epilepsy aged 12 and older. Catalyst acquired exclusive rights to FYCOMPA in Q1 2023, and began selling it in the US in May 2023. The patent protecting FYCOMPA’s intellectual property expires on May 23, 2025. However, Catalyst already has a settled contract with the patent’s parent company to maintain the patent on a yearly basis even after its expiration. The sale of FYCOMPA formed 29.79% of Catalyst’s revenue in Q2 and 25.4% in Q3 of 2024.

### **AGAMREE**

AGAMREE is a prescription medicine used to treat Duchenne Muscular Dystrophy (DMD) in patients 2 years and older. Catalyst acquired the rights to AGAMREE in July 2023 with a \$75M payment to Santhera Pharmaceuticals in return for the exclusive North American license for AGAMREE, and an additional \$36M payment in October 2023. DMD is a life-threatening neuromuscular disorder characterized by progressive muscle dysfunction. While rare overall, it is still the most common form of muscular dystrophy (affecting approx. 15,000 people in the US and 300,000 globally). The company recently launched AGAMREE in the US on March 13 2024. The sale of AGAMREE formed 7.13% of Catalyst’s revenue in Q2 and 11.9% in Q3 of 2024.



## Industry Overview

The U.S. pharmaceutical industry is characterized by high competition and constant innovation. Drug development and sales are at the core of pharmaceutical companies’ business, with companies constantly striving to develop novel drug treatments and decrease their costs associated with manufacturing. Companies will also often make it an objective to decrease unit costs of production of each drug to gain pricing advantages over their competitors operating in the same disease sector.

In order to be sold to the public, a drug must receive approval from the FDA, indicating it meets safety and effectiveness requirements for the population demographics it targets. To achieve this, companies undergo an extensive process, beginning with literature research and preclinical studies, followed by various phases of clinical trials in which the drug is tested among different patient populations. After a drug is approved by the FDA, a company can apply for further approval if they aim to change the usages of a drug – targeting a broader age range, changing the suggested dosage, etc. This process can take years, if not decades, for a singular drug.

The pharmaceutical industry can be segmented by diseases treated in niche areas, although this is an imperfect system since larger companies may have multiple drugs and many drugs can treat multiple concerns. These segments can range from being multi-billion dollar sub-industries (COVID-19, various cancers), to more niche markets like LEMS, reported to have a market size of just under \$100 million USD as of 2024.

## Expanded Total Addressable Market

Competition in the pharmaceutical industry is dependent on a company’s costs of production and the exclusivity/patent rights to their products. A company must consider whether they manufacture generic or brand name drugs for a particular disease, which depends upon conditions such as saturation of that disease market and the patent protection situation of its competitors. Pharmaceutical companies will generally reinvest their earnings into R&D and M&A activities (the former having risen tremendously for Catalyst from 2022 to 2023).

Catalyst manufactures three drug products and faces competition in each of those segments. A few notable competitors Catalyst has faced include Jacobus Pharmaceuticals and Sarepta Therapeutics. Jacobus Pharmaceuticals had been competing with Catalyst for market share in the LEMS market with its RUZURGI drug product, a treatment indicated for pediatric patients aged 6-17. A court ruling in May 2021 found RUZURGI to have violated Catalyst’s exclusivity rights for FIRDAPSE, due to the two having the same active ingredient. RUZURGI’s FDA approval was revoked, and Catalyst subsequently acquired the rights to RUZURGI, ensuring further stability in its position within the LEMS market. This legal dispute highlights the importance of patent and exclusivity protection, especially in niche markets like LEMS where one company may have a significant first-mover advantage.

Sarepta Therapeutics competes with Catalyst in the DMD field, where Sarepta’s Elevidys was FDA-approved in June 2023 in an accelerated program, due to a critical unmet medical treatment criteria. Catalyst’s AGAMREE has yet to produce robust financials (as it became a public product in March 2024), but its novel biological mechanisms – proven to reduce side effects that other drugs share in common – as well as newly acquired patent protections render it a promising competitor in yet another niche market.

**Santhera’s Partner Catalyst Pharmaceuticals Launches AGAMREE® (Vamorolone) in the United States**

March 14, 2024 | 5 min read

**Court Says FDA Unlawfully Infringed on Catalyst Orphan Drug Exclusivity with Ruzurgi Approval**

January 25th 2023

## Key Players - Landscape

Three key players on a similar market cap level and in similarly niche spaces are Zai Lab, Acadia Pharmaceuticals, and Agios Pharmaceuticals. All three of these companies are able to leverage significant R&D and treatment in one or a few

niche diseases that are increasing in likelihood and thus providing a chance for increasing market share and market scope growth.

Zai Lab competes with global pharmaceutical companies in the oncology and autoimmune space, leveraging its robust pipeline of innovative therapies. Its most notable product, Zejula, has gained traction in China, positioning Zai Lab as a key player in the fight against ovarian cancer.

Acadia Pharmaceuticals is primarily focused on neuroscience and got FDA approval for its flagship drug Nuplazid in 2016 for Parkinson's disease psychosis. Through its expanded label for Rett syndrome, Acadia is broadening its neurological portfolio. Agios Pharmaceuticals, specializing in rare genetic diseases and cancer metabolism, achieved FDA approval for Pyrukynd in 2022 for adults with pyruvate kinase deficiency.

Agios is advancing research in rare hematological diseases, fortifying its position in a unique therapeutic market. Specifically, it is exploring mitapivat therapies for hemolytic anemias, potentially expanding its reach in the rare disease landscape and solidifying its leadership in cellular metabolism.

## Investment Theses

**Thesis 1: Improvements in diagnosis mechanisms and disease awareness is set to increase FIRDAPSE's stronghold in an expanding LEMS market, positioning it attractively to take more market share or experience potential acquisition for a premium.**

FIRDAPSE, Catalyst's highest source of revenue in 2023 (roughly  $\frac{2}{3}$  of all sales), is the only FDA-approved medication used to treat Lambert-Eaton myasthenic syndrome (LEMS). Intended as a longer term treatment (subject to doctor's orders), we believe Catalyst's role as the sole manufacturer of an FDA-approved LEMS treatment positions it well to capture any increase in market size in a growing LEMS market, as well as potentially be acquired by a larger pharmaceutical company for a notable premium.

The LEMS disease treatment market is expected to grow at a CAGR of roughly 6% for the next 5-7 years, largely driven by increases in immunotherapy research, increasing awareness of the underdiagnosis of the disease, and a growing number of cases worldwide. Though the risk exists that the TAM for LEMS disease treatment is not going to grow higher due to a small population affected by the disease (roughly 1 in 2.8 million people worldwide), we believe that these estimated numbers are low due to similarities with other neuromuscular diseases and association with SCLC, making it hard to distinguish symptoms between being attributable to LEMS or being a side effect of the cancer (often, the former goes unnoticed). In 50-60% of SCLC cases, the body's immune system will mistakenly attack healthy nerve endings instead of immune cells, causing the onset of LEMS and prompting the neuromuscular junction to lose its regular function. Though the exact causality between SCLC and LEMS is not completely known, recent developments in biological research have indicated improved measures of LEMS diagnosis; a study published in March 2024 details that seropositive SOX-1 antibodies, which are associated with SCLC and LEMS, was found to be present in 65% of SCLC LEMS patients and only in 5% of non-SCLC LEMS patients, results that show the possibility and drive the market objective of improving diagnostics of LEMS.

Advancements in other diagnostic techniques, such as serological testing (improving the sensitivity and specificity for detection of VGC antibodies), as well as novel immunotherapy and ion channel treatments, similarly aim to achieve more

accurate and timelier detection of LEMS. In 2021, updates and revisions of clinical guidelines of paraneoplastic diagnostic criteria advocated for increasing investigation into multidisciplinary approaches to patient management and treatment, increasing incentive for companies to join the LEMS space and for existing companies to further R&D efforts toward improving the quality of their treatments.

We forecast that the aforementioned trends toward increased LEMS awareness, as well as improvements in the technologies needed to achieve this purpose, will serve to increase the market demand for LEMS diagnosis, paving the way for a growth and new entrants into the treatment market. Given the FDA recently increased recommended dosage from 80 to 100mg and that Catalyst recently received patents granting the company exclusive rights to FIRDAPSE IP until 2034, Catalyst is well positioned to scoop up increasing market share.

IP and exclusivity are large considerations in an expanding pharmaceutical market. With a patent cliff projected to occur in the pharmaceutical market, with an estimated \$200 billion in sales from 2024 to 2030 at risk due to losses in exclusivity and patent protections, many big pharma companies, who are financially positioned to diversify their portfolios, have set a precedent moving toward niche diseases through acquisitions. Recent examples of these acquisitions include AstraZeneca's acquisition of Alexion Pharmaceuticals – aimed toward marking the beginning of the former's efforts toward expanding into rare diseases – in a \$39 billion deal in 2021, and Amgen's acquisition of Horizon Therapeutics – aimed toward increasing the former's portfolio to encapsulate rare inflammatory diseases – in a \$27.8 billion deal in 2023. Catalyst's specialization in LEMS, a disease whose market is forecasted to grow notably over the next 5-7 years, makes it an attractive target for acquisition at a premium by a large-cap pharmaceutical company for its rare disease IP.

**Thesis 2: Catalyst's management realizes that FYCOMPA does not fit its brand identity and core operational capabilities and will choose not to renew its patent license in 2026, improving the firm's overall financial performance and providing liquidity for future operations.**

Catalyst is expected to strategically opt out of renewing the licensing agreement for FYCOMPA when its patent exclusivity expires in June 2026, marking a pivot back to its core strength: commercializing therapies for ultra-rare diseases with high barriers to entry. FYCOMPA, a drug for seizures (hence not an ultra-rare disease), has struggled to align with Catalyst's business model, which relies on efficient, targeted commercialization in niche markets with limited competition. Unlike flagship products such as FIRDAPSE and AGAMREE, which provide monopolistic market positions, FYCOMPA operates in a broader and highly competitive seizure drug market, where Catalyst has found it difficult to gain market share because marketing generic drugs is not their strongest suit (since they have otherwise exclusively operated in monopolistic markets).

This misalignment is evident in the operational strain FYCOMPA has placed on the company. To market FYCOMPA, Catalyst was forced to expand its commercial team by 35 employees in 2023, substantially increasing SG&A costs. This level of investment diverges from Catalyst's traditionally lean approach to marketing rare disease drugs, which target small, specialized physician networks. Moreover, FYCOMPA's financial performance has been underwhelming, with revenue declining by 12% year-over-year in Q3 2024 (\$32.1M vs. \$36.4M in Q3 2023). Daily revenue trends reflect a similar drop, from \$395,000 in 2023 to \$362,800 in 2024, a downward trajectory that underscores the product's diminishing market fit in the U.S. and growing competition from newer seizure treatments. Unlike Catalyst's rare disease drugs, which benefit from robust pricing power and a lack of alternatives, FYCOMPA will keep facing new entrants to the market and potentially lowering demand, likely making it increasingly unprofitable.

Catalyst has also been losing revenue potential due to the marketing programs it has had to run for FYCOMPA, including a Patient Assistance Program that provided the drug free of charge to uninsured patients who met specific criteria. While these programs reflect Catalyst's commitment to patient access, they have not been financially sustainable and further illustrate why FYCOMPA is a poor fit within the company's portfolio. FYCOMPA has additionally been the target of several Paragraph IV challenges, including one in February 2023 for its oral suspension and tablet formulations. While Catalyst successfully triggered 30-month stays by filing lawsuits and ultimately settled with the filer in June 2024, the settlement terms allow the Paragraph IV filer to commercialize its ANDA products as early as December 15, 2025. This looming competitive pressure from generics will further decrease FYCOMPA's profitability, likely rendering it too expensive to justify continued marketing efforts.

We believe Catalyst's management also recognizes this. Management's minimal commentary on FYCOMPA during earnings calls further supports this view. Unlike when FIRDAPSE underperformed in Q1 and they gave a detailed explanation as to why that could have been, Catalyst has provided little justification for FYCOMPA's poor results in 2024. This indicates that management may see the product as misaligned with their broader portfolio strategy and are signaling an intent to move on from the drug. Moreover, the company's 10-Q report for Q3, which we would expect to have offered transparency into the performance dip, clearly avoided addressing FYCOMPA's underperformance, showing that the company realizes there was no justification other than poor product-company fit.

For these reasons, we believe Catalyst will choose not to renew FYCOMPA's licensing agreement post-2026. By discontinuing the product, the company will reinforce its commitment to its core identity as a leader in ultra-rare disease treatments while freeing up resources to drive its next phase of growth through strategic acquisitions.

**Thesis 3: Catalyst has shown that it can successfully acquire novel drugs in similar niche markets to AGAMREE, and will do so soon, likely in 2026 or 2027.**

Catalyst has shown its determination in entering and capturing new rare drug markets, in a pattern of patent acquisition that enables expansion into new markets. Not only has this been exemplified through recent acquisitions, such as AGAMREE and FYCOMPA, but also through their 10K. One of the key aspects of their business strategy is explicitly to "diversify our product portfolio through acquisitions of clinically differentiated" products, especially those in "rare CNS (orphan) therapeutic categories". Further, they highlight their intentionality in the acquisitions they have made and will make in the future, with "a disciplined, comprehensive and exhaustive approach to identifying and evaluating assets". This is possible because of the expertise they have fortified through past drugs that affect the CNS, giving them a strong set of existing physicians and hospitals to present these drugs to patients. This network and unique expertise in rare drugs comes from FIRDAPSE – a drug that they were able to identify, patent, and manufacture entirely in-house. Catalyst has shown both an intent and the capability to acquire and sell drugs to the market faster than their competitors, in spaces few firms can penetrate due to their niche nature.

Moreover, this network of physicians is likely to take on their novel drugs because Catalyst is diligent in its efforts to select only drugs with differentiating factors - drugs that likely would have been taken up by physicians irrelevant of marketing or loyalty to Catalyst. Therefore, they are able to substantially reduce their capital expenditures relative to other pharmaceutical firms in this space, thereby enabling them to increase not only their revenue but their profit margins as well.

Turning to one of their recent acquisitions, AGAMREE (Vamorolone). AGAMREE is a novel treatment for Duchenne Muscular Dystrophy (DMD), having only been approved by the FDA on October 26 2023. AGAMREE offers substantial



advantages over existing corticosteroids, which are the current standard of care but are often limited by long-term side effects. Given DMD's low average patient population age, with an average age of diagnosis from 2.5 - 5 years old. AGAMREE's unique dissociative steroid profile allows it to retain anti-inflammatory benefits while reducing adverse effects commonly associated with corticosteroids, such as weight gain, cataracts (46%), and height growth issues (85%). A key differentiator is in preserving the function of cardiac muscles, since long-term corticosteroid use can lead to cardiac muscle degeneration. These improvements are due to multiple novel biological mechanisms. Unlike traditional corticosteroids - the current treatment for DMD - it is more selective in which genes it transactivates, thereby preventing negative downstream effects from previously dormant genes being transcribed where they should remain dormant. Further, it is not broken down by enzymes in the body to form other compounds that can trigger harmful processes. Prednisone, a current competitor, in contrast, is metabolized into prednisolone, which can cause diabetes and osteoporosis. Moreover, it is a "heart-healthy" binding agent in the body. This improved safety and efficacy profile makes it a strong alternative to prednisone, especially in pediatric care, as is supported by numerous studies and an article published in JAMA, the American Medical Association's journal. Currently, 38.8% of DMD patients receive long-term corticosteroids, giving Catalyst space to capture market share for those who avoided medication due to adverse effects as well as a significant current and recurring market of patients on medication for life.

Moreover, AGAMREE is backed by strong market potential and exclusivity rights. Catalyst Pharmaceuticals has launched the drug in the U.S. and secured FDA approval, alongside orphan drug and new chemical entity exclusivity, granting the company seven years of market exclusivity for this indication. This minimizes competition and enhances profitability in a market where approximately 11,000 to 13,000 patients in the U.S. are affected by DMD. Given that DMD primarily affects children, often being diagnosed at the age of 2, patients are also likely to be dependent on this medication for longer than most medications - likely throughout their life. This is only heightened by the severity of DMD, making it difficult for parents or patients to leave the condition untreated or opt out of medication, even if it is priced highly. With AGAMREE's unique minimization of common side effects, it is not only able to capture greater market share but expand the market to even the most newly diagnosed and medication-averse consumers.

## Risks

**Risk 1:** There is a chance that - due to management changes or otherwise - another drug similar to AGAMREE is not acquired.

**Risk Mitigation:** This is unlikely, however, because the current and longstanding Management appears to be confident in directing the company towards further acquisitions. Rather than being an implicit mindset, this is an explicit strategy they have laid out in their most recent corporate presentation: the "[s]trategic pursuit of ... new portfolio opportunities" in industries similar to those they are familiar with and already have a stronghold in.

**Risk 2:** In their pursuit of expansion and acquisition, management may fail to acknowledge and accept the sunk costs of FYCOMPA, leading them to renew the license instead of acquiring another license for a different drug. Moreover, the legal process to not renew the license might be trickier than expected because the current structure of the contract is complex and may not allow Catalyst to simply not renew the license. They currently have an agreement to continue sales of FYCOMPA after 2026 and pay Eisai Co royalty payments based on sale amounts (since Catalyst won't own the license anymore).

**Risk Mitigation:** As discussed previously, management seems to have accepted the underperformance of FYCOMPA as showcased by the lack of justification for its poor performance on the earnings call. Moreover, the contract is

renegotiable and Catalyst’s legal team has ensured they can get out of the deal if needed. It is true that it will require more spending on legal counsel, however, if the company truly does understand the problems associated with FYCOMPA (and we believe the earnings call and 10-Q clearly showcase that they do), we would presume that marginal frictional costs in depositing of the drug license would not deter them.

## Valuation

### Revenue Build Key Assumptions

**FIRDAPSE:** We look at worldwide population when generating FIRDAPSE’s revenue build, in particular considering expansion to Japanese markets following the Japanese Ministry of Health approving DyDo Pharma’s request to sell and market the drug in Oct. 2024 (Catalyst is to receive upfront and milestone payments from Dydo, its sub-licensee). We assume a fixed worldwide prevalence (2.8 per million people), as well as an increase in the percentage of diagnoses worldwide, which is in line with our assumptions about the increased awareness and diagnostic efforts toward the disease (see Thesis 1). We split penetration rate into two groups: those affected by SCLC, and those unaffected by it. In either case, we predict penetration rate to increase across the world due to improving diagnostic efforts and consistent R&D efforts only tailored toward FIRDAPSE (the other drugs in Catalyst’s portfolio are not produced or manufactured in-house). Lastly, the price of FIRDAPSE is projected to grow with inflation but not any more than that, due to punishment received in previous years by the FDA for non-competitive price-raising practices.

#s in millions, apart from price	2023	2024P	2025P	2026P	2027P	2028P	2029P	2030P	2031P	2032P	2033P	2034P	2035P	2036P	2037P	2038P	2039P	2040P
<b>FIRDAPSE</b>																		
World Population	8,091.00	8,161.39	8,230.76	8,300.73	8,371.28	8,442.44	8,514.20	8,582.31	8,650.97	8,720.18	8,785.58	8,851.47	8,917.86	8,984.74	9,052.13	9,120.02	9,188.42	9,257.33
% change	0.88%	0.87%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.80%	0.80%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.75%
Estimated LEMS Prevalence (worldwide, per million)	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%	0.00028%
Total population affected by LEMS	0.023	0.023	0.023	0.023	0.023	0.024	0.024	0.024	0.024	0.024	0.025	0.025	0.025	0.025	0.025	0.026	0.026	0.026
Percent of total cases that get diagnosed	55%	55%	57%	59%	59%	60%	64%	66%	69%	71%	71%	73%	73%	75%	75%	76%	76%	77%
Total potential treatment cohort	0.012	0.013	0.013	0.014	0.014	0.014	0.015	0.016	0.017	0.017	0.017	0.018	0.018	0.019	0.019	0.019	0.020	0.020
Treatment cohort associated with SCLC	0.0075	0.0075	0.0079	0.0082	0.0083	0.0085	0.0092	0.0095	0.0100	0.0104	0.0105	0.0109	0.0109	0.0113	0.0114	0.0116	0.0117	0.0120
Penetration Rate (% receiving FIRDAPSE treatment)	40.00%	42.00%	49.00%	50.00%	52.00%	52.00%	53.00%	53.00%	55.00%	57.00%	58.00%	58.00%	60.00%	60.00%	61.00%	63.00%	63.00%	63.00%
SCLC cohort receiving treatment	0.0030	0.0032	0.0039	0.0041	0.0043	0.0044	0.0049	0.0050	0.0055	0.0059	0.0061	0.0063	0.0066	0.0068	0.0068	0.0071	0.0074	0.0075
Treatment cohort not associated with SCLC	0.0050	0.0050	0.0053	0.0055	0.0055	0.0057	0.0061	0.0063	0.0067	0.0069	0.0070	0.0072	0.0073	0.0075	0.0076	0.0078	0.0078	0.0080
Penetration Rate (% receiving FIRDAPSE treatment)	70.00%	70.00%	75.00%	77.00%	77.00%	78.00%	79.00%	80.00%	80.00%	81.00%	81.00%	82.00%	82.00%	82.00%	83.00%	83.00%	84.00%	85.00%
Non-SCLC cohort receiving treatment	0.0035	0.0035	0.0039	0.0042	0.0043	0.0044	0.0048	0.0051	0.0053	0.0056	0.0057	0.0059	0.0060	0.0062	0.0063	0.0064	0.0066	0.0068
Total Population Receiving FIRDAPSE treatment	0.0065	0.0067	0.0078	0.0083	0.0086	0.0089	0.0097	0.0101	0.0109	0.0115	0.0117	0.0122	0.0125	0.0130	0.0132	0.0135	0.0140	0.0143
% of total potential treatment cohort	52.00%	53.20%	59.40%	60.80%	62.00%	62.40%	63.40%	63.80%	65.00%	66.60%	67.20%	67.60%	68.80%	68.80%	69.20%	69.80%	71.40%	71.80%
% of total LEMS population	28.60%	29.26%	33.86%	35.87%	36.58%	37.44%	40.58%	42.11%	44.85%	47.29%	47.71%	49.33%	50.22%	51.60%	51.90%	53.05%	54.26%	55.29%
FIRDAPSE annual price per patient (USD)	40040.60	40841.41	41658.24	42491.41	43341.23	44208.06	45092.22	45994.06	46913.94	47852.22	48809.27	49785.45	50781.16	51796.79	52832.72	53889.38	54967.16	56066.51
% growth	-	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Revenue associated with FIRDAPSE	259.43	273.08	325.06	354.27	371.62	391.26	436.19	465.40	509.67	552.48	572.87	608.90	636.84	672.38	694.99	730.01	767.39	803.46
% growth	-	5.26%	19.03%	8.99%	4.90%	5.29%	11.48%	6.70%	8.51%	8.40%	3.89%	6.29%	4.59%	5.58%	3.36%	5.04%	5.12%	4.70%

**FYCOMPA:** For FYCOMPA, only the US market is considered, the only location where Catalyst holds commercialization rights to the drug. We predict a constant growth rate for the US population, as well as a constant prevalence of epilepsy. In line with Thesis 3, however, we predict FYCOMPA sales to stop halfway through FY 2026, when its patent expires. Our projected revenues for 2024, 2025, and 2026 thus reflect this assumption.

#s in millions, apart from price	2023	2024	2025	2026	2027
<b>FYCOMPA</b>					
Population of the USA	334.91	336.92	338.94	340.97	343.02
% change	0.60%	0.60%	0.60%	0.60%	0.60%
% population affected by seizures	1.20%	1.20%	1.20%	1.20%	1.20%
Seizures patients in the USA	4.02	4.04	4.07	4.09	4.12
FYCOMPA Revenue/Patient (USD \$)	34.36	35.04	35.74	36.46	0.00
% change (to take into account inflation, and potential price hikes)	-	2.00%	2.00%	2.00%	-
FYCOMPA Revenue (USD \$)	138.08	141.68	145.38	74.59	0
% change	-	2.61%	2.61%	-48.69%	-

**AGAMREE:** AGAMREE’s novel biological mechanisms and strong exclusivity protection gives us a bullish outlook on its future revenues. We assume a growing prevalence of DMD across the US, as well as an increase in the number of patients treated over the next 10-15 years. AGAMREE’s status as an orphan drug, backed by its strong patent and exclusivity protections, also gives it significant pricing power and is reflected in its growing price per patient.

#s in millions, apart from price	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
<b>AGAMREE</b>																		
US Population	334.91	336.92	338.94	340.97	343.02	345.07	347.14	349.23	351.32	353.43	355.55	357.68	359.83	361.99	364.16	366.35	368.55	370.76
% change	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
DMD Prevalence (US)	0.0060%	0.0061%	0.0062%	0.0064%	0.0065%	0.0066%	0.0068%	0.0069%	0.0070%	0.0072%	0.0073%	0.0075%	0.0076%	0.0078%	0.0079%	0.0081%	0.0082%	0.0084%
% change	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Possible DMD Patients (US)	0.020	0.021	0.021	0.022	0.022	0.023	0.023	0.024	0.025	0.025	0.026	0.027	0.027	0.028	0.029	0.030	0.030	0.031
DMD Patients Treated (US)	0.017	0.018	0.019	0.020	0.021	0.021	0.022	0.023	0.023	0.024	0.025	0.026	0.027	0.028	0.029	0.030	0.030	0.031
% of DMD patients	84.60%	86.60%	88.60%	90.60%	92.60%	93.60%	94.60%	94.60%	94.60%	94.60%	94.60%	95.60%	95.60%	95.60%	96.60%	96.60%	96.60%	96.60%
AGAMREE price per patient per year (\$ USD)	5,832.42	6,415.66	6,928.91	7,344.65	7,711.88	8,097.48	8,502.35	8,927.47	9,373.84	9,842.53	10,334.66	10,851.39	11,393.96	11,963.66	12,561.84	13,189.94	13,849.43	14,541.90
% change	-	10.00%	8.00%	6.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
<b>AGAMREE Revenue (US)</b>	<b>99.15</b>	<b>114.56</b>	<b>129.89</b>	<b>144.47</b>	<b>159.09</b>	<b>173.26</b>	<b>188.67</b>	<b>203.28</b>	<b>219.01</b>	<b>235.97</b>	<b>254.24</b>	<b>276.82</b>	<b>298.26</b>	<b>321.35</b>	<b>349.85</b>	<b>376.94</b>	<b>406.12</b>	<b>437.57</b>
% change	-	15.54%	13.38%	11.22%	10.12%	8.91%	8.89%	7.74%	7.74%	7.74%	7.74%	8.88%	7.74%	7.74%	8.87%	7.74%	7.74%	7.74%

**Acquisition:** Our newly-acquired drug, beginning FY 2027, will be largely based off AGAMREE. We assume AGAMREE's financial success thus far, as well as its exclusivity and status protection as an orphan drug over the next 7 years, will be the motivation behind Catalyst's acquisition of the new drug. It will be projected to have a fixed prevalence, assuming another niche disease targeted, as well as an increasing penetration rate over time due to a novel biological mechanism that makes this drug more appealing than its other (few) competitors. Revenues (beginning 2027) are projected to increase year-over-year, albeit on average less than AGAMREE’s so as to keep a slightly more conservative outlook.

#s in millions, apart from price	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
US Population	343.02	345.07	347.14	349.23	351.32	353.43	355.55	357.68	359.83	361.99	364.16	366.35	368.54	370.76
% change	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
Disease Prevalence (US)	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Potential Patients (US)	0.034	0.035	0.035	0.035	0.035	0.035	0.036	0.036	0.036	0.036	0.036	0.037	0.037	0.037
Penetration Rate	40%	45%	50%	55%	55%	60%	60%	65%	70%	70%	75%	75%	75%	75%
Total Patients Treated	0.014	0.016	0.017	0.019	0.019	0.019	0.021	0.021	0.023	0.025	0.025	0.027	0.028	0.028
Price per patient per year (\$ USD)	7000	7140	7283	7428	7577	7729	7883	8041	8202	8366	8533	8704	8878	9055
% change	-	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
<b>Revenue (US, millions)</b>	<b>96.04</b>	<b>110.87</b>	<b>126.41</b>	<b>142.68</b>	<b>146.41</b>	<b>150.23</b>	<b>168.17</b>	<b>172.56</b>	<b>191.83</b>	<b>211.98</b>	<b>217.52</b>	<b>239.14</b>	<b>245.39</b>	<b>251.80</b>
% change	-	15.44%	14.01%	12.87%	2.61%	2.61%	11.94%	2.61%	11.16%	10.51%	2.61%	9.94%	2.61%	2.61%

### Three-Statement Model Key Assumptions

#### Income Statement:

- **Revenue:** taken from our four revenue models.
- **Cost of Sales:** taken as historical average of previous percentages of revenue. We assume that when revenues increase, the cost of sales will scale, as the third-party manufacturing costs and royalties paid (items captured within this item) will increase along with the volume of products that Catalyst sells.
- **Operating expenses:** SG&A and D&A expenses will increase in terms of their absolute amount, but decrease as a percentage of revenue. We believe that operating efficiency will increase over time, as Catalyst shifts growth focus toward an acquisition-based approach while improving efficiency of their in-house manufacturing of FIRDAPSE. One-time expenses (i.e. the huge spike in both SG&A and D&A in 2023) are not included in our overall model, as we believe that is not representative of the company’s core operations that account for these margins. R&D expenses follow a similar pattern, as the company still incurs them due to their aim of improving FIRDAPSE’s efficiency and penetration rate to capture growth in the global LEMS market.



## Cash Flow Statement:

- **Operating Cash Flow:** The majority of Catalyst's operating cash flow can be derived from the Balance Sheet and Income Statement. Stock-based compensation is derived as a fixed percentage of SG&A, which it has historically been.
- **Investing Cash Flow:** Payment in connection with asset acquisition is directly related to other other intangible assets; we assume a \$190.32 million payment in 2027 associated with the acquisition of our new drug's licenses and patents, as well as consistent \$50 million payments from 2030-2040 in anticipation of FIRDAPSE's renewals as well as other licensing costs associated with the other two drugs in the portfolio, as well as giving allowance for any new acquisitions that may not be as great in magnitude as the one we anticipate in 2027. Investment in securities has been done historically and sporadically, so we continue this pattern by anticipating Catalyst to make a relatively small strategic investment (\$15-20 million) every 2-3 years in the projected period, following their \$13.5 million investment in Santhera following AGAMREE's acquisition in 2023.
- **Financing Cash Flow:** Catalyst has historically financed its operations using its cash from operations as well as by issuing common stock. As we foresee a strong cash flow already, we only foresee two rounds of common stock issuance, one in 2027 and one in 2030, in anticipation of the new drug acquisition and FIRDAPSE renewal efforts, respectively.

Fiscal Year	Cash Flow Statement Projection																					
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Net Income	31.88	74.98	39.48	83.08	71.41	124.32	147.05	148.56	160.01	197.62	219.16	241.14	277.19	302.68	328.51	365.50	398.00	424.74	453.85	483.74	520.50	547.34
Depreciation & Amortization	0.06	0.09	0.19	1.24	32.88	39.70	42.02	34.40	37.61	33.77	37.56	40.57	35.00	37.55	29.86	31.75	33.81	36.17	37.87	40.38	42.57	44.78
Asset Write-down & Restructuring Costs	-	-	-	-	81.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loss (Gain) From Sale of Investments	-	-	-	0.76	(3.02)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stock-Based Compensation	3.83	6.26	6.07	7.91	14.25	19.3	21.9	19.4	21.2	20.2	22.5	24.3	26.2	26.8	28.5	30.3	30.8	32.9	34.5	36.7	36.9	38.8
Other Operating Activities	(0.05)	(32.19)	9.60	9.33	(16.11)	(5.88)	(7.05)	(2.02)	(4.35)	(7.08)	(5.28)	(5.16)	(4.78)	(5.33)	(5.52)	(5.21)	(5.20)	(5.21)	(5.29)	(5.29)	(5.24)	(5.25)
Change in Accounts Receivable	(10.54)	4.55	(0.63)	(3.82)	(43.08)	(17.67)	(9.57)	3.64	(7.20)	(6.55)	(10.22)	(8.10)	(8.59)	(8.57)	(7.63)	(8.49)	(9.25)	(10.61)	(7.63)	(11.28)	(9.81)	(9.96)
Change in Inventory	(1.90)	(2.69)	(3.22)	1.07	(4.74)	3.56	2.58	1.09	4.75	2.15	3.34	0.70	3.60	3.26	2.31	2.53	2.71	3.64	2.50	3.53	3.08	3.17
Change in Accounts Payable	1.78	0.14	(1.49)	1.21	10.82	3.37	2.44	1.03	4.49	2.03	3.16	0.67	3.41	3.08	2.18	2.39	2.56	3.44	2.37	3.34	2.92	3.00
Change in Other Net Operating Assets	9.56	(6.11)	10.36	15.28	(0.33)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Cash Flow	34.61	45.03	60.37	116.05	143.60	166.66	199.33	206.07	216.49	242.12	270.19	294.08	332.00	399.52	378.17	418.74	453.40	485.08	518.12	551.18	590.90	621.89
Payment in Connection with Asset Acquisition	(0.02)	(0.01)	(1.02)	(10.03)	(198.52)	0	0	0	(190.32)	0.00	0.00	(50.00)	(50.00)	(50.00)	(50.00)	(50.00)	(50.00)	(50.00)	(50.00)	(50.00)	(50.00)	(50.00)
Sale (Purchase) of Intangibles	-	-	-	-	(81.51)	0	0	0	0.00	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment in Securities	37.24	(5.00)	(10.00)	19.24	(13.47)	0	0	(15.00)	0	0	(20)	0	(20)	0	(15)	0	(20)	0	(20)	0	0	(20)
Investing Cash Flow	37.23	(5.01)	(11.02)	9.21	(293.50)	0	0	(15.00)	(190.32)	0.00	0.00	(70.00)	(50.00)	(65.00)	(50.00)	(70.00)	(50.00)	(70.00)	(50.00)	(70.00)	(50.00)	(70.00)
Issuance of Common Stock	1.12	0.76	4.10	9.57	2.79	50	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
Repurchase of Common Stock	-	(0.06)	(12.24)	(7.14)	(0.98)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Financing Activities	-	-	-	(0.74)	(12.67)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financing Cash Flow	1.12	0.70	(8.14)	1.69	(10.86)	50.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0	0	0	0	0	0	0	0	0
Beginning Cash Balance	16.56	89.52	130.24	171.45	298.40	137.64	354.30	553.63	744.69	770.86	1,012.99	1,283.18	1,607.26	1,889.26	2,183.78	2,511.95	2,860.69	3,264.10	3,699.18	4,147.30	4,648.48	5,189.38
Net Cash Flow	72.96	40.72	41.21	126.95	(160.76)	216.66	199.33	191.07	26.17	242.12	270.19	324.08	282.00	294.52	328.17	348.74	403.40	435.08	448.12	501.18	540.90	551.89
End Cash Balance	89.52	130.24	171.45	298.40	137.64	354.30	553.63	744.69	770.86	1,012.99	1,283.18	1,607.26	1,889.26	2,183.78	2,511.95	2,860.69	3,264.10	3,699.18	4,147.30	4,648.48	5,189.38	5,741.28

## DCF and Comparable Companies

#s in millions	Historical			Projected							
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Revenue	140.833	214.203	398.204	529.33	600.33	573.33	626.75	675.39	751.26	811.36	
% growth	-	52.10%	85.90%	32.93%	13.41%	-4.50%	9.32%	7.76%	11.23%	8.00%	
EBIT	52.385	101.838	86.812	155.88	185.79	187.77	202.84	252.33	280.67	309.59	
% rev	37.20%	47.54%	21.80%	29.45%	30.95%	32.75%	32.36%	37.36%	37.36%	38.16%	
(+) D&A	0.19	1.24	32.88	39.70	42.02	34.40	37.61	33.77	37.56	40.57	
% rev	0.14%	0.58%	8.26%	7.50%	7.00%	6.00%	6.00%	5.00%	5.00%	5.00%	
(-) CapEx	1.02	10.03	198.52	0.00	0.00	0.00	190.32	0.00	0.00	50.00	
% rev	0.72%	4.68%	49.85%	0.00%	0.00%	0.00%	30.37%	0.00%	0.00%	6.16%	
NWC	11.91	(34.84)	6.00	11.22	13.58	1.91	0.47	-12.44	-25.52	-45.57	
% rev	8.45%	-16.26%	1.51%	2.12%	2.26%	0.33%	0.07%	-1.84%	-3.40%	-5.62%	
Change in NWC		(46.75)	40.84	5.23	2.35	(11.67)	(1.44)	(12.90)	(13.08)	(20.05)	
FCF		116.17	(139.81)	154.19	182.36	190.27	4.50	240.46	266.20	248.38	
Discounted FCF				139.50	149.26	140.90	3.02	145.74	145.97	123.22	



Projected									
2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
875.09	938.69	995.29	1,058.29	1,126.93	1,205.71	1,262.36	1,346.08	1,418.90	1,492.82
7.85%	7.27%	6.03%	6.33%	6.49%	6.99%	4.70%	6.63%	5.41%	5.21%
357.02	390.56	424.55	473.22	515.98	551.17	589.47	628.80	677.17	712.48
40.80%	41.61%	42.66%	44.72%	45.79%	45.71%	46.70%	46.71%	47.72%	47.73%
35.00	37.55	29.86	31.75	33.81	36.17	37.87	40.38	42.57	44.78
4.00%	4.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
5.71%	5.33%	5.02%	4.72%	4.44%	4.15%	3.96%	3.71%	3.52%	3.35%
-70.61	-102.45	-143.41	-193.22	-236.43	-265.94	-280.36	-292.17	-306.65	-347.87
-8.07%	-10.91%	-14.41%	-18.26%	-20.98%	-22.06%	-22.21%	-21.71%	-21.61%	-23.30%
(25.04)	(31.84)	(40.95)	(49.82)	(43.20)	(29.51)	(14.41)	(11.82)	(14.48)	(41.22)
284.24	319.34	346.87	395.00	423.29	438.98	455.00	485.12	527.11	583.19
127.57	129.66	127.42	131.27	127.27	119.41	111.97	108.01	106.17	106.27

WACC Calculation	
Risk Free	4.43%
Levered Beta	1.12
Market Risk Premium	5.50%
Effective Tax Rate	23.20%
Cost of Equity	10.59%
Cost of Debt	0.00%
Current Stock Price (\$)	22.34
Shares Outstanding	119.27
Market Cap	2664.40
Cash Balance	442.331
Total Debt	3.56
Net Debt	(438.77)
Percent Equity	99.46%
Percent Debt	0.54%
WACC	10.53%

Terminal Value: Gordon Growth Method	
Terminal Growth Rate	2%
Terminal Value	6970.91
Present Value of TV	2316.67
Sum of Near Term Cash Flows	2042.63
Implied Enterprise Value	4359.30
Implied Equity Value	4359.74
Implied Share Price	36.55
Upside	63.61%

Peers	P/E Ratio
Keros Therapeutics	4.7
Agios	4.73
Galapagos	8.1
Alkermes	14.38
Amphastar Pharmaceuticals	14.84
Harmony Biosciences	15.72
United Therapeutics Corporation	15.97
Jazz Pharmaceuticals	17.13
Jazz Pharmaceuticals	17.13
ACADIA	21.63
Exelixis	21.95
Median	15.72
Catalyst Pharmaceuticals	17.58

Link to Full Model: [📄 NASDAQ: CPRX Valuation Models](#)

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# How useful is sell-side equity research?

While sell-side equity research (SSER) plays a vital role in financial markets as an information intermediary and signaling mechanism, its effectiveness in generating alpha remains a contentious topic among researchers and industry professionals. To explore this, we construct a mock portfolio weighted according to sell-side analysts' buy recommendations and benchmark its performance against Invesco's S&P Equal Weight ETF (RSP) from 2009 to 2024. Despite its design, the SSER portfolio underperforms the RSP across key metrics, including cumulative return and annualized return. Additionally, SSER exhibits comparable or higher volatility, implying limited capacity to mitigate idiosyncratic risk. Our research challenges current perspectives in the literature that SSER may be able to predict superior investment outcomes. We conclude with implications for the investing industry and commentary on applicability to the research of student investors.<sup>1</sup>

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## Introduction

The role and value of sell-side equity research (SSER) has been a topic of interest to both financial economists and industry professionals. On one hand, SSER serves a critical role in the efficiency of financial markets through information sharing and signaling. Indeed, economists' findings on the reliability and validity of SSER tend to be somewhat positive. On the other hand, SSER tends to have a multidimensional stigma among investors. Some fear the relationship between sell-side institutions and their clients may taint the rigor and unbiasedness of valuation and analysis. Others view SSER as a superficial supplement to the revenue-generating activities for investment banks. This industry stereotype is further reinforced by the perceived external differences between buy- and sell-side investing. While buy- and sell-side investing philosophies differ significantly, there are considerable parallels in their research methodologies. Acknowledging these mixed opinions on SSER, we aim to evaluate the usefulness of SSER in investing and the role it plays in the larger finance industry.

We segment our investigation into four parts. We begin with an overview of the literature on the role of SSER in financial markets and its perception among industry professionals and investors in Section 1. Section 2 details our research methodology and the construction of our model portfolio. In Section 3, we discuss the performance of our model portfolios and compare them to a variety of industry benchmarks. Finally, we conclude our analysis in Section 4, drawing larger implications for the role of SSER in academic finance and ending with a commentary on the application of our findings to our work at Promontory Investment Research.

## Literature Review

To narrow the focus of our research, we must first understand different measures of the "usefulness" of SSER. We find there are three measures of "usefulness" in the academic literature: accuracy, profitability, and information content. Accuracy refers to the accuracy of earnings forecasts, profitability refers to the return or performance of the stock, and information content refers to the information beyond target price and investment recommendations included in SSER.

### Accuracy

Accuracy of forecasts is a core value proposition of SSER and often plays a significant role in short-term stock performance. Analysts and investors pay considerable attention to sell-side analysts' earnings forecast—and the ability for firms to beat those forecasts—in the closest quarter as an indicator for the upcoming performance of the firm. The consensus on SSER with respect to accuracy is quite positive, with several studies finding SSER provides superior earnings forecasts, especially in the short term. Bradshaw et. al (2009) and Lacina et. al (2011) compared sell-side analysts' earnings forecasts to time-series forecasts made with random-walk models and found SSER outperformed the random-walk models on shorter time horizons. More specifically, they reported SSER had greater accuracy earnings prediction accuracy within one or two years, while random-walk models outperformed for periods greater than two years.

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<sup>1</sup> We would like to thank Jason Wang for his incredibly insightful questions and constructive feedback.

In addition to the time horizon, the accuracy of earnings forecasts is significantly influenced by investor sentiment. Building on the widely accepting belief in industry that sell-side institutions maintain a strong relationship with their clients and investors, Walter and Wills (2013) investigated the impact of investor sentiment on the accuracy of sell-side earnings forecasts. Their findings revealed higher levels of investor sentiment to be associated with a decline in the accuracy of the forecasts in SSER. In their analysis, they also decompose the Index for Consumer Expectation (ICE) into two distinct components: fundamental factors and investor sentiment. Their results indicated forecasting accuracy peaked when fundamental components played a dominant role in shaping investors' market expectations. Conversely, accuracy was lowest when investor sentiment emerged as the dominant influence on these expectations.

Prior research has also demonstrated a strong positive correlation between the accuracy of earnings forecasts and profitability. In a seminal study, Loh and Mian (2005) found SSER with greater forecasting accuracy were also associated with higher levels of profitability. By categorizing SSER into quintiles based on their forecasting accuracy and subsequently analyzing their profitability over the following 12 months, they established a clear relationship between these factors. Their findings highlight a significant parallel between the accuracy of earnings forecasts, the precision of valuation, and the profitability of returns, suggesting improvements in forecast accuracy could translate into tangible financial gains.

## Profitability

An intuitive measurement of SSER's usefulness is its profitability, or performance, especially relative to comparable research. Among industry professionals, particularly buy-side investors, SSER is insightful not for its valuation or investment recommendations but for its informational content, which we discuss below. This stereotype has led some to believe buy-side research outperforms sell-side research relative to both risk-return profile and quality of research (biasedness). While industry professionals are still skeptical of sell-side analysts' abilities to make profitable recommendations, the literature holds mixed attitudes on whether there is a material difference between the performance of buy-side equity research (BSER) and SSER.

In one of the earliest comprehensive studies comparing the performance and reliability between BSER and SSER, Cheng et al. (2004) analyzed data from over 1,200 U.S. equity funds from 2000 to 2001. Their findings suggested funds relying more heavily on internally generated research (BSER) tended to achieve superior profitability. However, more recent studies, particularly those conducted in the aftermath of the Great Financial Crisis in 2008, indicate the performance gap between BSER and SSER has narrowed or, in some cases, even reversed. For instance, Busse et al. (2011) examined abnormal returns following trades and recommendation changes over various time horizons (ranging from one day to three months) and discovered sell-side analysts demonstrated stronger stock selection abilities compared to their mutual fund peers. Similarly, Groysberg and Shanthikumar (2012) constructed a mock portfolio using sell-side investment recommendations and found "buy" and "strong-buy" recommendations to produce superior return profiles relative to those from buy-side analysts. They attributed this outperformance to the sell-side analysts' ability to adapt recommendations more rapidly and frequently in response to changing market conditions.

Evidence also suggests buy-side institutions often trade based on investment recommendations issued by sell-side analysts, though the direction of movement (buy-side trading off sell-side recommendations versus buy-side trades motivating sell-side recommendations) is difficult to discern. In one study, Busse et al. (2011) examined trading patterns surrounding recommendation changes and conducted a regression analysis to explore the lead-lag relationships between buy-side trades and SSER recommendations. Their findings indicate that buy-side institutions frequently act after sell-side recommendation revisions, with a lag of up to four weeks. This behavior underscores the possible influence of SSER recommendations on buy-side trading strategies. Further corroborating this trend, Xu et al. (2019) analyzed buy-side trading activity in the context of bankrupt firms. Over a five-year period leading up to bankruptcy, they observed that buy-side institutions consistently aligned their trades with SSER recommendations, which were typically optimistic. Their findings reinforce the results of Busse et al. that buy-side investors may rely on SSER to inform their investment research and even investment decisions.

## Information Content

In recent years, the focus of research on SSER has increasingly shifted toward its informational content. This shift is largely driven by the industry practice where buy-side investors often refer to sell-side analysts as key experts within their respective industries (**INTERVIEW**, 2024). The value of SSER extends beyond company-specific analyses, encompassing predictions not only for individual companies but also for broader industries and markets (Howe et al., 2009). As such, SSER has been characterized as a "market-knowledge-maker."

For instance, Crawford et al. (2012) used stock return synchronicity as a measure of the informational mix about firms and demonstrated that the first analysts to publish research on a firm effectively initiate the construction of knowledge in the firm's

specific market. This finding underscores the role of SSER in shaping market understanding. Furthermore, the dual role of SSER as an information intermediary was analyzed by Huang et al. (2017) through textual analysis. Their study highlighted two primary functions of SSER. First, sell-side analysts generate novel information beyond what is disclosed by company management. This advantage is attributed to their privileged access to management, allowing them to extract and interpret withheld insights. Second, SSER simplifies complex and often technical information, making it more accessible to investors and other stakeholders. Together, these roles solidify the position of SSER as both a creator and interpreter of market-critical information.

Different evaluation criteria impose varying expectations on SSER. When judged by accuracy, sell-side analysts are primarily valued for their forecasting abilities and their capacity to outperform statistical benchmarks, such as the random walk model. In the context of profitability, SSER is expected to function as an investment advisory tool, generating alpha and outperforming other market participants. Finally, when considering informational content, SSER is often regarded as a comprehensive knowledge repository, providing insights that extend beyond basic market analysis.

## Methodology

In determining the criteria for our research, several key factors were considered. First, SSER is most defined within the industry by their buy/sell/hold ratings prominently displayed on the front page of their research publications. This perspective is further supported by the empirically observed practice of buy-side firms frequently aligning their trading decisions with SSER recommendations. Additionally, in seeking to objectively evaluate the value of SSER, we hope to investigate the validity of existing industry stereotypes while maintaining analytical rigor.

We choose to evaluate the usefulness of sell-side equity research according to its profitability. Evidently, measuring information content depends too heavily on subjective evaluation across the investment industry. Conversely, focusing solely on accuracy would too tightly constrain the scope of our research as it overlooks how SSER influences investment decisions. Choosing profitability as the primary measure of SSER's useful provides us with a tangible and comprehensive metric of assessing its value in guiding investment decisions and performance.

To ensure the robustness of our methodology, we first reviewed the various approaches used in the literature to assess the profitability of sell-side equity research (SSER). Wnuczak (2021) evaluated the profitability of SSER recommendations by comparing expected returns, calculated using the CAPM model, with the actual returns of stock portfolios constructed according to SSER recommendations. This analysis was conducted using OLS regression and accounted for the well-documented tendency of analysts to issue disproportionately more buy recommendations than sell recommendations. Similarly, Groysberg and Shanthikumar (2012) explored the performance of stocks recommended by buy-side and sell-side analysts. Their study focused exclusively on Strong Buy and Buy recommendations, as these are considered the most influential for firms and analysts alike. Drawing from these studies, we developed a methodology designed to test the profitability of SSER while accounting for potential biases in SSER and ensuring the use of relevant and robust data.

To assess the profitability of sell-side equity research, we construct a mock portfolio and track its performance over the period beginning January 1, 2009, and ending November 30, 2023. The mock portfolio consists of S&P500 components which are weighted according to the proportion of sell-side analysts which have a relatively positive outlook for the company.<sup>2</sup> This weighting strategy offers two key advantages. First, it simplifies the portfolio construction process by focusing on buy ratings, which, as noted by Groysberg and Shanthikumar (2012), are arguably the most significant recommendations for firms and analysts. Second, it enables us to address bias by normalizing analyst ratings relative to the overall investment outlook for S&P 500 components, given the literature's acknowledgment of SSER's inherent bias toward buy recommendations (Wnuczak, 2021).

Recommendation data is queried from the Institutional Brokers' Estimate System (IBES) database hosted by the London Stock Exchange Group. Summary statistics including percent of brokers recommending buy, sell, and hold, as well as descriptive variables are updated at the monthly level. Price data is queried from the Center for Research in Security Prices (CRSP) at the University of Chicago's Daily Stock File database, which provides historical price data and Industry Classification Benchmark (ICB) markers. Data from CRSP provides a reliable source for data on both currently and previously listed securities, allowing us to minimize the survivorship bias in our analysis. We also supplement ICB industry classification with data from Yahoo Finance when industry data is unavailable from CRSP.

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<sup>2</sup> If  $p$  percent of sell-side analysts have a positive outlook (buy recommendation) on stock  $i$ , and sell-side analysts have an average outlook on all  $n$  stocks of  $\mu$  percent, then we define the weight on stock  $i$  to be  $w_i = \frac{\frac{1}{p}}{\sum_j \frac{1}{\mu}} \cdot \frac{p_i}{\mu} = \frac{np_i}{\sum_j p_j}$ .

To guarantee our methods are consistent with exchange traded fund (ETF) and index construction methodologies, we want to adjust the composition of the mock portfolio each time the S&P500 changes its composition (i.e., when new companies are added to or when existing companies is removed from the index). However, the composition of the S&P500 changed more than 1000 times since 2009, and adjustment of the mock portfolio at such a frequency is not feasible given data acquisition restraints. Under these restraints, we pick 10 equally spaced points in time at which the composition of our portfolio changes to reflect the changing composition of the S&P500.

We benchmark the performance of our portfolio against Invesco’s S&P 500 Equal Weight ETF (NYSEARCA: RSP) from the perspective of cumulative and 10-year annualized returns. We allocate a balance of \$1 at the start of our horizon so the value of our portfolio is analogous to the cumulative return of both our portfolio and RSP. For 10-year annualized returns, we compute returns for 6 different 10-year periods (2009-2019, 2010-2020, 2011-2021, 2012-2022, 2013-2023, and 2014-2024) and compare the performance of each period with the RSP’s for the corresponding period. As a standard metric for assessing portfolio performance, 10-year annualized returns provide a means to thoughtfully compare the longer-term return profile of our portfolio relative to a reliable benchmark.

## Results

Construction according to sell-side analyst recommendations yields a portfolio which does not differ significantly from that of RSP (Figure 1). Notably, relative to the 2024 weighting of RSP, the SSER portfolio is underweight stocks in the technology and financial services sectors by roughly 3.8% and 2.5%, respectively, and overweight stocks in the consumer cyclical (also known as consumer discretionary) and utilities by 5.0% and 3.2%, respectively.

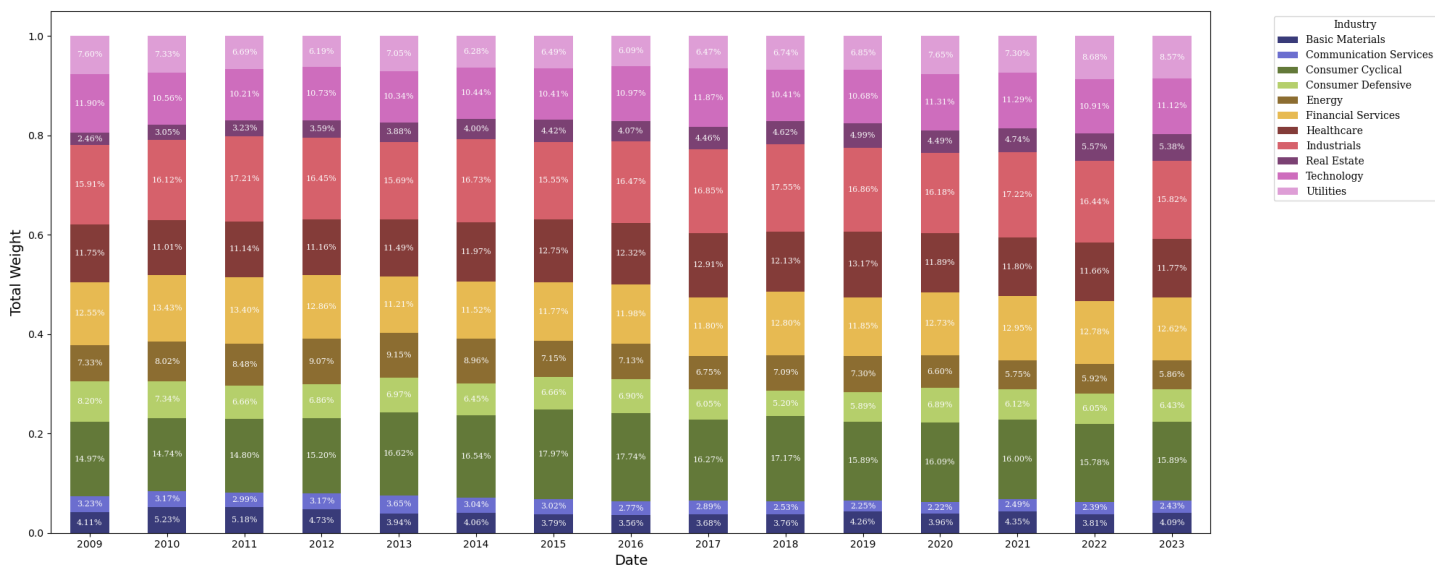


Figure 1: Industry composition of SSER weighted S&P 500, 2009-2023

An interesting trend arising across time is the reallocation of portfolio weight to different industries, which we hypothesize to be indicative of an increasingly positive investment outlook (or the converse) for a given sector. For instance, weighting toward industrials companies increased by nearly 2% from 2009 to 2023 while the number of S&P 500 components ICB classified industrials companies stayed roughly constant between periods, suggesting such a change in investor sentiment toward the industrials sector.

Figure 2 provides a comparative analysis of the cumulative returns for the SSER-weighted S&P 500 portfolio (SSER) and the S&P 500 equal weight benchmark (RSP) from 2009 to the end of 2023.<sup>3</sup> The SSER-weighted portfolio exhibits consistently lower cumulative returns relative to RSP, suggesting the portfolio’s construction delivers inferior returns in absolute terms (3.5x relative to 6x returns). This underperformance may reflect the inability of SSER ratings to capture market opportunities effectively. Additionally, we hypothesize slightly delayed reactions to market changes (i.e., a draw down in RSP is followed shortly after by a

<sup>3</sup> We interpolate missing portfolio values for three dates: 2015-05-12, 2015-06-09, and 2020-11-06 using nearest neighbor interpolation. These methods do not affect the overall findings of our research as nearest neighbors differ from one another by no more than 25 basis points.

draw down in SSER), contrary to the findings of Busse et al. (2011), to be attributable to a possible trend-following tendency in sell-side equity research.<sup>4</sup>

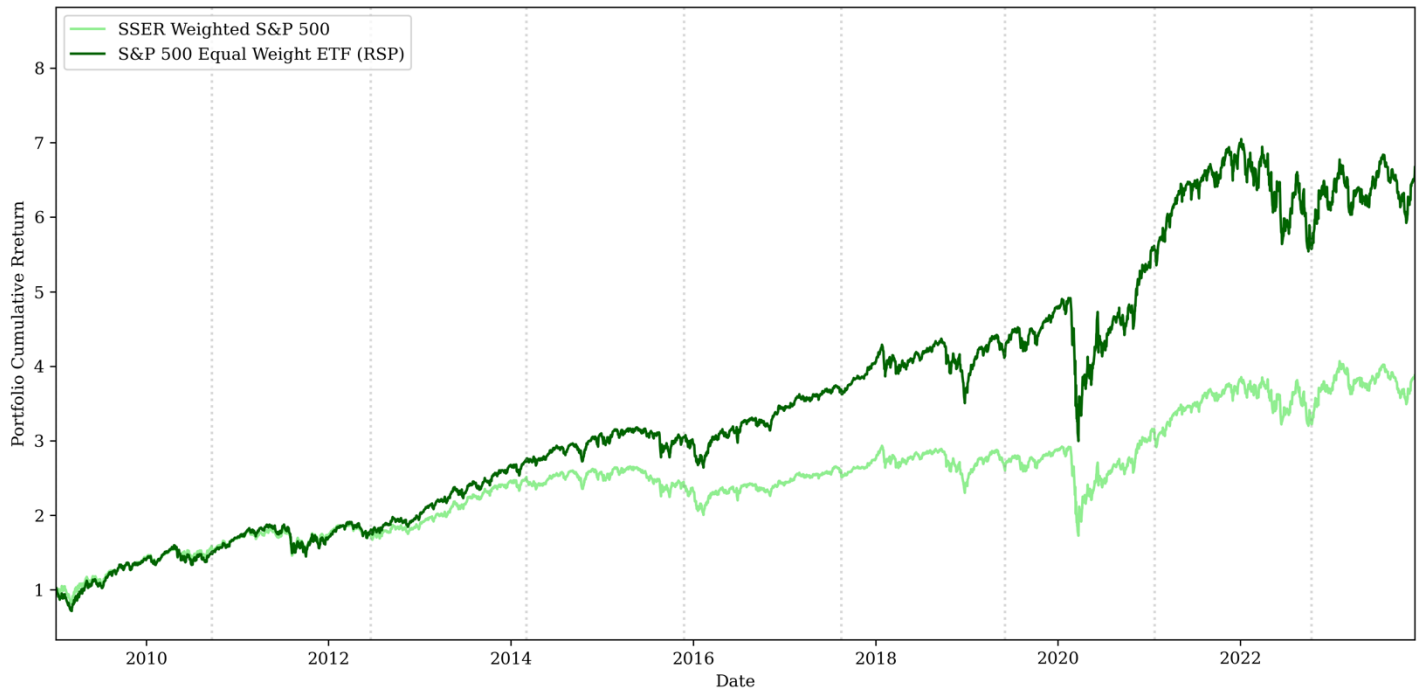
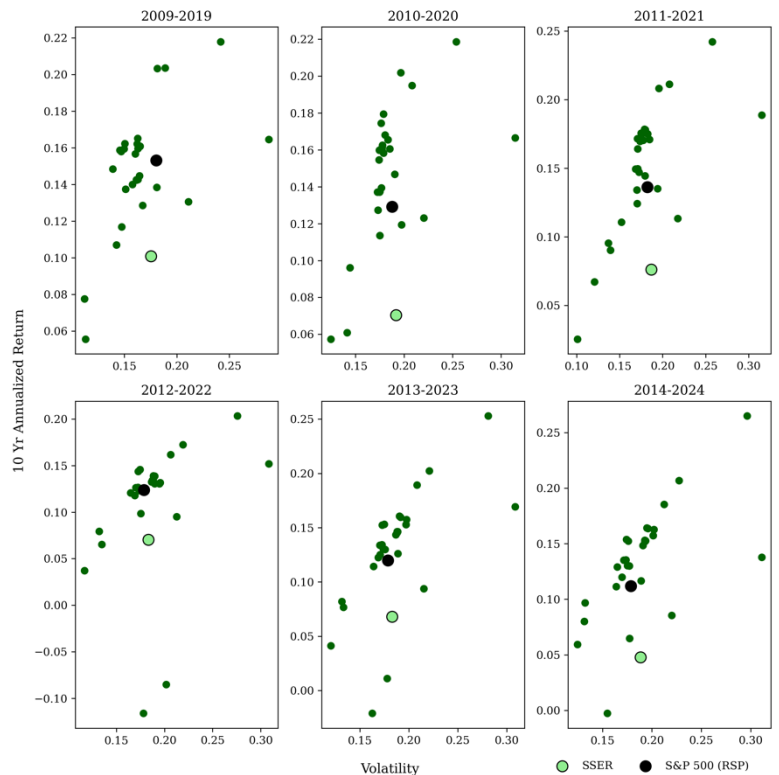


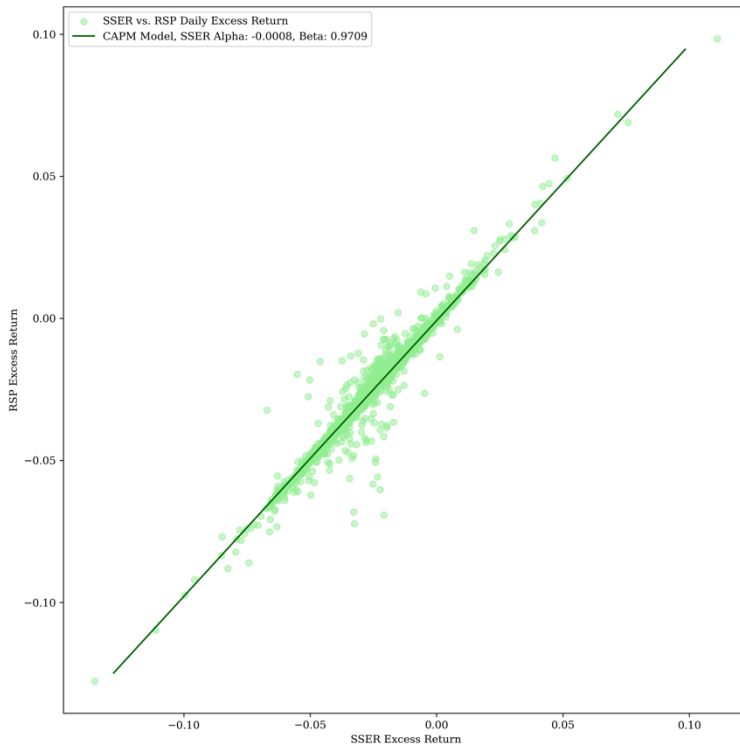
Figure 2: Cumulative returns of SSER weight and equal weight S&P 500

The divergence between the two portfolios becomes more pronounced over time, especially after 2013, with RSP pulling ahead significantly after 2016. This divergence suggests the active weighting scheme used for SSER does not compound an advantage over the equal weight methodology of RSP and that the incorporation of market information, such as analyst ratings, may not enhance portfolio performance. We believe these results are telling that the greater allocation of capital toward firms with stronger projected earnings or favorable fundamentals, as measured by higher average buy ratings among sell-side analysts, do not generate alpha. Equivalently, the lower cumulative return of the SSER portfolio implies SSER may not be able to reliably identify signals which are not yet fully priced into securities prices. However, Figure 2 also reveals potential risks. RSP appears to experience greater volatility than SSER during periods of market turbulence, such as the sharp downturn in 2020 coinciding with the COVID-19 pandemic. This heightened sensitivity may be indicative of greater exposure to systemic risk or a higher concentration in sectors which are disproportionately impacted by economic crises.



<sup>4</sup> For additional notes on trend-following, see Paleologo 2021 p. 60-66.





To verify this observation, we compare the SSER-weighted

*comparison of 10-year annualized returns and annualized volatility across different fund types*

portfolio to a variety of index, mutual, and exchange traded funds with a variety of focuses to determine if SSER has any peers—at least with respect to annualized returns and annualized daily volatility. In Figure 3, we plot the 10-year annualized returns of different funds against their annualized daily volatility and highlight RSP and SSER. The plot reveals an interesting and persistent relationship between annualized returns and annualized daily volatility between SSER and RSP. In each of the 6 periods, SSER consistently underperforms RSP’s annualized returns by 5% with comparable, and at times, slightly greater volatility. The SSER portfolio has a distinct risk-return profile, seldom clustering with other funds. From its unique and relatively weak profile, we believe sell-side equity research has little potential for long-term profitability and few alternative advantages.

Figure 4 supports our belief in the inability of the SSER-weighted portfolio to provide alternative investment benefit, namely to hedge idiosyncratic risk.<sup>5</sup>

An OLS regression of SSER-weighted portfolio excess return on RSP excess return yields a regression coefficient (market beta) of 0.9709 and intercept (Jensen’s alpha) of -0.008, suggesting a strong correlation to market returns and significant exposure to idiosyncratic risk and negligible, albeit negative, ability to generate excess returns. Granted, by subsetting our analysis of the profitability of SSER to S&P 500 components, we pre-select this exposure to market beta. However, we still believe the strong correlation between the SSER weighted and equal weighted S&P portfolios and the SSER weighted portfolio’s negative alpha allow us to draw robust conclusions on the underperformance of sell-side equity research with respect to profitability.

## Conclusion

We evaluate SSER’s usefulness regarding its performance over the past 15 years in comparison with the equal-weight S&P 500.

*Figure 4: Regression of SSER-weighted portfolio excess return on RSP excess return*

Contrary to prior findings in the literature reporting positively on sell-side equity research, we find a portfolio constructed based on SSER recommendations underperforms the market with respect to both annualized returns and annualized daily volatility. Although it returns positively, it has a high market beta (0.97) and is much more volatile, much less profitable, and has a negligible albeit negative alpha (-0.0008). One plausible explanation for the discrepancy between prior research and our findings is academia’s focus on comparing SSER with BSER, which is tailored specifically towards the industry stereotype of SSER as an inferior substitute and supplement to BSER. Acknowledging the failure of many buy-side investors to outperform the market, we believe there is a parallel between the struggle of investors and the result of our research.

Several implications can be drawn for our results. First, we see a shift in value proposition of SSER. In fact, this shift is already happening with regard to SSER’s role as an information intermediary. Rather than providing informed investment decisions, buy-side investors now perceive SSER to be the Google Scholar of the investing world. This brings new challenges to SSER as a paid service. If profitability does not contribute to SSER’s usefulness, sell-side needs to leverage its advantage in information content to generate revenue. Therefore, as more clients turn to the qualitative information rather than investment recommendation rating in SSER, the emphasis of SSER may also change.

<sup>5</sup> Portfolios with poor return profiles are useful in increasing the Sharpe Ratio of a portfolio—which we do not compute in this paper—by diversifying away the idiosyncratic risk (market beta) of the portfolio.

Conversely, our results reinforce the Efficient Market Hypothesis (EMH) with sell-side's limited ability to generate alpha. While there is material difference between the market and SSER, such as the weighting on different industries, SSER does not perform superior stock selection skills as reported by Busse et al. (2011) and Groysberg and Shanthikumar (2012).

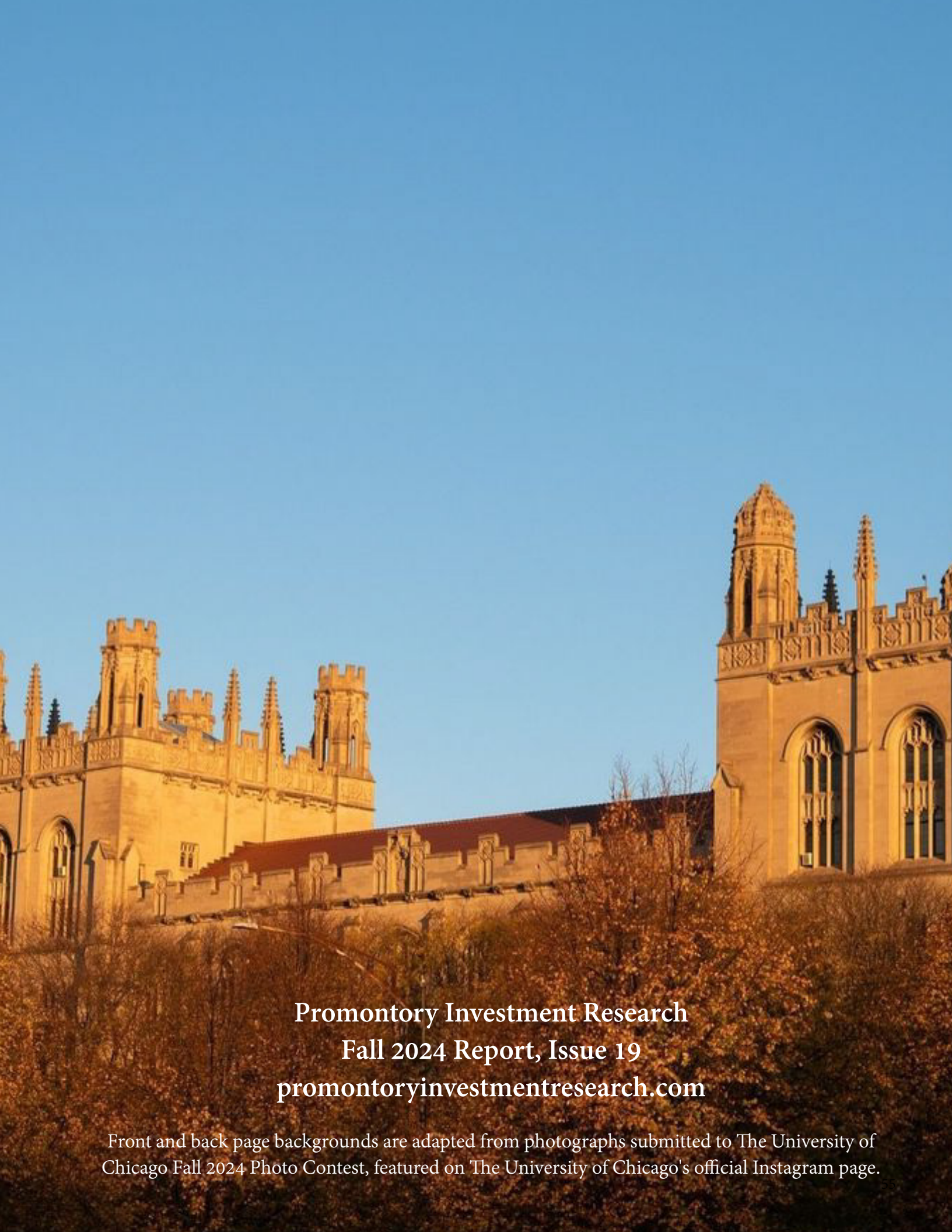
Aside from implications for the financial industry, our research provides insight to our work at Promontory Investment Research. Our findings highlight the importance of looking beyond SSER and emphasize the importance of generating differentiated investment theses and independence of ideation. While many student investors acknowledge the importance of differentiation, it is not uncommon—especially due to the informational value of SSER—for students to read SSER and subconsciously internalize those ideas, only to pass them off later as their own. Our findings that SSER does not outperform the market suggest student investors should not rely on SSER for ideation, and failure to differentiate research may lead to outcomes which are both highly correlated with and underperform market returns. However, we still advise student investors with a track record of independent research and a robust investment philosophy to visit SSER for diversity of thought.

Following our evaluation of the usefulness of SSER, we have identified several areas for additional research. A natural area for additional investigation would be to explore why SSER does not deliver strong profitability in the long run, and whether this truly is related to EMH. Perhaps weighting according to SSER is analogous to portfolio tilting toward certain investing factors (value, volatility, momentum, size, etc.). Alternatively, since the construction of our portfolio is limited to components of the S&P 500, alternative construction methodology of a portfolio derived from SSER recommendations may yield contradictory findings to our own. The ability to directly query CRSP, rather than manually, may be advantageous in this regard. Additionally, qualitative and textual analysis of SSER may be helpful in gauging the deciding factors of SSER's underperformance. We anticipate future research to provide additional insight on how investors can, if at all, generate alpha, by summarizing the pattern of underperformance described in our exploration of sell-side equity research.

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