

Pharma 101

How do pharma companies create value?

October, 2025

Courtney Breen – Senior Analyst, US Biopharmaceuticals
Woody Polglase – Senior Associate, US Biopharmaceuticals
Louisa Qiu – Associate, US Biopharmaceuticals

See Disclosure Appendix of this report for important Disclosures and Analyst Certifications

First Published: 14 Oct 2025 00:00 UTC Completion Date: 14 Oct 2025 00:00 UTC

Bernstein US Biopharma team



Courtney Breen

Senior Analyst

Courtney.breen@bernsteinsg.com

+1-917-344-8407

- 10 years of Biopharma & Consulting experience global & US
- While at Merck, worked across access and pricing, policy, business development and strategic functions; most recently leading strategy and operations for Merck's >\$20B Oncology business
- Previously consultant at Bain & Co covering pharmaceutical & retail clients
- BSc(hons) from Otago University (neuropharmacology)



Woody Polglase

Senior Research Associate

Woody.polglase@bernsteinsg.com

+44-207-676-6919

- Joined Bernstein in 2022, covering the EU Pharma and EU Consumer Goods sectors before joining the US Biopharma team.
- Prior to Bernstein, worked in academic (Imperial College/University of Cambridge) and industry labs (Vertex Pharmaceuticals), as well as biotech start-ups and funds.
- BSc in Biochemistry Imperial College London, MPhil in Therapeutics Sciences from the University of Cambridge, CFA Level 1 & Level 2



Louisa Qiu

Research Associate

Louisa.qiu@bernsteinsg.com

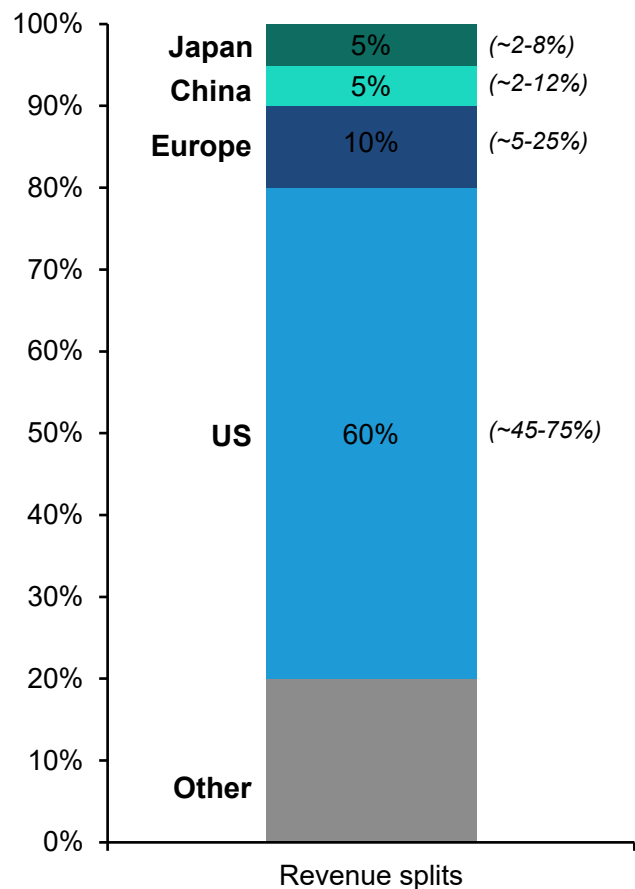
+1-917-344-8495

- Joined Bernstein in 2024, covering the US Biotechnology and US Life Science Tools & Diagnostics sectors before joining the US Biopharma team.
- Prior to Bernstein, worked in pharma (Novartis), healthcare consulting (Back Bay Life Science Advisors), as well as healthcare private equity (E Fund Management Co.).
- BS in Economics and BS in Nursing from the University of Pennsylvania, CFA Level 1

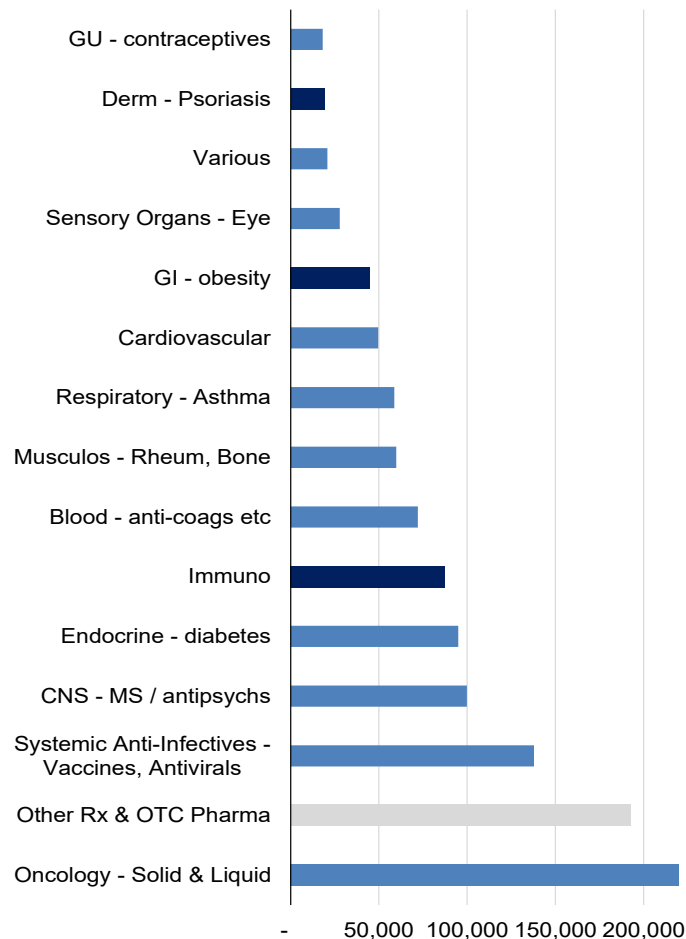
What are the key dimensions of the industry?

Where & how do these companies generate revenue?

Revenue proportion by region for patented medicines

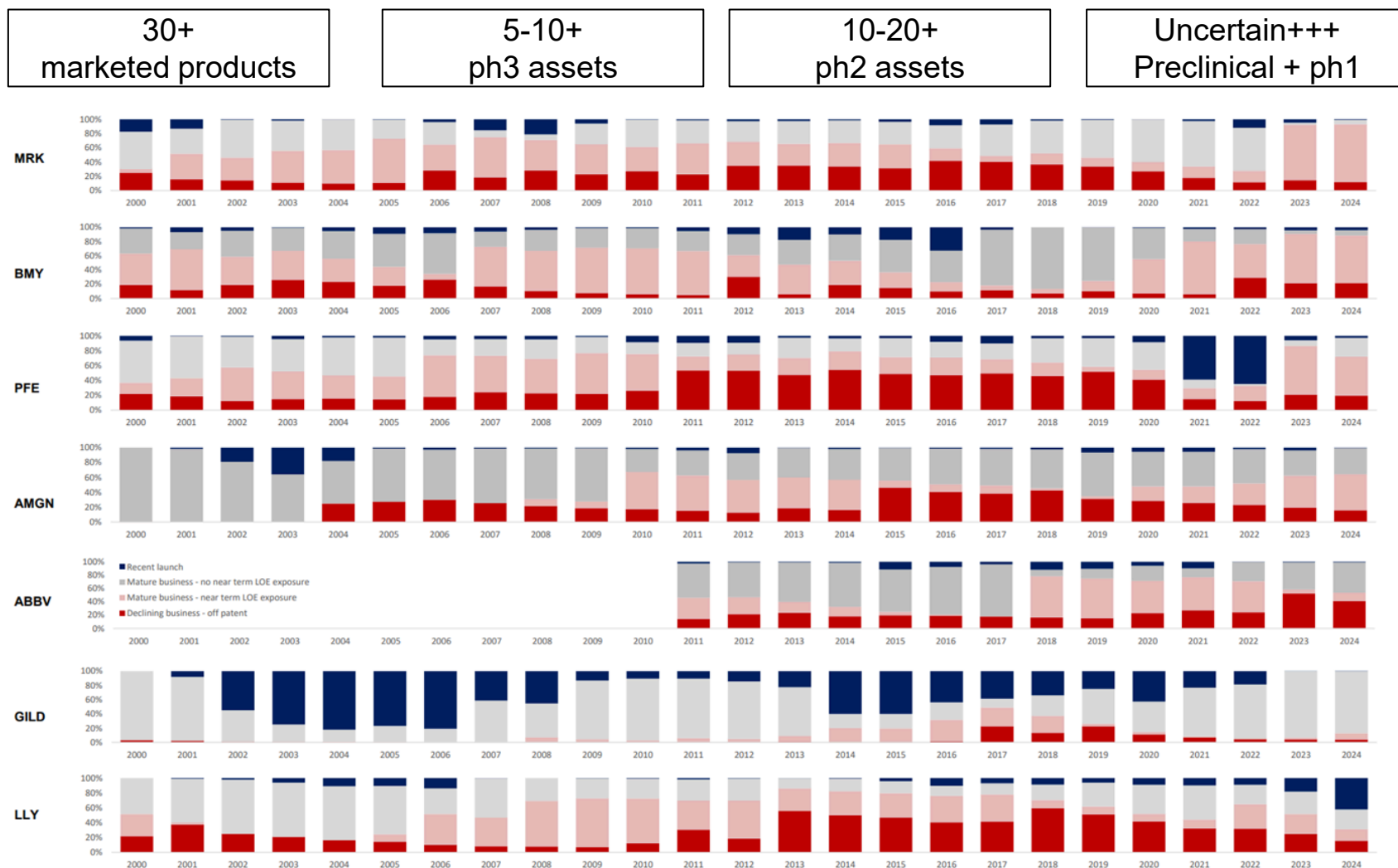


Revenue proportion by therapeutic area (incl. generics / OTC)



Source: Evaluate, Bernstein analysis

What do their portfolios look like? Forever reinventing...



Source: EvaluatePharma, Bernstein analysis

While patent expiries are company specific, the pressure has grown across the industry in total

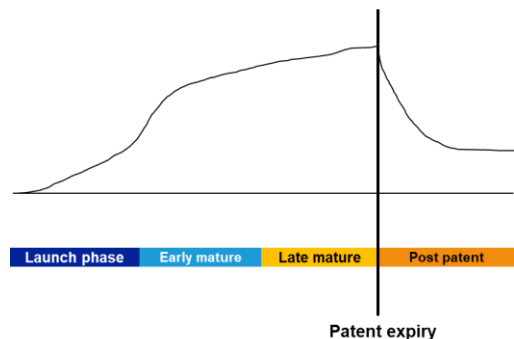
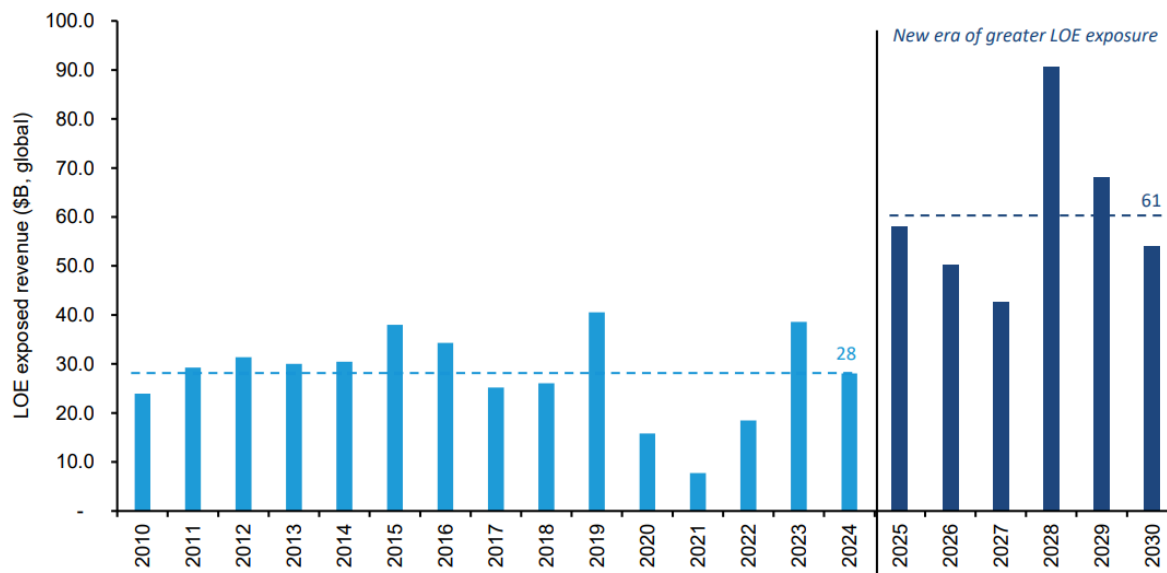


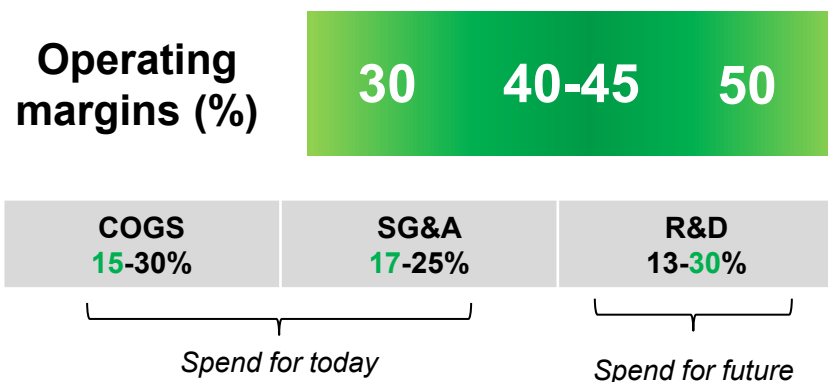
EXHIBIT 4: **LOE exposure in 2025 rises to more than double the prior decades**



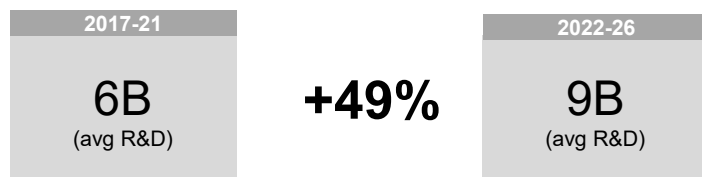
Source: Evaluate, Bernstein analysis

And top to bottom – how do they spend their \$\$?

Margins are healthy – with a sweet spot of 40-45%
balancing efficiency for today with future investment



R&D investment continues to trend-upwards (across the board)



And capital allocation...

Invest in the business

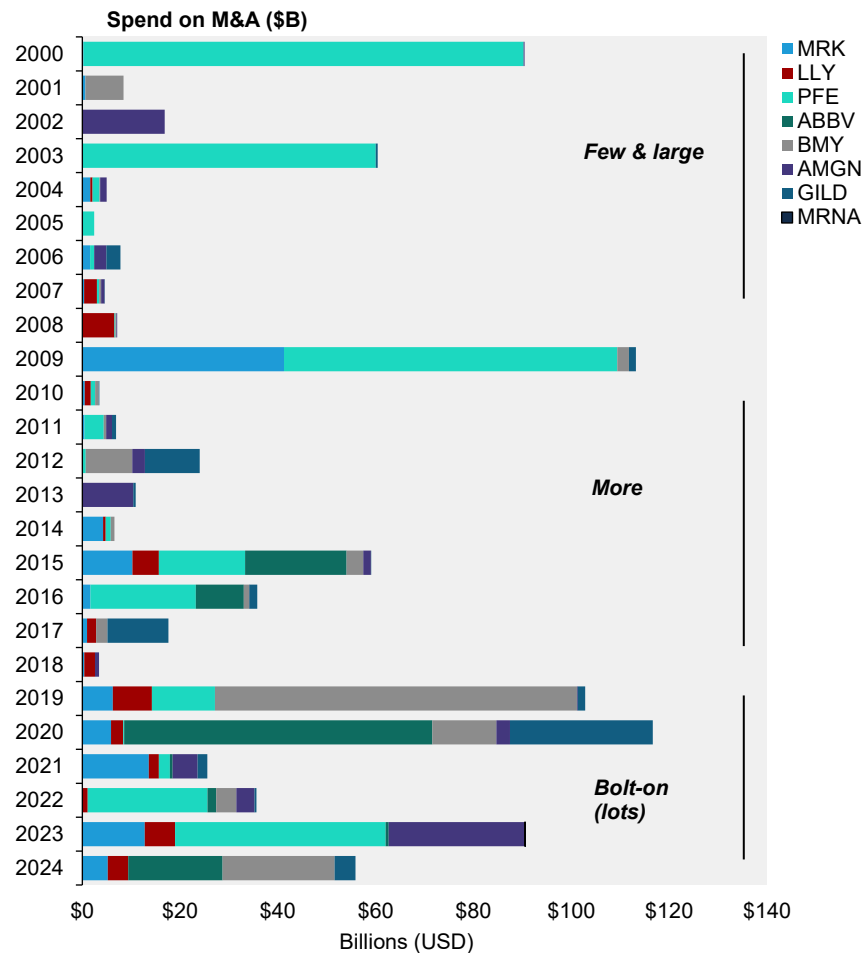
Bolster the pipeline (M&A)

Return dividends

Stock buybacks

Bolstering the pipeline comes in the form of both acquisitions & licensing – value creation from growth, not cost synergies

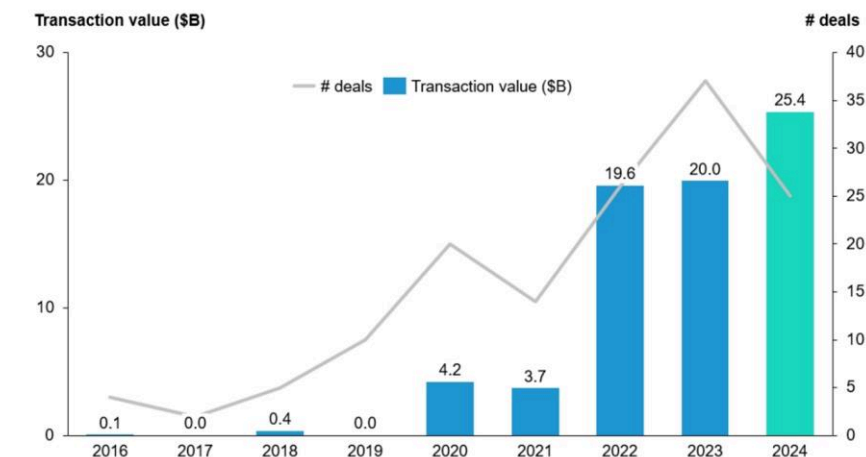
Pipelines are sourced internally & externally...



Source: Bloomberg, Evaluate, Bernstein analysis

And licensing (especially from China) is increasingly contributing to bolstering these pipelines

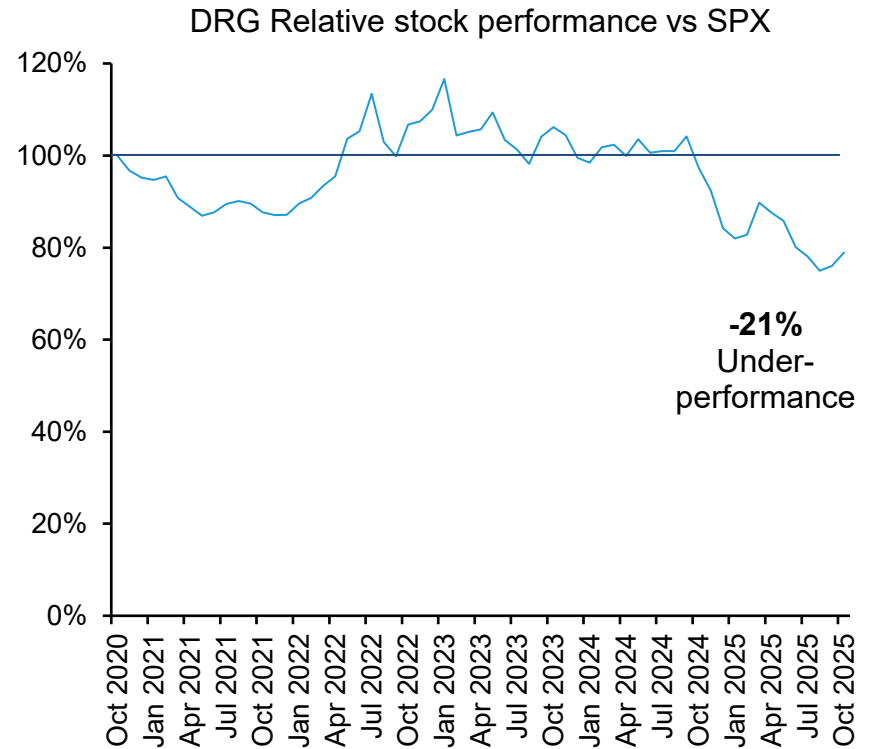
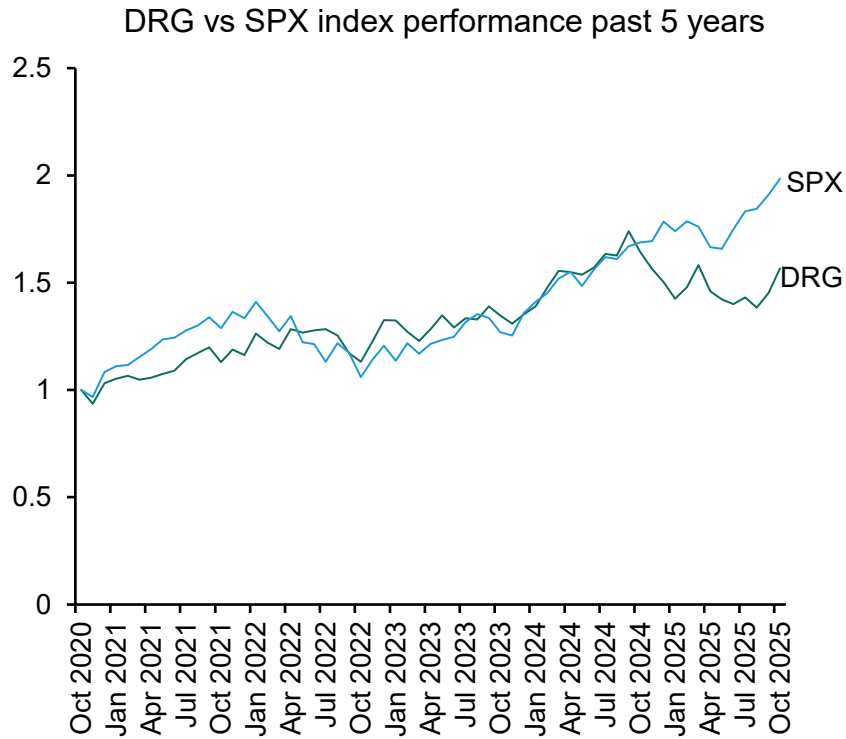
Number & value of licensing deals sourced from China



Source: Bloomberg, Bernstein analysis

How do the stocks perform?

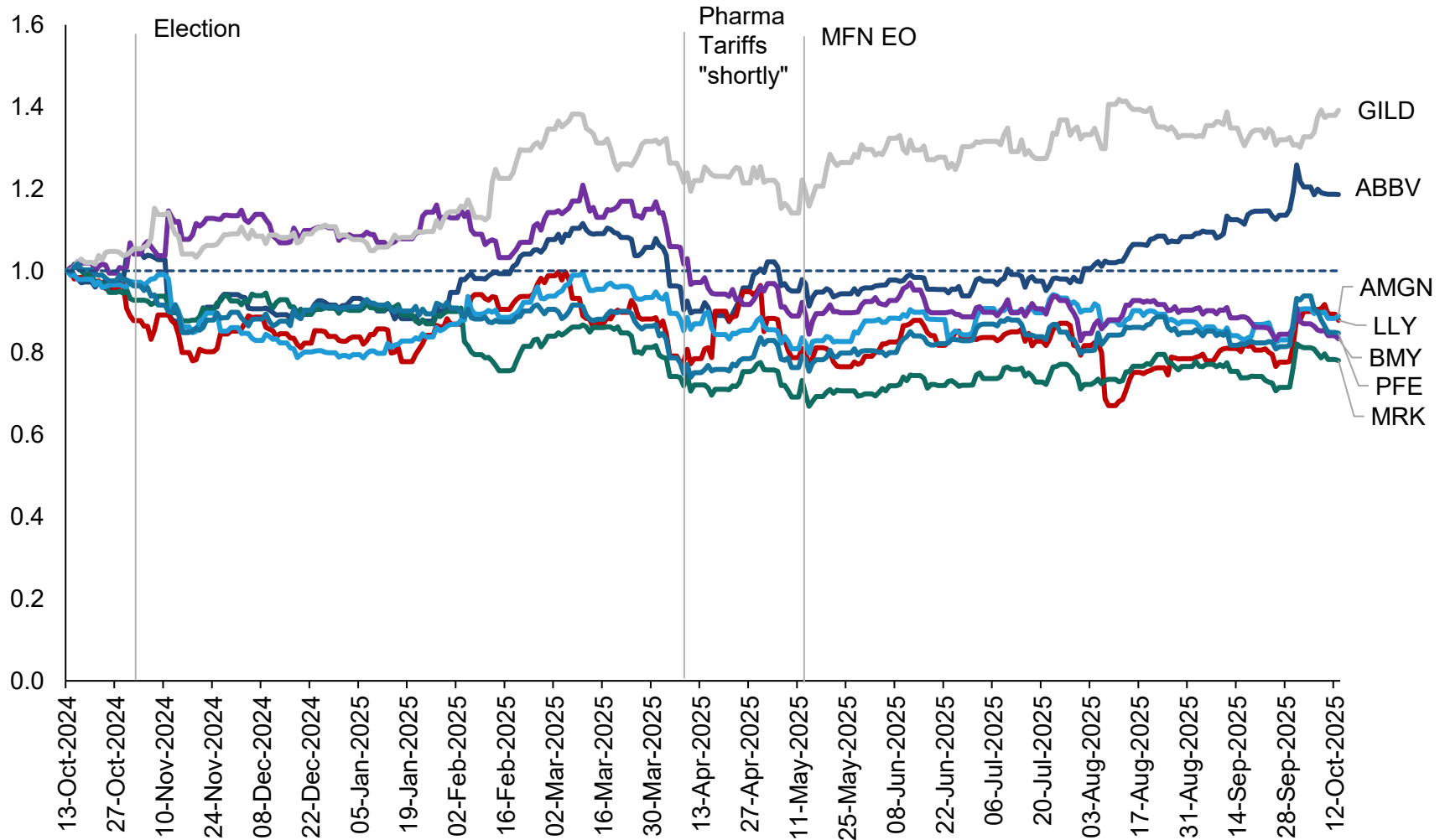
Sectoral Pressures: Dislocation of the sector (no longer defensive?)



Source: Bloomberg, Bernstein analysis

Sectoral Pressures: Dislocation of the sector (no longer defensive?)

Pharma performance vs SPX over past year

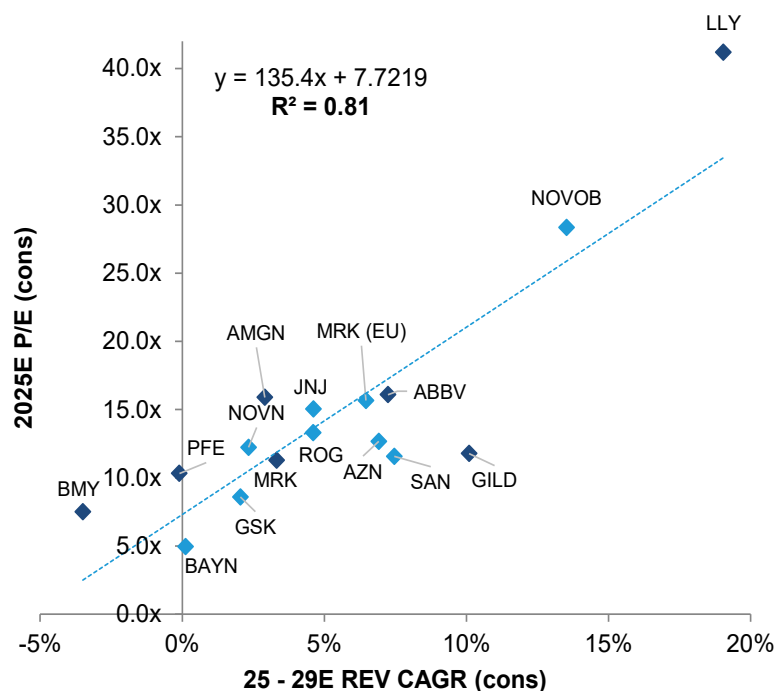


Source: Bloomberg, Bernstein analysis

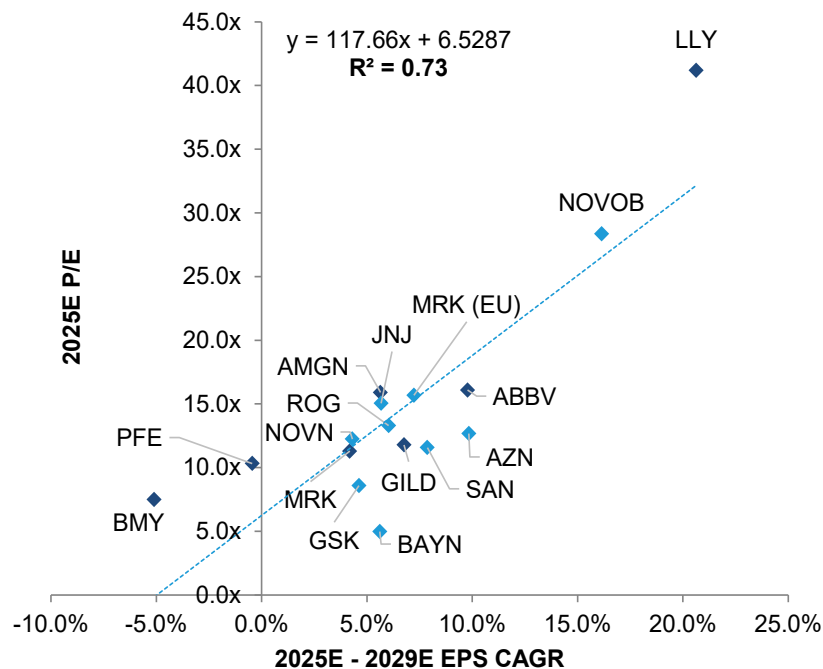
The market clearly rewards future revenue growth (as a marker of reinvention)

Stronger correlation to revenue growth owing to the willingness to forgo some earnings growth to R&D investment that spurs future revenue

P/E vs Revenue CAGR ($R^2 = 0.81$)



P/E vs EPS CAGR ($R^2 = 0.73$)



Source: Bloomberg, Bernstein analysis and estimates

What drives upside to pharma stocks...(usually)

Idiosyncratic

- Phase 3 data read-outs (sometimes earlier stages)
- Product specific revenue line beats for launch & growing assets (inconsequential for COVID, or late-life-cycle products)
- Upward revisions on guidance (esp. topline driven, excl. FX)
- M&A (later stage, particularly if pipeline gaps, risk of value destruction)
- Patent expiry exposure (in preceding 3-4y)
- Operating efficiency (but not enough to turn the tide)

More macro...

- Defensive place to hide...?
- Industry policy – especially drug pricing

What are the macro pressures on the industry?

Macro pressures on the industry today ...

**Section 232
investigation
& tariffs**



Could impact
operating margin

**Most favored
nation drug
pricing**



Could impact
topline

**FDA cuts
& changes**



Could slow down
drug approvals

Is there going to be a step-
change? Or slow erosion? Or no
change?

Are we at the bottom? Or could
sector valuations drop further?

Drug pricing has been the primary pressure on the sector, albeit with a relief rally post the PFE deal – we sense flexibility & some tailwinds

MFN for Medicaid



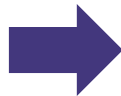
Medicaid is a small % of the market, already with the lowest prices

MFN for New Drug launches



The industry is very good at optimizing to the rules of the system

Deep discount for TrumpRx



Voluntary selection of products & variability on discount

What is MFN actually?

Lowest price in any country that has GDP per capita of 60% of US,
OR something more manageable?

**What do we look for
to identify strong
companies &
differentiated stock
perspectives?**

What do we look for?

What drives upside to pharma stocks...(usually)

Idiosyncratic	More macro...
<ul style="list-style-type: none">• Phase 3 data read-outs (sometimes earlier stages)• Product specific revenue line beats for launch & growing assets (inconsequential for COVID, or late-life-cycle products)• Upward revisions on guidance (esp. topline driven, excl. FX)• M&A (later stage, particularly if pipeline gaps)• Patent expiry exposure (in preceding 3-4y)	<ul style="list-style-type: none">• Defensive place to hide...?• Industry policy – especially drug pricing

BERNSTEIN | SOCIETE GENERALE GROUP

- LOE exposure – what's the set-up to support growth? And multiple compression?
- Pipeline potential – unmet need (size & SoC performance), differentiation of the asset; launch trajectory (differs by TA), regional opportunity
- Set-up for out-performing near term expectations... (earnings meets & beats) – especially welcome in this environment
- Management capability, behavior & M&A appetite
- Set-up relative to policy exposure & ability to navigate it (politically and operationally)

Bernstein US Biopharma expectations









Courtney Breen

Senior Analyst

Courtney.breen@bernsteinsg.com

+1(917)344-8407

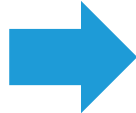


	Rating	TP	Stock moving catalysts	BernE
	OP	\$1100	<ol style="list-style-type: none"> GLP1 demand (weekly & quarterly...) / price erosion Orforglipron p3 data; Ret p3 data 	<ol style="list-style-type: none"> Near term demand doesn't impact peak, price elastic under-appreciated Orals are critical to TAM expansion, launch curve
	OP	\$120	<ol style="list-style-type: none"> Lenacapavir PrEP launch (mid-25) Reset of late stage devt & diversification strategy 	<ol style="list-style-type: none"> Confidence in launch plan (US & global) Low bar - just need to mitigate fears of value destruction
	OP	\$350	<ol style="list-style-type: none"> MariTide p2 data presentation MariTide p3 initiations 	1/2. While p2 full data will enlighten, critical data will come with p3; there's more "space" to play... Increased risk
	MP	\$62	<ol style="list-style-type: none"> Cobenfy launch & Alz-psychosis readout Growth product performance, M&A 	<ol style="list-style-type: none"> It's early (DoT, GTN, scripts), popn uncertainty Milvexian... waiting for the data card
	MP	\$95	<ol style="list-style-type: none"> M&A (substantive) [burning platform] Winrevair launch performance 	1. It's not in the recent behavior pattern, long-term orientation (2035-40)
	MP	\$203	<ol style="list-style-type: none"> Filling/advancing the pipeline Skyrizi & Rinvoq performance near term upside / low risk 	<ol style="list-style-type: none"> They have time, no clear movers LT Skyrizi and Rinvoq expectations well baked in
	MP	\$30	<ol style="list-style-type: none"> Harder to identify – so much to do Danuglipron...? 	<ol style="list-style-type: none"> No clear stock-movers, R&D day? Skepticism will persist around Danu
	MP	\$28	<ol style="list-style-type: none"> Vaccine policy risk receding Earnings performance 	<ol style="list-style-type: none"> Low probability due to high uncertainty Outperforming guidance isn't a strength

Source: Bernstein analysis and estimates

LLY: Why our top pick?

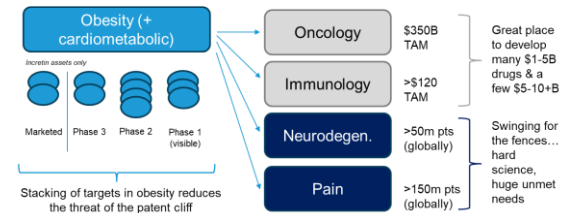
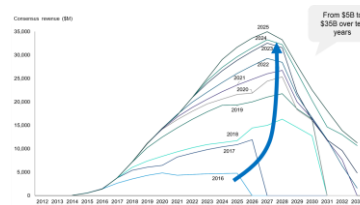
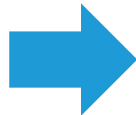
In the strongest position in the largest growing **TAM**



- Double digit growth is unique
- Price pressure – near / long-term

	P/E FY26	3y EPS CAGR	PEG
LLY	25.6	25%	1.03
ABBV	13.2	12%	1.10
MRK	7.8	6%	1.32
GILD	12.2	6%	1.93
AMGN	12.7	4%	3.55
BMJ	7.7	-7%	-1.15
PFE	7.4	-2%	-3.32

Unique set-up... highly **durable** growth



Good position to navigate near term **uncertainty**



Tariffs : flexibility

MFN : DTC

FDA disruption : Growth

Ticker	Rating	Cur	13 Oct 2025		TTM	Adjusted EPS				Adjusted P/E (x)		
			Closing	Price	Rel.	Cur	2024A	2025E	2026E	2024A	2025E	2026E
			Price	Target	Perf.							
ABBV	M	USD	230.30	203.00	5.2%	USD	10.10	11.96	14.05	22.8	19.3	16.4
LLY	O	USD	819.40	1,100.00	(25.5)%	USD	12.99	22.84	30.15	63.1	35.9	27.2
AMGN	O	USD	292.41	335.00	(24.3)%	USD	19.86	21.01	21.84	14.7	13.9	13.4
GILD	O	USD	118.21	135.00	25.8%	USD	4.61	8.16	8.87	25.6	14.5	13.3
MRNA	M	USD	26.74	28.00	(67.5)%	USD	(9.28)	(9.94)	(8.27)	(2.9)	(2.7)	(3.2)
PFE	M	USD	24.73	30.00	(28.6)%	USD	3.11	3.02	3.08	8.0	8.2	8.0
BMJ	M	USD	43.54	58.00	(30.0)%	USD	1.13	6.51	6.30	38.5	6.7	6.9
MRK	M	USD	85.70	95.00	(35.3)%	USD	7.64	8.93	9.55	11.2	9.6	9.0
SPX			6,552.51									

O - Outperform, M - Market-Perform, U - Underperform, NR - Not Rated, CS - Coverage Suspended

Source: Bloomberg, Bernstein estimates and analysis.

I. REQUIRED DISCLOSURES

References to "Bernstein" or the "Firm" in these disclosures relate to the following entities: Bernstein Institutional Services LLC (April 1, 2024 onwards), Sanford C. Bernstein & Co., LLC (pre April 1, 2024), Bernstein Autonomous LLP, BSG France S.A. (April 1, 2024 onwards), Sanford C. Bernstein (Hong Kong) Limited 盛博香港有限公司, Sanford C. Bernstein (Canada) Limited, Sanford C. Bernstein (India) Private Limited (SEBI registration no. INH000006378), Sanford C. Bernstein (Singapore) Private Limited and Sanford C. Bernstein Japan KK (サンフォード・C・バーンスタイン株式会社).

On April 1, 2024, Société Générale (SG) and AllianceBernstein, L.P. (AB) completed a transaction that created a new joint venture in which their respective cash equities and research businesses operate in a new business combination. Although their respective ownership percentages in the joint venture differ between North America and the rest of the world, the creation, production and publication of research is handled collaboratively on a global basis across the two research brands, "Bernstein" and "Autonomous". Unless specifically noted otherwise, for purposes of these disclosures, references to Bernstein's "affiliates" relate to both SG and AB and their respective affiliates.

VALUATION METHODOLOGY

This research publication covers six or more companies. For valuation methodology and other company disclosures:

Please visit: <https://bernstein-autonomous.bluematrix.com/sellside/Disclosures.action>.

Or, you can also write to the Director of Compliance, Bernstein Institutional Services LLC, 245 Park Avenue, New York, NY 10167.

RISKS

This research publication covers six or more companies. For risks and other company disclosures:

Please visit: <https://bernstein-autonomous.bluematrix.com/sellside/Disclosures.action>.

Or, you can also write to the Director of Compliance, Bernstein Institutional Services LLC, 245 Park Avenue, New York, NY 10167.

RATINGS DEFINITIONS, BENCHMARKS AND DISTRIBUTION

EQUITY RATINGS DEFINITIONS

Bernstein brand

The Bernstein brand rates stocks based on forecasts of relative performance for the next 12 months versus the S&P 500 for stocks listed on the U.S. and Canadian exchanges, versus the Bloomberg Europe Developed Markets Large and Mid Cap Price Return Index (EDM) for stocks listed on the European exchanges and emerging markets exchanges outside of the Asia Pacific region, versus the Bloomberg Japan Large and Mid Cap Price Return Index USD (JP) for stocks listed on the Japanese exchanges, and versus the Bloomberg Asia ex-Japan Large and Mid Cap Price Return Index (ASIA) for stocks listed on the Asian (ex-Japan) exchanges -unless otherwise specified.

The Bernstein brand has three categories of ratings:

- Outperform: Stock will outpace the market index by more than 15 pp
- Market-Perform: Stock will perform in line with the market index to within +/- 15 pp

- Underperform: Stock will trail the performance of the market index by more than 15 pp

Coverage Suspended: Coverage of a company under the Bernstein research brand has been suspended. Ratings and price targets are suspended temporarily, are no longer current, and should therefore not be relied upon.

Not Rated: A rating assigned when the stock cannot be accurately valued, or the performance of the company accurately predicted, at the present time. The covering analyst may continue to publish research reports on the company to update investors on events and developments.

Not Covered (NC) denotes companies that are not under coverage.

Bernstein brand stock ratings are based on a 12-month time horizon.

Autonomous brand – common stocks

The Autonomous brand rates common stocks as indicated below. As our benchmarks we use the Bloomberg Europe 500 Banks And Financial Services Index (BEBANKS) and Bloomberg Europe Dev Mkt Financials Large and Mid Cap Price Ret Index EUR (EDMFI) index for developed European banks and Payments, the Bloomberg Europe 500 Insurance Index (BEINSUR) for European insurers, the S&P 500 and S&P Financials for US banks and Payments coverage, S5LIFE for US Insurance, the S&P Insurance Select Industry (SPSIINS) for US Non-Life Insurers coverage, and the Bloomberg Emerging Markets Financials Large, Mid and Small Cap Price Return Index (EMLSF) for emerging market banks and insurers and Payments. Ratings are stated relative to the sector (not the market).

The Autonomous brand has three categories of common stock ratings:

- Outperform (OP): Stock will outpace the relevant index by more than 10 pp
- Neutral (N): Stock will perform in line with the market index to within +/-10 pp
- Underperform (UP): Stock will trail the performance of the relevant index by more than 10 pp

Coverage Suspended: Coverage of a company under the Autonomous research brand has been suspended. Ratings and price targets are suspended temporarily, are no longer current, and should therefore not be relied upon.

Not Rated: A rating assigned when the stock cannot be accurately valued, or the performance of the company accurately predicted, at the present time. The covering analyst may continue to publish research reports on the company to update investors on events and developments.

Those denoted as 'Feature' (e.g., Feature Outperform FOP, Feature Under Outperform FUP) are our core ideas.

Not Covered (NC) denotes companies that are not under coverage.

Autonomous brand common stock ratings are based on a 12-month time horizon.

Autonomous brand – preferred stocks

The Autonomous brand has three categories of preferred stock ratings:

- Outperform (OP): The total return of the preferred instrument is expected to outperform preferred securities of other issuers operating in similar sectors or rating categories over the next six months.
- Neutral (N): The total return of the preferred instrument is expected to perform in line with preferred securities of other issuers operating in similar sectors or rating categories over the next six months.
- Underperform (UP): The total return of the preferred instrument is expected to underperform preferred securities of other issuers operating in similar sectors or rating categories over the next six months.

Autonomous preferred stock ratings are based on a 6-month time horizon.

AUTONOMOUS CREDIT RESEARCH

Where this report contains investment recommendations for credit instruments, as defined in article 3(1)(35) of the Market Abuse Regulation, the information below is presented to comply with its disclosure requirements.

The report may also include reference(s) to published opinions by other Autonomous or Bernstein analysts covering the equity securities of the issuer(s) referenced herein. Please note an investment recommendation for credit instruments published by the author(s) of this report may differ from the published view of the analyst covering equity securities for the issuer(s) contained in this report and vice versa.

CREDIT RATINGS DEFINITIONS

The Autonomous brand has three categories of credit ratings:

- Credit Outperform (C-OP): The total return of the Reference Credit Instrument is expected to outperform the credit spread of bonds of other issuers operating in similar sectors or rating categories over the next six months.
- Credit Neutral (C-N): The total return of the Reference Credit Instrument is expected to perform in line with the credit spread of bonds of other issuers operating in similar sectors or rating categories over the next six months.
- Credit Underperform (C-UP): The total return of the Reference Credit Instrument is expected to underperform the credit spread of bonds of other issuers operating in similar sectors or rating categories over the next six months.

Autonomous credit ratings are based on a 6-month time horizon.

A list of all investment recommendations produced by the author(s) of this report alongside credit ratings history are available upon request.

It is at the sole discretion of the Firm as to when to initiate, update and cease research coverage. The Firm has established, maintains and relies on information barriers to control the flow of information contained in one or more areas (i.e. the private side) within the Firm, and into other areas, units, groups or affiliates (i.e. public side) of the Firm

DISTRIBUTION OF EQUITY RATINGS/INVESTMENT BANKING SERVICES

Rating	Market Abuse Regulation (MAR) and FINRA Rule 2241 classification	Count	Percent	Count*	Percent*
Outperform	BUY	620	51.07%	112	18.06%
Market-Perform (Bernstein Brand)	HOLD	420	34.60%	81	19.29%
Neutral (Autonomous Brand)					
Underperform	SELL	174	14.33%	19	10.92%

* These figures represent the number and percentage of companies in each category to whom Bernstein and Autonomous provided investment banking services. As of September 30, 2025. All figures are updated quarterly.

PRICE CHARTS/ RATINGS AND PRICE TARGET HISTORY

This research publication covers six or more companies. For price chart and other company disclosures, please visit <https://bernstein-autonomous.bluematrix.com/sellside/Disclosures.action> or you can write to the Director of Compliance, Bernstein Institutional Services LLC, 245 Park Avenue, New York, NY 10167.

CONFLICTS OF INTEREST

SG and/or its affiliates beneficially own 1% or more of a class of common equity securities of the following company: Moderna Inc.

Bernstein Autonomous LLP or BSG France SA, beneficially, has either a net long or short position of 0.5% or more of the total issued share capital of a class of common equity securities of the following MiFID eligible securities: Eli Lilly & Co.

Bernstein and/or affiliates have received compensation for investment banking services in the past twelve months from AbbVie Inc.

Bernstein and/or affiliates have received compensation for investment banking services in the past twelve months from Gilead Sciences Inc.

Bernstein and/or affiliates have received compensation for non-investment banking securities-related products or services in the previous twelve months from the following clients: AbbVie Inc, Merck & Co Inc, Bristol-Myers Squibb Co, Gilead Sciences Inc, Pfizer Inc and Amgen Inc.

An affiliate of Bernstein has received compensation for non-investment banking securities-related products or services in the previous twelve months from the following clients: Merck & Co Inc, Gilead Sciences Inc and Pfizer Inc.

Affiliates of Bernstein managed or co-managed in the past twelve months a public offering of securities of AbbVie Inc and Gilead Sciences Inc.

Bernstein and/or affiliates had an investment banking client relationship during the past twelve months with AbbVie Inc and Gilead Sciences Inc.

Certain affiliates of Bernstein act as market maker or liquidity provider in the equities securities of: AbbVie Inc, Merck & Co Inc, Eli Lilly & Co, Bristol-Myers Squibb Co, Gilead Sciences Inc, Pfizer Inc and Amgen Inc.

Certain affiliates of Bernstein act as market maker or liquidity provider in the debt securities of: AbbVie Inc, Merck & Co Inc, Eli Lilly & Co, Pfizer Inc and Amgen Inc.

OTHER MATTERS

The legal entity(ies) employing the analyst(s) listed in this report, and their location, can be determined by the country code of their phone number, as follows:

+1 Bernstein Institutional Services LLC; New York, New York, USA

+44 Bernstein Autonomous LLP; London UK

+33 BSG France S.A.; Paris, France

+34 BSG France S.A.; Madrid, Spain

+41 Bernstein Autonomous LLP; Geneva, Switzerland

+49 BSG France S.A.; Frankfurt, Germany

+91 Sanford C. Bernstein (India) Private Limited; Mumbai, India

+852 Sanford C. Bernstein (Hong Kong) Limited 盛博香港有限公司; Hong Kong, China

+65 Sanford C. Bernstein (Singapore) Private Limited; Singapore

+81 Sanford C. Bernstein Japan KK; Tokyo, Japan

Where this report has been prepared by research analyst(s) employed by a non-US affiliate, such analyst(s), is/are (unless otherwise expressly noted below) not registered as associated persons of Bernstein Institutional Services LLC or any other SEC-registered broker-dealer and are not licensed or qualified as research analysts with FINRA. Accordingly, such analyst(s) may not be subject to FINRA's restrictions regarding (among other things) communications by research analysts with a subject company, interactions between research analysts and investment banking personnel, participation by research analysts in solicitation and marketing activities relating to investment banking transactions, public appearances by research analysts, and trading securities held by a research analyst account.

CERTIFICATION

Each research analyst listed in this report, who is primarily responsible for the preparation of the content of this report, certifies that all of the views expressed in this publication accurately reflect that analyst's personal views about any and all of the subject securities or issuers and that no part of that analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views in this publication.

II. ADDITIONAL GLOBAL CONFLICT DISCLOSURES

It is at the sole discretion of the Firm as to when to initiate, update and cease research coverage. The Firm has established, maintains and relies on information barriers to control the flow of information contained in one or more areas (i.e., the private side) within the Firm, and into other areas, units, groups or affiliates (i.e., public side) of the Firm.

III. OTHER IMPORTANT INFORMATION AND DISCLOSURES

Separate branding is maintained for “Bernstein” and “Autonomous” research products.

- Bernstein produces a number of different types of research products including, among others, fundamental analysis and quantitative analysis under both the “Autonomous” and “Bernstein” brands. Recommendations contained within one type of research product may differ from recommendations contained within other types of research products, whether as a result of differing time horizons, methodologies or otherwise. Furthermore, views or recommendations within a research product issued under one brand may differ from views or recommendations under the same type of research product issued under the other brand. The Research Ratings System for the two brands and other information related to those Rating Systems are included in the previous section.
- Autonomous operates as a separate business unit within the following entities: Bernstein Institutional Services LLC, Bernstein Autonomous LLP, Sanford C. Bernstein (Hong Kong) Limited 盛博香港有限公司 and Sanford C. Bernstein (India) Private Limited. For information relating to “Autonomous” branded products (including certain Sales materials) please visit: www.autonomous.com. For information relating to Bernstein branded products please visit: www.bernsteinresearch.com.

Analysts are compensated based on aggregate contributions to the research franchise as measured by account penetration, productivity and proactivity of investment ideas. No analysts are compensated based on performance in, or contributions to, generating investment banking revenues.

This report has been produced by an independent analyst as defined in Article 3 (1)(34)(i) of EU 596/2014 Market Abuse Regulation (“MAR”) and the same article of MAR as it forms part of United Kingdom domestic law by virtue of the European Union (Withdrawal) Act 2018.

To our readers in the United States: Bernstein Institutional Services LLC, a broker-dealer registered with the U.S. Securities and Exchange Commission (“SEC”) and a member of the U.S. Financial Industry Regulatory Authority, Inc. (“FINRA”) is distributing this publication in the United States and accepts responsibility for its contents. Where this material contains an analysis of debt product(s), such material is intended only for institutional investors and is not subject to the US independence and disclosure standards applicable to debt research prepared for retail investors.

Bernstein Institutional Services LLC may act as principal for its own account or as agent for another person (including an affiliate) in sales or purchases of any security which is a subject of this report. This report does not purport to meet the objectives or needs of any specific individuals, entities or accounts.

To our readers in Canada: If this publication pertains to a Canadian domiciled company, it is being distributed in Canada by Sanford C. Bernstein (Canada) Limited, which is licensed and regulated by the Canadian Investment Regulatory Organization. If the publication pertains to a non-Canadian domiciled company, it is being distributed by Bernstein Institutional Services LLC, which is licensed and regulated by both the SEC and FINRA, into Canada under the International Dealers Exemption.

This document may not be passed onto any person in Canada unless that person qualifies as “permitted client” as defined in Section 1.1 of NI 31-103.

To our readers in Brazil: This report has been prepared by Bernstein Institutional Services LLC, and Banco BTG Pactual S.A. (“BTG”) is responsible for the distribution of this report in Brazil.

To readers in the United Kingdom: This publication has been issued or approved for issue in the United Kingdom by Bernstein Autonomous LLP, authorised and regulated by the Financial Conduct Authority and located at 60 London Wall, London EC2M 5SH, +44 (0)20-7170-5000. Registered in England & Wales No OC343985.

This document is for distribution only to persons who (i) have professional experience in matters relating to investments falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended, the “Financial Promotion Order”), (ii) are persons falling within Article 49(2)(a) to (d) (“high net worth companies, unincorporated associations, etc.”) of the Financial Promotion Order, (iii) are outside the United Kingdom, or (iv) are persons to whom an invitation or inducement to engage in

investment activity (within the meaning of section 21 of the FSMA) in connection with the issue or sale of any securities may otherwise lawfully be communicated or caused to be communicated (all such persons together being referred to as “relevant persons”). This document is directed only at relevant persons and must not be acted on or relied on by persons who are not relevant persons. Any investment or investment activity to which this document relates is available only to relevant persons and will be engaged in only with relevant persons.

To our readers in the member states of the EEA: This publication is being distributed by BSG France SA, which is authorised and regulated by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and Autorité des Marchés Financiers (AMF).

To our readers in Hong Kong: This publication is being distributed in Hong Kong by Sanford C. Bernstein (Hong Kong) Limited 盛博香港有限公司, which is licensed and regulated by the Hong Kong Securities and Futures Commission (Central Entity No. AXC846) to carry out Type 4 (Advising on Securities) regulated activities and subject to the licensing conditions mentioned in the SFC Public Register (<https://www.sfc.hk/publicregWeb/corp/AXC846/details>). This publication is solely for professional investors, as defined in the Securities and Futures Ordinance (Cap. 571).

To our readers in Singapore: This publication is being distributed in Singapore by Sanford C. Bernstein (Singapore) Private Limited, only to accredited investors or institutional investors, as defined in the Securities and Futures Act 2001 of Singapore (“SFA”). Recipients in Singapore should contact Sanford C. Bernstein (Singapore) Private Limited in respect of matters arising from, or in connection with, this publication. Sanford C. Bernstein (Singapore) Private Limited is regulated by the Monetary Authority of Singapore and licensed under the SFA as a capital markets services licence holder for dealing in capital markets products that are securities and collective investment schemes and an exempt financial adviser for advising on, issuing and promulgating analyses and reports on securities. Sanford C. Bernstein (Singapore) Private Limited is registered in Singapore with Company Registration No. 20213710W and located at One Raffles Quay, #27-11 South Tower, Singapore 048583, +65-6230-4612.

To our readers in the People’s Republic of China: The securities referred to in this document are not being offered or sold and may not be offered or sold, directly or indirectly, in the People’s Republic of China (for such purposes, not including the Hong Kong and Macau Special Administrative Regions or Taiwan, the “PRC”) in contravention of any applicable laws of the PRC.

This document does not constitute an offer to sell or the solicitation of an offer to buy any securities in the PRC to any person to whom it is unlawful to make the offer or solicitation in the PRC.

We do not represent that this document may be lawfully distributed, or that any securities may be lawfully offered, in compliance with any applicable registration or other requirements in the PRC, or pursuant to an exemption available thereunder, or assume any responsibility for facilitating any such distribution or offering. In particular, no action has been taken by us which would permit a public offering of any securities or distribution of this document in the PRC. Accordingly, the securities are not being offered or sold within the PRC by means of this document or any other document. Neither this document nor any advertisement or other offering material may be distributed or published in the PRC, except under circumstances that will result in compliance with any applicable laws and regulations.

To our readers in Japan: This publication is being distributed in Japan by Sanford C. Bernstein Japan KK (サンフォード・C・バーンスタイン株式会社), which is registered in Japan as a Financial Instruments Business Operator with the Kanto Local Finance Bureau (registration number: The Director-General of Kanto Local Finance Bureau (FIBO) No.3387) and regulated by the Financial Services Agency. It is also a member of Japan Investment Advisers Association. This publication is solely for qualified institutional investors in Japan only, as defined in Article 2, paragraph (3), items (i) of the Financial Instruments and Exchange Act.

For the institutional client readers in Japan who have been granted access to the Bernstein website by Daiwa Securities Group Inc. (“Daiwa”), your access to this document should not be construed as meaning that Bernstein is providing you with investment advice for any purposes. Whilst Bernstein has prepared this document, your relationship is, and will remain with, Daiwa, and Bernstein has neither any contractual relationship with you nor any obligations towards you.

To our readers in Australia: Sanford C. Bernstein (Hong Kong) Limited 盛博香港有限公司 is responsible for distributing research in Australia. It is regulated by the Securities and Exchange Commission under U.S. laws, by the Financial Conduct Authority under U.K. laws, which differs from Australian laws. Sanford C. Bernstein (Hong Kong) Limited

盛博香港有限公司 is exempt from the requirement to hold an Australian financial services license under the Corporations Act 2001 in respect of the provision of the following financial services to wholesale clients:

- providing financial product advice;
- dealing in a financial product;
- making a market for a financial product; and
- providing a custodial or depository service.

To our readers in India: This publication is being distributed in India by Sanford C. Bernstein (India) Private Limited (SCB India) which is licensed and regulated by Securities and Exchange Board of India ("SEBI") as a research analyst entity under the SEBI (Research Analyst) Regulations, 2014, having registration no. INH000006378 and as a stock broker having registration no. INZ000213537. SCB India is currently engaged in the business of providing research and stock broking services. Please refer to www.bernsteinresearch.in for more information.

- SCB India is a Private limited company incorporated under the Companies Act, 2013, on April 12, 2017 bearing corporate identification number U65999MH2017FTC293762, and registered office at Level 3A, 4th Floor, First International Financial Centre, Plot Nos C-54 and C-55, G Block, Near CBI Office, Bandra Kurla Complex, Bandra (East), Mumbai 400098, Maharashtra, India (Phone No: +91-22-68421401).
- For details of Associates (i.e., affiliates/group companies) of SCB India, kindly email MUM-BERNSTEIN-InCompliance@bernsteinsg.com.
- SCB India does not have any disciplinary history as on the date of this report.
- Except as noted above, SCB India and/or its Associates (i.e., affiliates/group companies), the Research Analysts authoring this report, and their relatives
 - do not have any financial interest in the subject company
 - do not have actual/beneficial ownership of one percent or more in securities of the subject company;
 - is not engaged in any investment banking activities for Indian companies, as such;
 - have not managed or co-managed a public offering in the past twelve months for any Indian companies;
 - have not received any compensation for investment banking services or merchant banking services from the subject company in the past 12 months;
 - have not received compensation for brokerage services from the subject company in the past twelve months;
 - have not received any compensation or other benefits from the subject company or third party related to the specific recommendations or views in this report; and
 - do not currently, but may in the future, act as a market maker in the financial instruments of the companies covered in the report.

- do not have any conflict of interest in the subject company as of the date of this report.
- Except as noted above, the subject company has not been a client of SCB India during twelve months preceding the date of distribution of this research report. Neither SCB India nor its Associates (i.e., affiliates/group companies) have received compensation for products or services other than investment banking, merchant banking or brokerage services from the subject company in the past twelve months.
- The principal research analyst(s) who prepared this report, members of the analysts' team, and members of their households are not an officer, director, employee or advisory board member of the companies covered in the report.
- Our Compliance officer / Grievance officer is Ms. Rupal Talati, who can be reached at +91-22-68421451, or MUM-BERNSTEIN-InCompliance@bernsteinsg.com / Scbin-investorgrievance@bernsteinsg.com
- The investor charter of SCB India is available on its website and may be accessed at [Sanford C. Bernstein \(India\) Private Limited \(bernsteinresearch.in\)](http://Sanford.C.Bernstein.India.Private.Limited.bernsteinresearch.in)
- Disclaimer: Registration granted by SEBI, and certification from NISM, is in no way a guarantee of performance of the intermediary or provide any assurance of returns to investors. Investments in securities market are subject to market risks. Read all the related documents carefully before investing.

To our readers in Switzerland: This document is provided in Switzerland by or through Bernstein Autonomous LLP, and is provided only to qualified investors as defined in article 10 of the Swiss Collective Investment Scheme Act ("CISA") and related provisions of the Collective Investment Scheme Ordinance and in strict compliance with applicable Swiss law and regulations. The products mentioned in this document may not be suitable for all types of investors. This document is based on the Directives on the Independence of Financial Research issued by the Swiss Bankers Association (SBA) in January 2008.

To our readers in the Middle East: Bernstein Autonomous LLP, DIFC branch has its principal office at Gate Village 06, DIFC, Dubai, UAE. Bernstein Autonomous LLP, DIFC branch is regulated by the Dubai Financial Services Authority (DFSA) with the registration number F008549 and is provisioned for Arranging Deals in Investments and Advising on Financial Products. All communications and services are directed at Professional Clients and Market Counterparties only (as defined in the DFSA rulebook). Persons other than Professional Clients and Market Counterparties, such as Retail Clients, are not the intended recipients of our communications or services.

LEGAL

All research publications are disseminated to our clients through posting on the firm's password protected websites, bernsteinresearch.com and autonomous.com. Certain, but not all, research publications are also made available to clients through third-party vendors or redistributed to clients through alternate electronic means as a convenience.

This publication has been published and distributed in accordance with the Firm's policy for management of conflicts of interest in investment research, a copy of which is available from Bernstein Institutional Services LLC, Director of Compliance, 245 Park Avenue, New York, NY 10167. Additional disclosures and information regarding Bernstein's business are available on our website www.bernsteinresearch.com.

The securities described herein may not be eligible for sale in all jurisdictions or to certain categories of investors where that permission profile is not consistent with the licenses held by the entities noted herein. This document is for distribution only as may be permitted by law. This publication is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of, or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or which would subject any of the entities referenced herein or any of their subsidiaries or affiliates to any registration or licensing requirement within such jurisdiction. This publication is based upon public sources we believe to be reliable, but no representation is made by us that the publication is accurate or complete. We do not undertake to advise you of any change in the reported information or in the opinions herein. This publication was prepared and issued by entity referred to herein for

distribution to eligible counterparties or professional clients. This publication is not an offer to buy or sell any security, and it does not constitute investment, legal or tax advice. The investments referred to herein may not be suitable for you. Investors must make their own investment decisions in consultation with their professional advisors in light of their specific circumstances. The value of investments may fluctuate, and investments that are denominated in foreign currencies may fluctuate in value as a result of exposure to exchange rate movements. Information about past performance of an investment is not necessarily a guide to, indicator of, or assurance of, future performance.

This report is directed to and intended only for our clients who are “eligible counterparties”, “professional clients”, “institutional investors” and/or “professional investors” as defined by the aforementioned regulators, and must not be redistributed to retail clients as defined by the aforementioned regulators. Retail clients who receive this report should note that the services of the entities noted herein are not available to them and should not rely on the material herein to make an investment decision. The result of such act will not hold the entities noted herein liable for any loss thus incurred as the entities noted herein are not registered/authorised/ licensed to deal with retail clients and will not enter into any contractual agreement/arrangement with retail clients. This report is provided subject to the terms and conditions of any agreement that the clients may have entered into with the entities noted herein. All research reports are disseminated on a simultaneous basis to eligible clients through electronic publication to our client portal. The information is private and confidential and for the use of the clients only.

This report has been prepared for information purposes only and is based on current public information that we consider reliable, but the entities noted herein do not warrant or represent (express or implied) as to the sources of information or data contained herein are accurate, complete, not misleading or as to its fitness for the purpose intended even though the entities noted herein rely on reputable or trustworthy data providers, it should not be relied upon as such. Opinions expressed are the author(s)’ current opinions as of the date appearing on the material only and we do not undertake to advise you of any change in the reported information or in the opinions herein.

This publication was prepared and issued by the entity referred to herein for distribution to eligible counterparties or professional clients. The information in this report is intended for general circulation and does not constitute an offer to buy or sell any security, investment, legal or tax advice nor a personal recommendation, as defined by any of the aforementioned regulators. It does not take into account the particular investment objectives, financial situations, or needs of individual investors. The report has not been reviewed by any of the aforementioned regulators and does not represent any official recommendation from the aforementioned regulators. The investments referred to herein may not be suitable for you. Investors must make their own investment decisions in consultation with advice sought from a financial adviser regarding the suitability of the investment product, taking into account the specific investment objectives, financial situation or particular needs of any recipient of the recommendation, before the recipient makes a commitment to purchase the investment product.

The analysis contained herein is based on numerous assumptions. Different assumptions could result in materially different results. The information in this report does not constitute, or form part of, any offer to sell or issue, or any offer to purchase or subscribe for shares, or to induce engage in any other investment activity. The value of any securities or financial instruments mentioned in this report may fluctuate subject to market conditions. Information about past performance of an investment is not necessarily a guide to, indicative of, or assurance of future performance. Estimates of future performance mentioned by the research analyst in this report are based on assumptions that may not be realized due to unforeseen factors like market volatility/fluctuation. In relation to securities or financial instruments denominated in a foreign currency other than the clients’ home currency, movements in exchange rates will have an effect on the value, either favorable or unfavorable. Before acting on any recommendations in this report, recipients should consider the appropriateness of investing in the subject securities or financial instruments mentioned in this report and, if necessary, seek for independent professional advice.

The securities described herein may not be eligible for sale in all jurisdictions or to certain categories of investors where that permission profile is not consistent with the licenses held by the entities noted herein. This document is for distribution only as may be permitted by law. It is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or would subject the entities noted herein to any regulation or licensing requirement within such jurisdiction.

Source: Bloomberg Index Services Limited. BLOOMBERG® is a trademark and service mark of Bloomberg Finance L.P. and its affiliates (collectively “Bloomberg”). Bloomberg or Bloomberg’s licensors own all proprietary rights in the Bloomberg Indices. Neither Bloomberg nor Bloomberg’s licensors approves or endorses this material, or guarantees the accuracy or completeness of any information herein, or makes any warranty, express or implied, as to the results to be obtained therefrom and, to the maximum extent allowed by law, neither shall have any liability or responsibility for injury or damages arising in connection therewith.

No part of this material may be reproduced, distributed or transmitted or otherwise made available without prior consent of the entities noted herein. Copyright Bernstein Institutional Services LLC Bernstein Autonomous LLP, BSG France S.A., Sanford C. Bernstein (Hong Kong) Limited 盛博香港有限公司, Sanford C. Bernstein (Canada) Limited, Sanford C. Bernstein (India) Private Limited (SEBI registration no. INH000006378), Sanford C. Bernstein (Singapore) Private Limited and Sanford C. Bernstein Japan KK (サンフォード・C・バーンスタイン株式会社). All rights reserved. The trademarks and service marks contained herein are the property of their respective owners. Any unauthorized use or disclosure is strictly prohibited. The entities noted herein may pursue legal action if the unauthorized use results in any defamation and/or reputational risk to the entities noted herein and research published under the Bernstein and Autonomous brands.