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TRIVARIATE RESEARCH

AN ASSESSMENT OF REVENUE GROWTH

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SUMMARY

With the NASDAQ down 25% year-to-date and many individual securities down 50-80% over the last 15 months, expectations about future revenue growth have been meaningfully altered, and frankly, the growth outlook is particularly uncertain. We have no doubt that 2022 and 2023 revenue growth will be important determinants for ultimate winners and losers in the stock market, and that is the catalyst for today's research.

In the last two weeks we analyzed 100 years of daily returns of the SP500 to provide context around the market sell-off and we studied cyclical industries to look for opportunities where forward estimate assumptions and current valuations may offer relative opportunities. Today, we thought it prudent to take an unemotional look at longer-term revenue growth trends, multiples, and near-term expectations for growth to see if the meaningful market pull-back implies any relative opportunities. While quantitative tightening requires a different investing roadmap than quantitative easing, we do not believe all innovation is dead. Even if growth stocks continue to lag until any directionally dovish commentary surfaces, we want to provide "growth-neutral" pair trades for stock pickers in this environment.

Expectations higher than history: We analyzed 20-,10-,5-,3-, and 1-year revenue growth trends, as well as the forward revenue estimates for every stock surviving those horizons and grossed up the bottom-up data for every sub-industry, industry, and sector over time. Over the trailing 10-years, biotech, media, internet retail, software, and health care technology were the fastest growing sub-industries. Energy equipment and services, gas, electric utilities, multi-utilities, and airlines were the slowest growing. When we assess the 12-month forward revenue growth estimates vs. these 10-year trends, airlines, oil, gas & consumable fuels, energy equipment & services, hotels, restaurants, and leisure, and semiconductors are forecasted to grow most quickly vs. history. Our judgment is that the low 10-year growth in airlines and energy correlated to underinvestment that is now the reason these industries are likely to grow above trend for the foreseeable future.

Expectations lower than history: On the flip side, biotechnology, transportation infrastructure, tobacco, pharma, and paper & forest products are forecasted to grow more slowly than history. All of these make logical sense to us, though biotechnology stands out as an area where potential expectations for future growth seem potentially excessively low.

SUMMARY AND CONCLUSIONS

Peak-to-trough: We analyzed the last five peak-to-trough revenue declines for every industry in the last 25 years for context. Autos, energy, and food, beverages & tobacco historically have the biggest declines, while commercial services, capital good and retailing the lowest. We were surprised to see this for food, beverages & tobacco, an area we see high valuation, rising input costs, and a strong dollar as directional negatives. We could see autos capital goods, software, and retailing have revenue pullbacks as severe as the last five biggest declines, but most industries will fare better this cycle.

Valuation: Expectations about future revenue growth rates and profitability drive price-to-sales levels and changes. We compared trailing and forward price-to-sales multiples to provide context around today's valuation levels and "implied" multiples various scenarios. Biotech and pharma look cheap, and autos expensive in this scenario. While obviously this is an academic exercise and underlying trends evolve, we think the future about growth is particularly uncertain right now, and the context around historical growth and peak-to-trough declines is instructive.

Conclusion: When canvassing historical growth rates, expectations, peak-to-trough declines and current valuations, we see some investment opportunities.

Buys: Airlines, biotech, metal and mining, and energy.

Sells: Machinery, food, beverages & household products, autos, software

Stock ideas are shown on slide 14.

If you are interested in the underlying analysis, please email us.

RELATIVE TO HISTORY, BIOTECH EXPECTATIONS LOW, AIRLINES HIGH

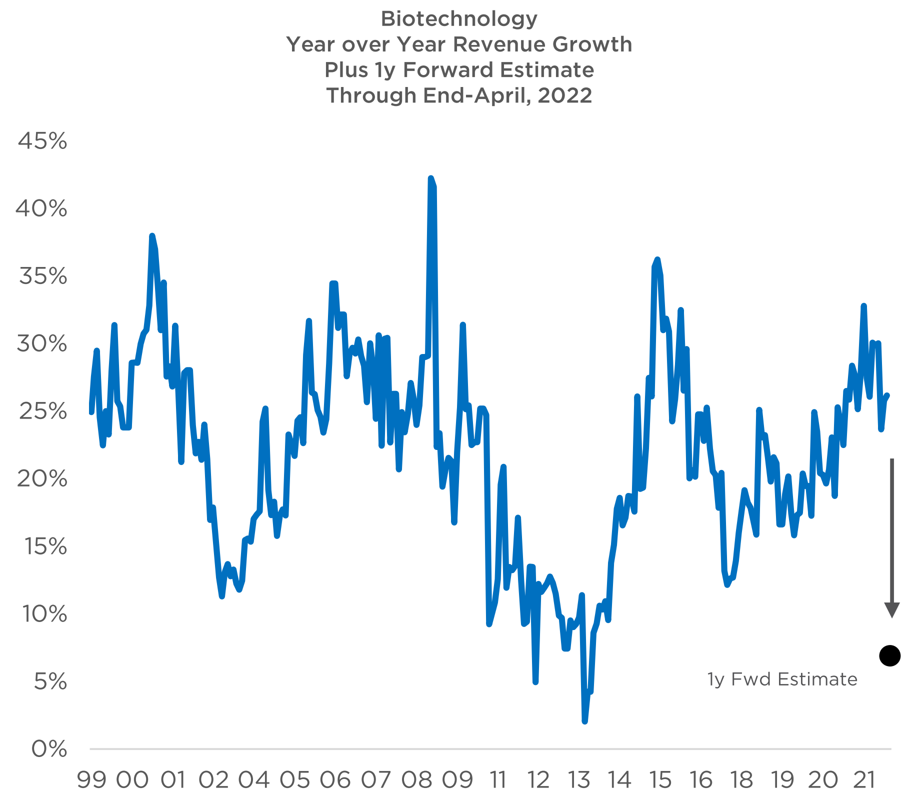
We analyzed long-term revenue growth trends bottom-up. Biotech expectations are low vs. history, and airlines and energy are high. That probably makes sense as airlines and energy equipment have the lowest 10-year trailing revenue growth of any sub-industries, and that translated to underinvestment that now drives growth. Biotech expectations now seem depressed.

Historical Revenue Growth Over Various Horizons
Versus 1y Fwd. Revenue Growth
Sub-Industries With Largest and Smallest Differentials

Sub-Industry	10y	5y	3y	1y	1y Fwd.	Delta of Fwd Estimate vs. 10y Revenue Growth
Biotechnology	19.6%	21.2%	23.1%	27.8%	6.9%	(12.7%)
Transportation Infrastructure	7.2%	(1.0%)	(10.7%)	(27.4%)	0.0%	(7.2%)
Tobacco	3.5%	5.6%	4.8%	7.6%	(3.2%)	(6.6%)
Pharmaceuticals	14.3%	9.5%	10.6%	14.5%	8.0%	(6.3%)
Paper & Forest Products	3.4%	4.1%	3.8%	15.3%	(2.1%)	(5.5%)
Independent Power & Renewable Electricity Producers	12.8%	5.6%	5.3%	10.2%	11.0%	(1.8%)
Air Freight & Logistics	8.2%	10.3%	9.8%	20.4%	6.5%	(1.7%)
Electric Utilities	2.1%	2.6%	2.2%	7.4%	0.5%	(1.6%)
Interactive Media & Services	19.4%	19.4%	18.2%	25.2%	18.1%	(1.2%)
Diversified Telecommunication Services	4.2%	4.4%	2.8%	4.0%	3.3%	(1.0%)
Specialty Retail	5.7%	5.7%	6.8%	19.6%	4.8%	(0.9%)
Software	15.8%	17.2%	18.4%	19.1%	18.9%	3.1%
Machinery	4.3%	5.2%	2.9%	7.6%	8.8%	4.5%
Metals & Mining	3.8%	8.5%	4.1%	18.4%	8.7%	4.9%
Entertainment	8.4%	8.4%	8.5%	10.8%	17.6%	9.2%
Semiconductors & Semiconductor Equipment	7.4%	11.7%	10.2%	23.4%	16.6%	9.2%
Hotels, Restaurants & Leisure	4.6%	3.1%	0.8%	8.8%	20.0%	15.3%
Energy Equipment & Services	0.9%	0.1%	-8.3%	-16.6%	19.3%	18.4%
Oil, Gas & Consumable Fuels	6.9%	11.5%	5.3%	17.3%	27.8%	21.0%
Airlines	2.7%	-2.4%	-7.8%	2.3%	33.7%	31.0%

ESTIMATE ACHIEVABILITY BETTER FOR BIOTECH THAN SOFTWARE

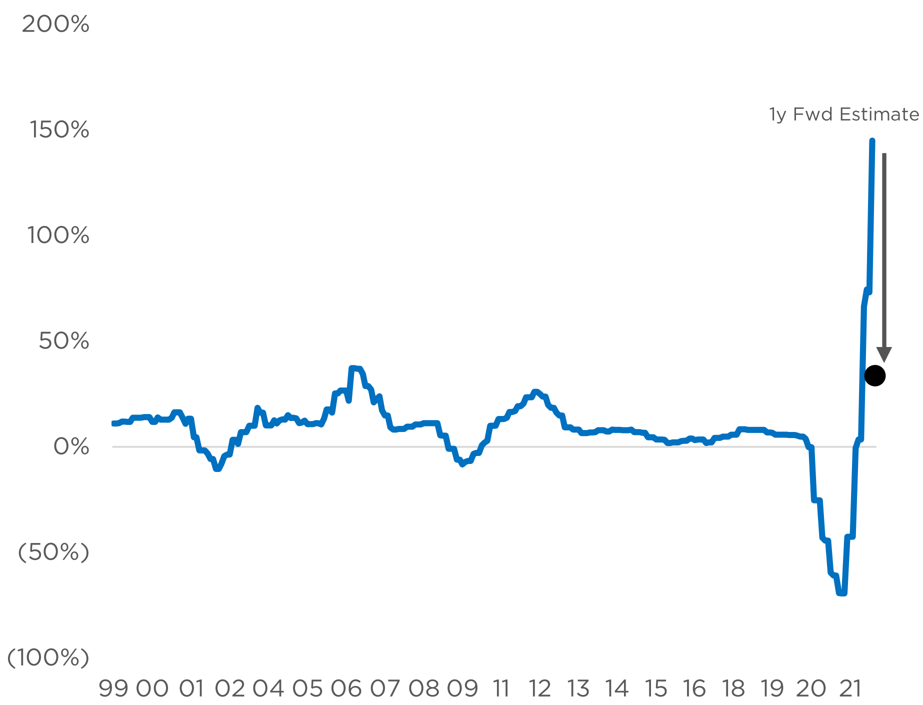
Among the historically fastest growing industries, biotechnology (left) revenue growth expectations for the next 12-month are near the lowest they have been in two decades. On the other hand, software forward expectations are nearly at the trailing 10-year average, though embedding a decline from last year. In our judgment, growth expectations are more achievable for biotech than software.



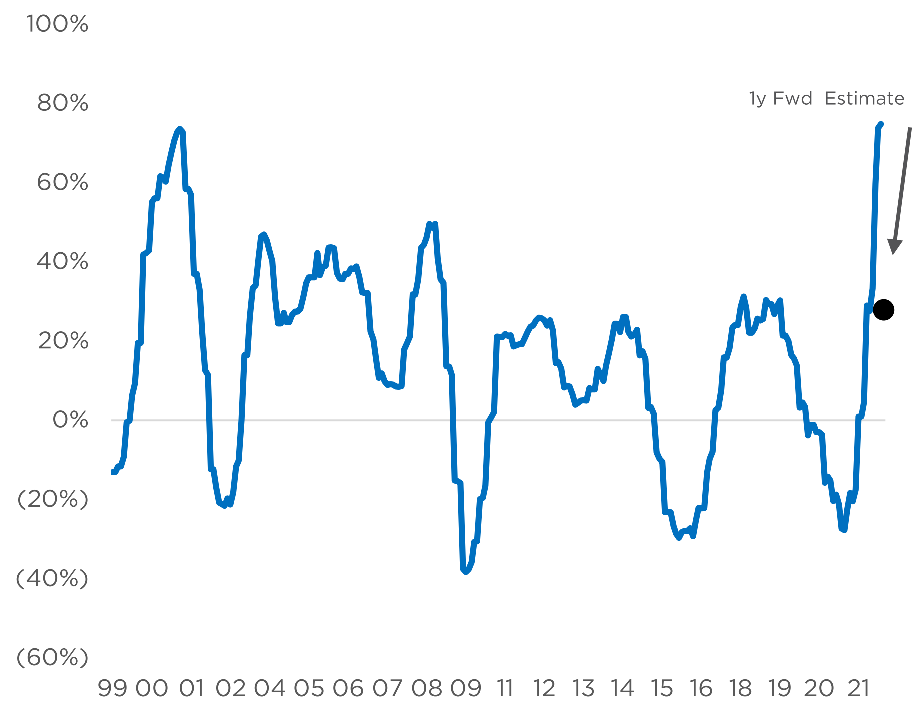
AIRLINES AND OIL AND GAS CONSUMABLES WILL GROW RAPIDLY

Because of material underinvestment in capacity and robust demand, both airlines and energy have experienced very strong revenue growth recently. Airlines expectations are for 33.7% growth over the next 12-months (left), well-above the 10-year average of 2.7%, but down from the cyclical strength achieved after the industry nearly shutdown during COVID. Oil and natural gas prices have skyrocketed and are highly correlated to topline growth for the oil, gas, & consumable fuels sub-industry. Growth expectations are for 21% for the next 12-months, well down from the last year but above long-term trends (right).

Airlines
Year over Year Revenue Growth
Through End-April, 2022



Oil, Gas & Consumable Fuels
Year over Year Revenue Growth
Through End-April, 2022

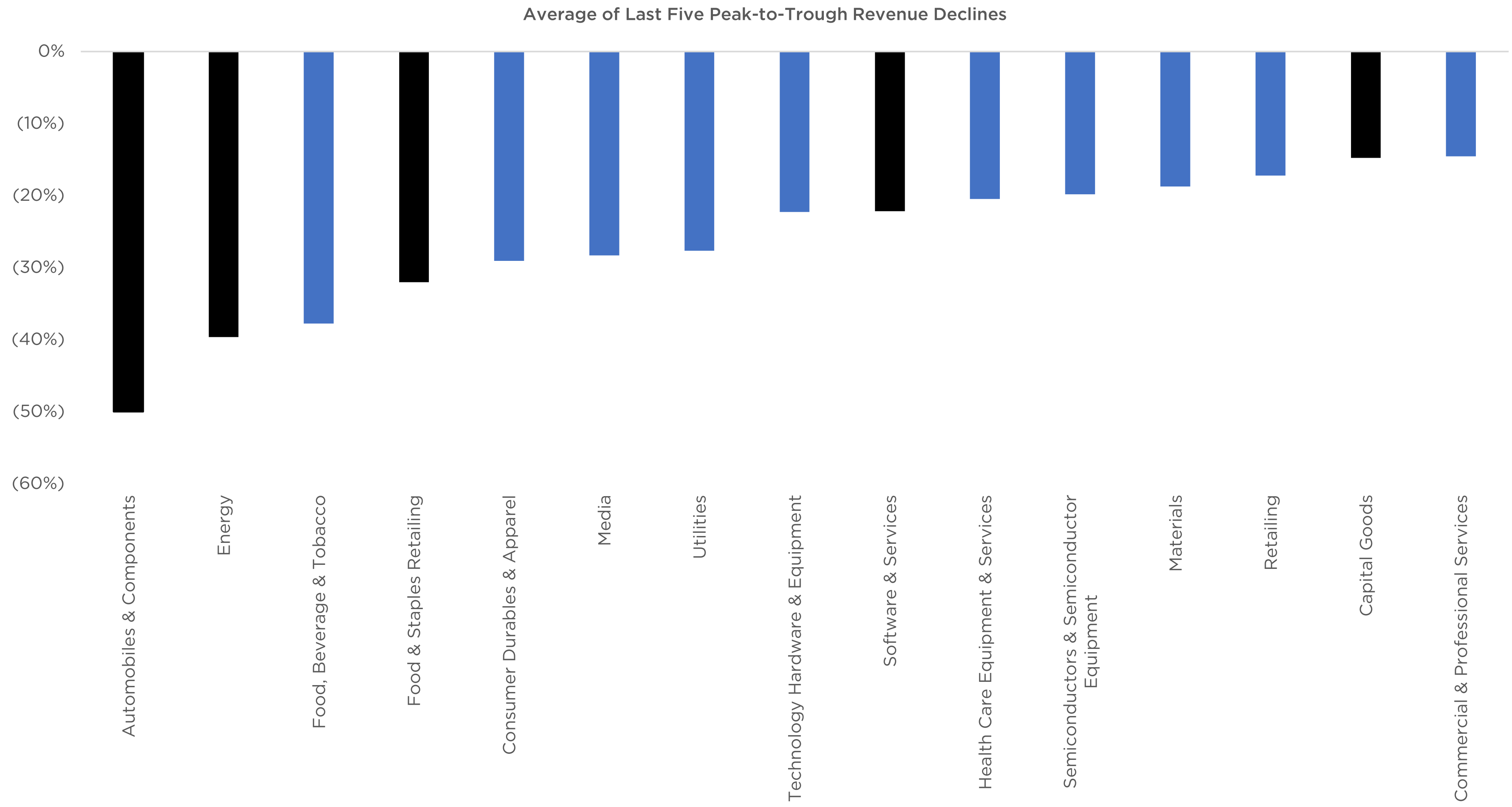


MACHINERY EXPECTATIONS SEEM HIGH, METALS & MINING LOW

We see a disconnect between expectations for machinery (left), which remain relatively high vs. history, and metals & mining where expectations materially decline (right). Our judgment is relative estimate achievability is far better for metals and mining than machinery and we recommend positioning our portfolio that way.

BIG CYCLICAL CRASHES ARE NOT IN THE ESTIMATES

We analyzed the last five peak-to-trough revenue declines for every industry in the last 25 years for context. Autos, energy, and food, beverages & tobacco historically have the biggest declines, while commercial services, capital good and retailing the lowest. We could see autos, capital goods, software, and retailing have revenue pullbacks as severe as the last five biggest declines, but most industries will fare better this cycle.



LARGE REVENUE DECLINES HAVE AMPLE PRECEDENT

The financial crisis crushed autos and energy, while the TMT crisis impacted software. Looking at the largest five peak-to-trough revenue declines in the last 25 years for key industries show us that the software decline so far, as an example, is not unprecedented. We would not be surprised to see autos and capital goods decline materially.

Largest Peak-To-Trough Revenue Drawdowns
Various Industries
Since 1999

	Peak	Trough	Total Revenue Decline
Automobiles & Components	12/31/2008	4/30/2010	(67.5%)
	7/31/2008	10/31/2008	(50.9%)
	3/31/2006	3/30/2007	(47.9%)
	10/30/2015	11/30/2016	(41.8%)
	10/30/2015	12/30/2016	(41.8%)
Capital Goods	10/31/2006	8/31/2010	(24.5%)
	11/30/2015	1/31/2017	(14.8%)
	6/30/2020	3/31/2021	(14.6%)
	3/30/2001	4/30/2002	(12.5%)
	3/31/2000	4/28/2000	(7.4%)
Energy	1/30/2015	7/31/2017	(52.4%)
	2/27/2009	3/31/2010	(39.1%)
	2/27/2009	4/30/2010	(39.1%)
	3/31/2020	3/31/2021	(39.0%)
	12/31/2001	2/28/2003	(28.7%)
Food & Staples Retailing	3/31/2000	2/28/2003	(41.3%)
	8/31/2021	11/30/2021	(32.0%)
	2/27/2009	10/30/2009	(31.9%)
	3/29/2018	5/31/2019	(29.7%)
	7/31/2015	11/30/2015	(25.2%)
Software & Services	8/31/1999	3/31/2000	(42.7%)
	9/30/2002	8/29/2003	(18.1%)
	8/31/2018	4/29/2022	(17.7%)
	8/31/2001	1/31/2002	(17.4%)
	9/28/2007	2/29/2008	(14.9%)

WHAT'S IN THE PRICE IF THERE'S REVENUE GROWTH MEAN-REVERSION

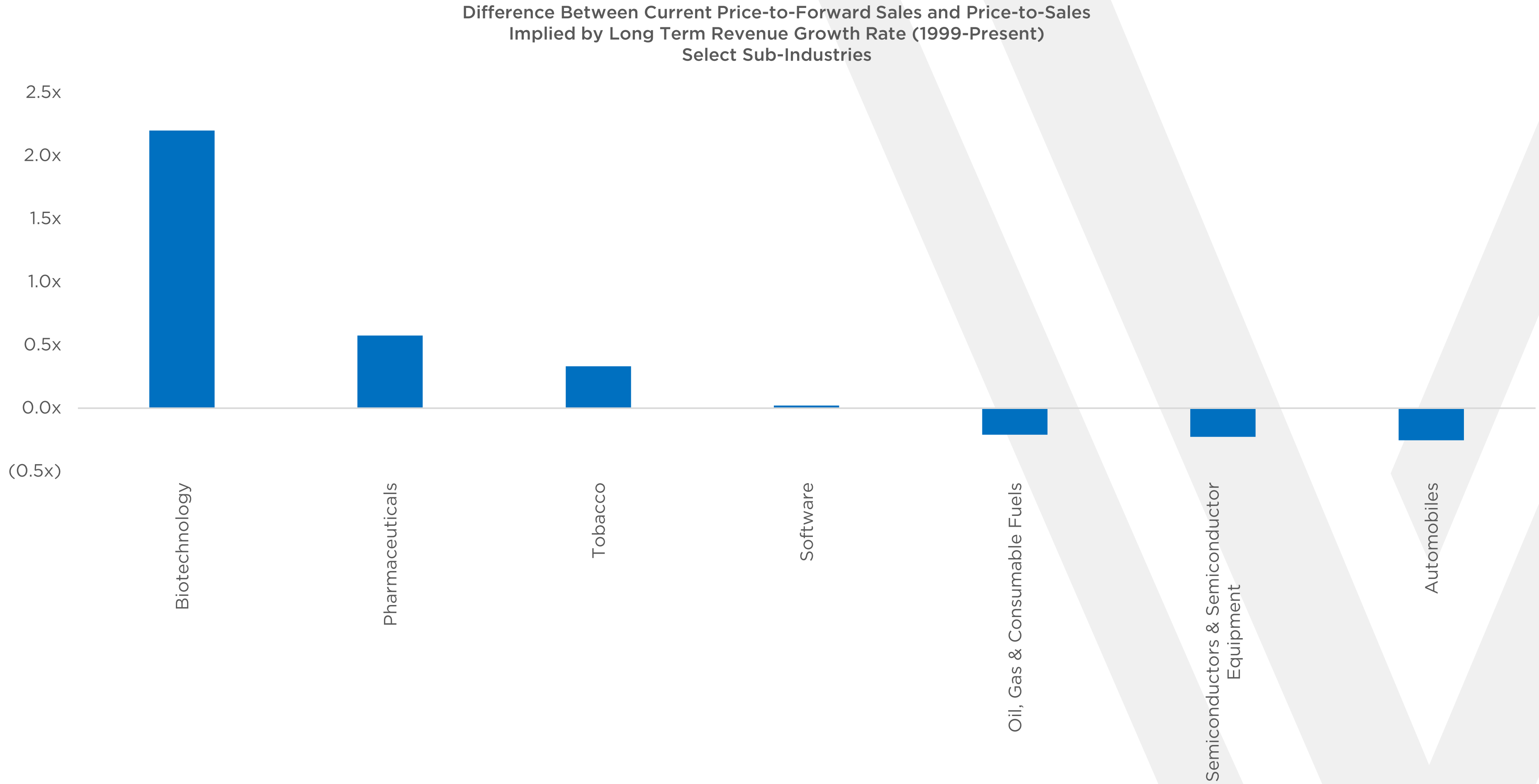
Expectations about the future revenue growth rate and the profitability drive the price-to-sales levels and changes. We compared the long-term price-to-sales and forward price-to-sales to unemotionally evaluate today's valuation levels vs. history for each industry and get an "implied" multiple under the conditions that history's growth rates are more accurate than the current estimates. Biotech and pharma looks cheap, and autos expensive in this scenario. Investors can use any historical time frame they want to gauge the "normal" growth rates by contacting us.

Implied Price-to-Sales Growth Over Various Horizons of Long-Term Revenue Growth
Versus 1y Fwd. Price-to-Sales
Sub-Industries With Largest and Smallest Deltas

Sub-Industry	Long Term Implied (20y) Price-to-Sales	Medium Term Implied (5yr) Price-to-Sales	Forward Price-to-Sales	20y Implied Minus Forward Delta	5y Implied Minus Forward Delta
Biotechnology	15.84x	15.90x	18.03x	(2.20x)	(2.13x)
Pharmaceuticals	6.68x	7.15x	7.25x	(0.57x)	(0.10x)
Tobacco	4.16x	4.12x	4.49x	(0.33x)	(0.37x)
Transportation Infrastructure	1.80x	2.08x	2.06x	(0.26x)	0.02x
Water Utilities	5.59x	5.69x	5.74x	(0.15x)	(0.04x)
Wireless Telecommunication Services	1.10x	1.25x	1.23x	(0.13x)	0.01x
Multi-Utilities	2.45x	2.54x	2.56x	(0.11x)	(0.02x)
Electric Utilities	2.30x	2.35x	2.40x	(0.10x)	(0.05x)
Diversified Telecommunication Services	1.30x	1.33x	1.34x	(0.04x)	(0.02x)
Communications Equipment	1.68x	1.74x	1.72x	(0.04x)	0.02x
Airlines	0.62x	0.68x	0.50x	0.12x	0.18x
Electrical Equipment	2.65x	2.70x	2.51x	0.14x	0.19x
Software	5.61x	5.51x	5.43x	0.18x	0.08x
Life Sciences Tools & Services	5.57x	5.46x	5.39x	0.18x	0.07x
Hotels, Restaurants & Leisure	1.80x	1.87x	1.61x	0.20x	0.26x
Entertainment	2.53x	2.53x	2.33x	0.20x	0.20x
Oil, Gas & Consumable Fuels	2.15x	2.23x	1.94x	0.21x	0.28x
Semiconductors & Semiconductor Equipment	3.98x	3.91x	3.75x	0.23x	0.16x
Construction Materials	2.92x	2.90x	2.66x	0.25x	0.24x
Automobiles	5.32x	5.07x	5.06x	0.26x	0.01x

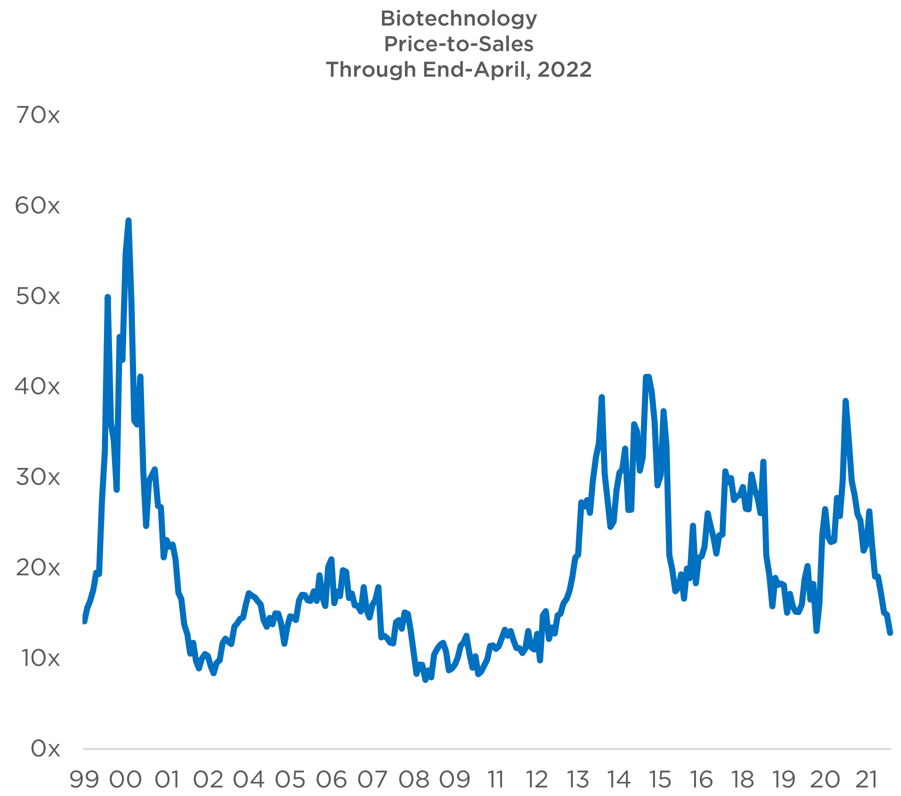
HOW DO YOU ASSESS VALUATION IF GROWTH RATES ARE ALTERED?

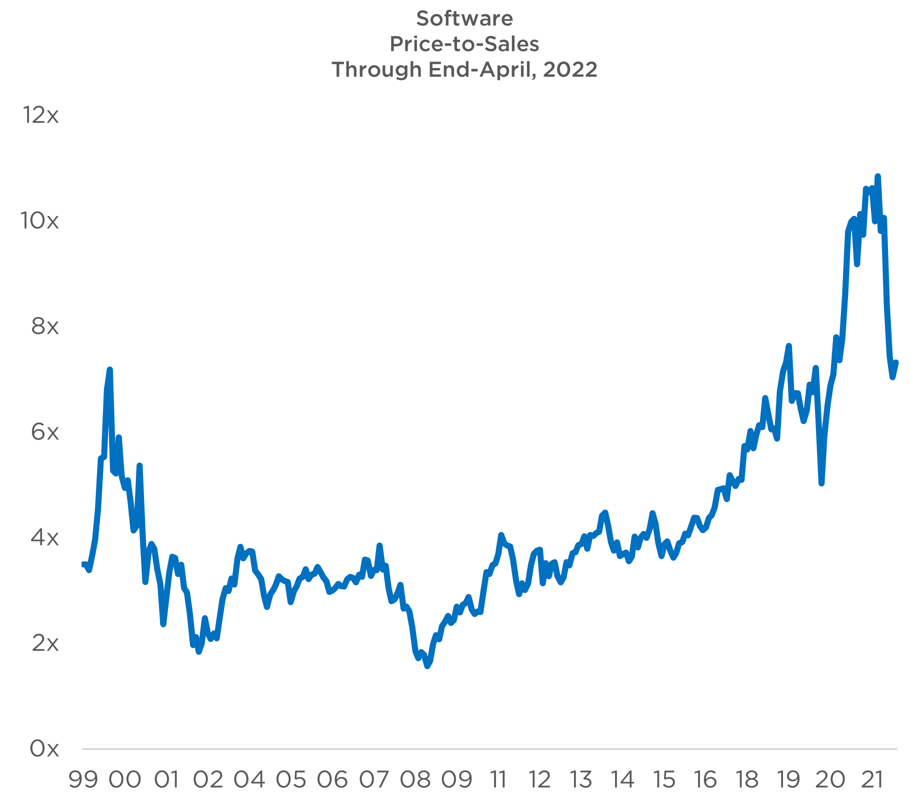
If forecasted long-term revenue growth rates are more accurate than current revenue projections, biotech and pharma are cheap, and autos, semis, and energy are expensive. While we do not think relying on long-term history is always relevant, we do think history is more relevant when the current outlook is this uncertain. Our judgment is biotechnology is likely going to grow faster than expectations, and that the 12-month forward view is not as relevant of this group as others. Pharma and tobacco likely grow more slowly than history. Energy will grow more rapidly. We expect that autos and software growth will disappoint.



BIOTECH SEEMS FAR CHEAPER THAN SOFTWARE

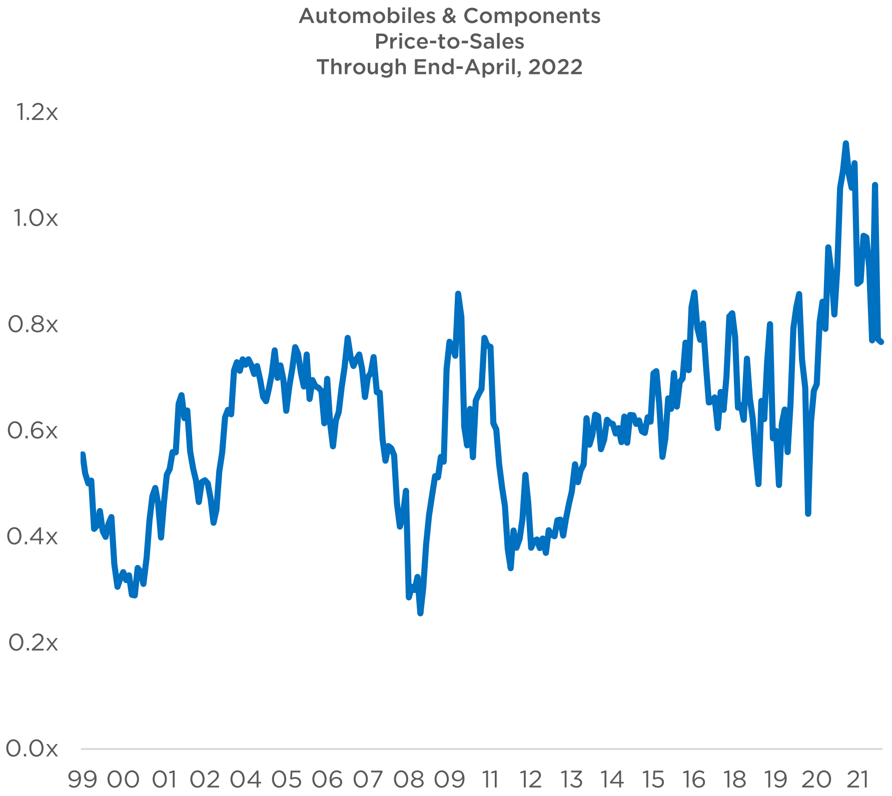
While biotechnology stocks are always about safety and efficacy of their potential pipeline and long-term growth, more than the current sales, the median stock's price to sales has still fallen to trough levels (left). On the other hand, software valuations are still materially above longer-term trends (right). Given so many software business were selling products to each other, and trends have slowed, we wouldn't be surprised to see more relative valuation compression from here for software, particularly because so many of the companies still do not make money even with reasonably high current revenue.

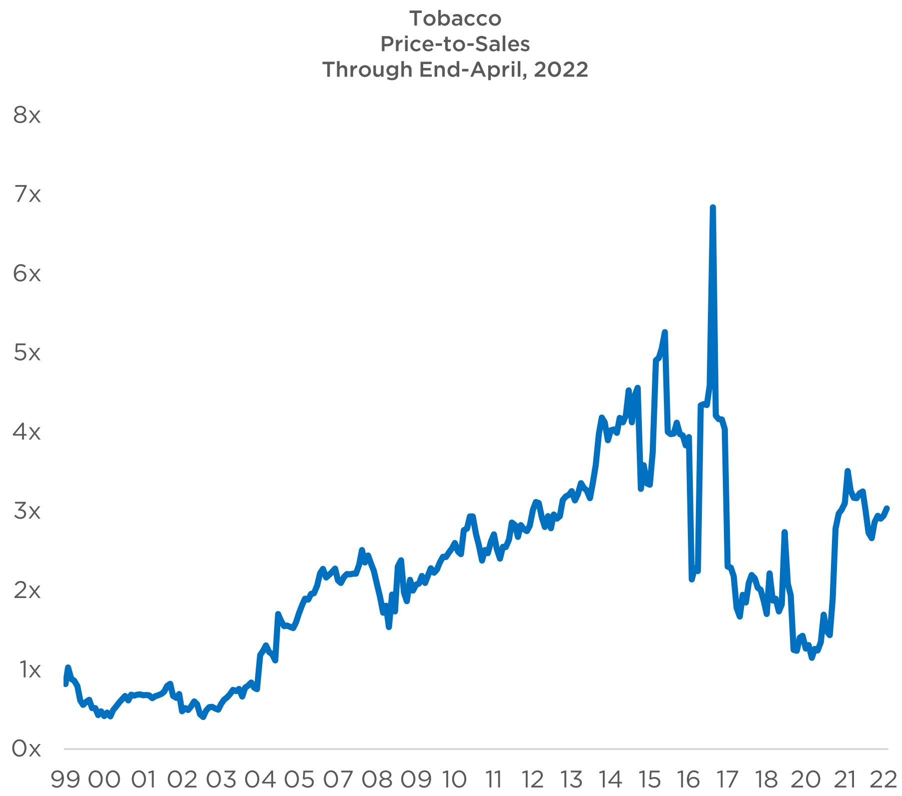




AUTOS AND TOBACCO: PRECEDENT FOR MULTIPLE COMPRESSION

Autos trade at roughly 1x sales, as capacity constraints drove better-than-normal economics in the recent quarters. We suspect revenue growth will decline and multiple still have ample room to retreat (left) vs. history. Tobacco growth rates have certainly slower, and valuation compression also has some historical precedent (right).





QUANTITATIVELY-DERIVED LONG AND SHORT IDEAS

Buy and sell ideas that embody today's work are shown below. For the complete analysis please email us.

Quantitatively Derived Long/Short Ideas
Based on Sub-Industry-Relative Price-to-Sales, Gross Margins, Revenue Growth Forecasts, and Other Overlays
As-Of April 25, 2022

Longs

Ticker	Company Name	Sub-Industry	Market Cap ($ US. Bil)
OXY	Occidental Petroleum Corporation	Oil, Gas & Consumable Fuels	62.22
AEM	Agnico Eagle Mines Limited	Metals & Mining	24.93
LEN	Lennar Corporation	Household Durables	21.93
MOS	The Mosaic Company	Chemicals	21.65
NTAP	NetApp, Inc.	Tech Hardware & Storage	15.45
FWONK	Formula One Group	Entertainment	14.27
CLF	Cleveland-Cliffs Inc.	Metals & Mining	11.90
PHM	PulteGroup, Inc.	Household Durables	10.21
ARMK	Aramark	Hotels, Restaurants & Leisure	8.41
ITCI	Intra-Cellular Therapies, Inc.	Pharmaceuticals	5.35
HGV	Hilton Grand Vacations Inc.	Hotels, Restaurants & Leisure	5.10

Shorts

Ticker	Company Name	Sub-Industry	Market Cap ($ US. Bil)
PEP	PepsiCo, Inc.	Beverages	233.63
INTU	Intuit Inc.	Software	109.57
MDLZ	Mondelez International, Inc.	Food Products	86.32
EL	The Estée Lauder Companies Inc.	Personal Products	82.94
ISRG	Intuitive Surgical, Inc.	Health Care Equip & Supplies	79.90
TGT	Target Corporation	Multiline Retail	72.53
NEM	Newmont Corporation	Metals & Mining	55.19
KMB	Kimberly-Clark Corporation	Household Products	44.26
GIS	General Mills, Inc.	Food Products	41.71
GPN	Global Payments Inc.	IT Services	35.33
DLTR	Dollar Tree, Inc.	Multiline Retail	30.13
ROST	Ross Stores, Inc.	Specialty Retail	28.59
HRL	Hormel Foods Corporation	Food Products	26.68
DOV	Dover Corporation	Machinery	18.71
AKAM	Akamai Technologies, Inc.	IT Services	15.89
HAS	Hasbro, Inc.	Leisure Products	11.65
GGG	Graco Inc.	Machinery	10.37

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