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Economic Beta: An Alternative Means of Analyzing Risk

The pronounced sensitivity to risk in today's world has led to share price reactions across many equity asset classes globally. Risk can be measured in many ways, yet the notion of "Beta" is one of the more conventional concepts, linking the relationship between two variables. In finance parlance, we often link the movement of a stock (or active portfolio) (dependent variable) with that of the market (independent variable). Alternatively, we can measure risk in terms of how a company's financial performance (dependent variable) relates to changes in the economy (independent variable), creating what can be coined as an "Economic Beta." This analysis can be useful in conjunction with analyzing share price reactions to changes in the market, given that achieving economic balance in a portfolio requires an understanding of the economic sensitivity of the components of an active portfolio. Components of an active portfolio (or market) can typically be categorized at a sector level.

To study this concept, we gathered annual EBITDA for each company in our current equity screens[1] going back to 1999. In an effort to maintain consistency from year-to-year, we only kept companies that had data populated every year of the history. We calculated annual growth rates for each constituent, by sector, and then took a median of these growth rates to determine the "Sector EBITDA Growth" for each year.

For our GDP data, we went to the Federal Reserve Economic Data website (https://fred.stlouisfed.org) and grabbed GDP growth information (Billions of Dollars, Annual, Seasonally Adjusted Annual Rate). With two streams of growth rates, the calculation of what we are calling the Economic Beta becomes fairly straightforward. The beta calculation for each sector is:

$$\frac{\text{Covariance (Sector EBITDA Growth, GDP Growth)}}{\text{Variance (GDP Growth)}}$$

The resulting data can be seen in the table below.

Sector	**Beta** [Median Sector EBITDA Growth vs. GDP Growth]
Telecommunications	-0.06
Consumer Staples	0.10
Utilities	0.14
Health Care	0.63
Chemicals	1.21
Retail	1.36
Services	1.43
Building	1.82
Capital Goods	1.85
Technology	1.92
Transportation	2.83
Consumer Durables	4.01
Metals	5.04
Semiconductors	5.25
Energy	7.67

[1] US listed common stocks with >$100m market cap. Excludes Banks, Financials, REITs, and Insurance. Excludes ADRs, MLPs, and Trusts/Royalty Trusts. Source: FRED, FactSet Research Systems

At first glance, the rank order of the sectors is in line with expectations. Our first takeaway is that all but four sectors have an Economic Beta greater than 1.0. Companies see more variability in EBITDA than our country sees in its annual GDP. The four sectors that fall below 1.0 – Telecommunications, Utilities, Consumer Staples, and Health Care – are probably no surprise to anyone. Building and Capital Goods/Industrial stand out as lower than we might have thought, and it is interesting to note that with all of the attention that the Technology sector gets (and its ever-growing weight in the Index), it falls in the middle of the rankings just slightly above the median sector Economic Beta. That said, the Semiconductors sector, which for our purposes includes mega-cap stocks like NVIDIA Corporation (NVDA) and Broadcom Inc. (AVGO), does come in with a high calculated Economic Beta. At the high end of the list the Energy sector beta was a bit of a surprise, likely driven by the combination of lower activity and lower commodity prices when the economy is challenged (and vice versa). And while the beta values are meaningfully higher than we see with traditional stock betas, this does make some sense.

Conclusion

The disaggregation of economic sensitivity by sector reveals some consistency with how one might view stock price sensitivity. That is, the historically "low" sectors using a traditional measure of stock beta line up with economic sensitivity when EBITDA growth and GDP are related to one another. However, there are perhaps different ways to view cyclicality in sectors outside this "stable" group, as called out above. How could we use this data?

1. Explore modifying cyclicality definitions in the interest of keeping balanced exposure between Low Cyclicality, Moderate Cyclicality and High Cyclicality in portfolios, in keeping with our process as a bottom-up manager striving to generate long term risk-adjusted excess return primarily via stock selection.

2. Maintain more conservatism in DCF-driven valuation models of companies in higher cyclicality (by Economic Beta) sectors.

3. Demand a higher credit profile (lower debt ratio, higher fixed charge and liquidity coverages) for sourcing/retaining higher cyclicality companies in higher cyclicality (by Economic Beta) sectors, as weak economic conditions stress the financial condition of these firms. Relex this requirement for those in lower cyclicality sectors, as they have a greater ability to withstand weak economic conditions.

We come away from this analysis with an augmented perspective on how to use beta in structuring portfolios and building valuation models, which provides an alternative means of judging sensitivity, separate and apart from individual stock price movements in relationship to that of the overall market.