Empirical Research Partners

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Portfolio Strategy October 2022

Leveraged Serial Acquirers

Playing Defense with Defense

The End of the Road for Debt-Financed Serial Acquirers?

- We've pointed out before that the composition of the debt borne by publicly-listed companies is benign, even in the face of sharply higher interest rates. Three-quarters of the outstanding borrowing is at fixed-rates and matures in 2024 or beyond. More than 40% of the entire debt burden matures after 2029. That means the dollar-weighted interest rate of 3.5% that large-cap companies are currently paying will only rise glacially over the next decade, even if interest rates keep going up.
- Therefore, the immediate impact of higher rates is mostly limited to marginal activities that require raising new debt. One pocket of potential concern is a group of companies we call Leveraged Serial Acquirers: firms that have done lots of deals over the past five years, where the cumulative value of those deals is large relative to their market cap, and where they've raised a lot of new debt to fund their acquisition spree. In the decade before the Pandemic these prolific acquirers did a good job of parlaying steadily-declining funding costs into above-market top-line growth rates. What happens now that the music has stopped?
- The Leveraged Serial Acquirers aren't terrible companies fundamentally. In fact, as a group they have superior free cash flow margins compared to the market at large. Even though their debt burdens are (by definition) high, they're at little immediate risk of insolvency: the average Leveraged Serial Acquirer has at EBIT interest coverage ratio of almost seven times and the structure of their debt is just like the broader market, they've financed themselves long at rock-bottom rates. The stocks are also underrepresented on our Failure Model.
- Moreover, the stocks are trading at the lowest relative forward multiples and the highest relative free cash flow yields that we've seen. Investors aren't worried about their existing debt, they're worried that their growth rates will suffer now that they can't bolt on new acquisitions financed by cheap debt. That's a real risk, but in world where we expect free cash flow production to matter more than top-line growth it's possible that fear is being overblown in some cases. Appendix 1 on page 10 screens the Leveraged Serial Acquirers through our Growth Model framework, looking for GARP-y ideas with ample free cash flows and favorable valuations that offer some cover for a slowdown in leveraged growth.

Defense Stocks: Anything Left in the Arsenal?

- Clients have asked us whether there's any upside left in the defense stocks. That's a good question because the stocks have erased a (30)% forward-P/E discount to the market this year and now trade at about parity, a high relative valuation by historical standards. In the past, the stocks' multiples have loosely tracked five-year-ahead growth in defense spending and the current valuations look high relative to future spending forecasts.
- On the other hand, the stocks do offer high Fundamental Stability, an all-round measure of the consistency and predictability of a firm's earnings growth, its return on capital, and its leverage and beta. The defense stocks are trading at a forward-P/E discount to other Fundamentally-Stable businesses. That makes them a lower-priced alterative to some of the other classic defensive plays in the market, like the staples and utilities that are trading at +10-to-15% P/E premiums to the market.
- Appendix 2 on page 10 ranks the defense issues on valuation and capital deployment metrics that have historically been efficacious in the space. The price of entry is too high for a full-throated endorsement, but there are a few stock-level ideas that are worth considering as alternatives to the richly-valued classic defensives.

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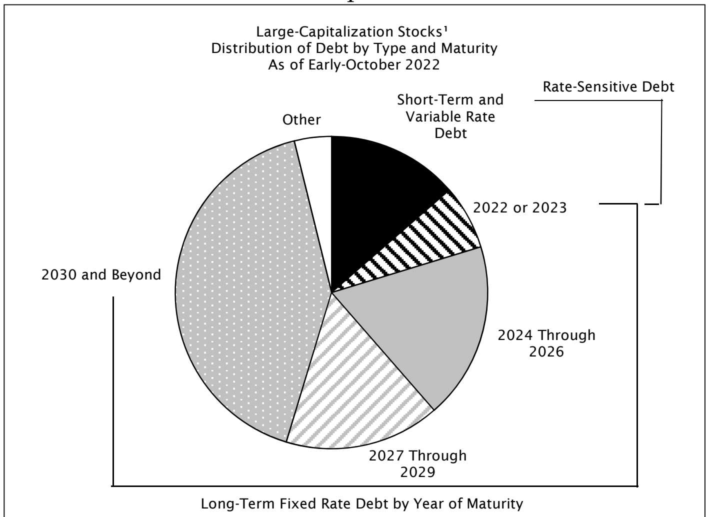
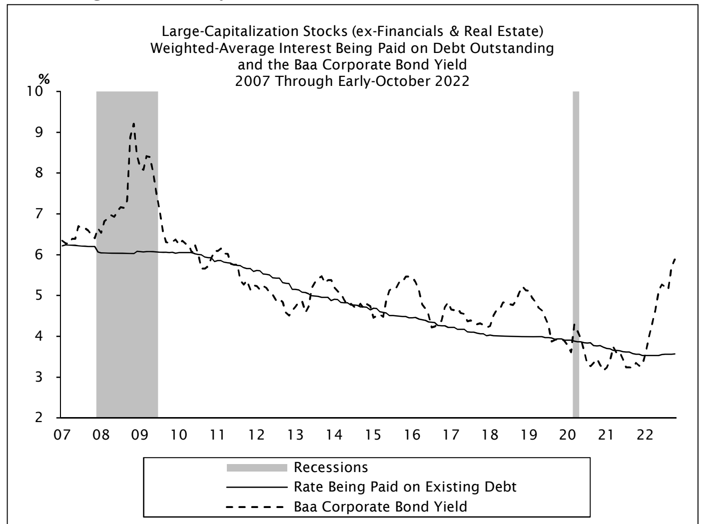
Conclusions in Brief

- For listed companies most of the debt is fixed-rate and won't mature for the better part of a decade….



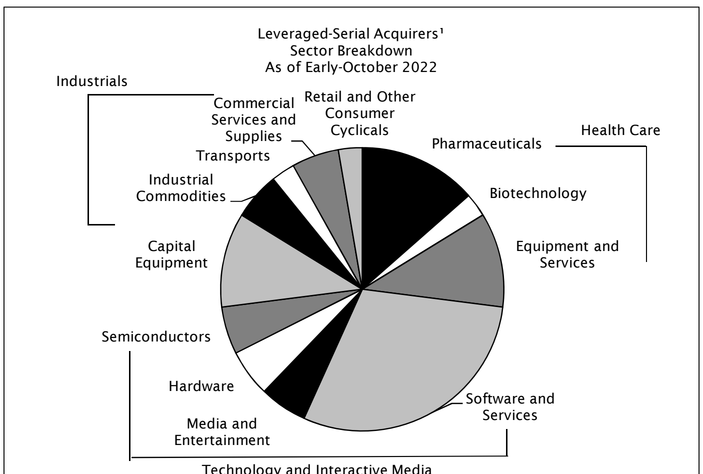
Source: Empirical Research Partners Analysis.
¹ Excludes financials and REITs.

- …So the impact of sharply higher rates is mostly on marginal activity:



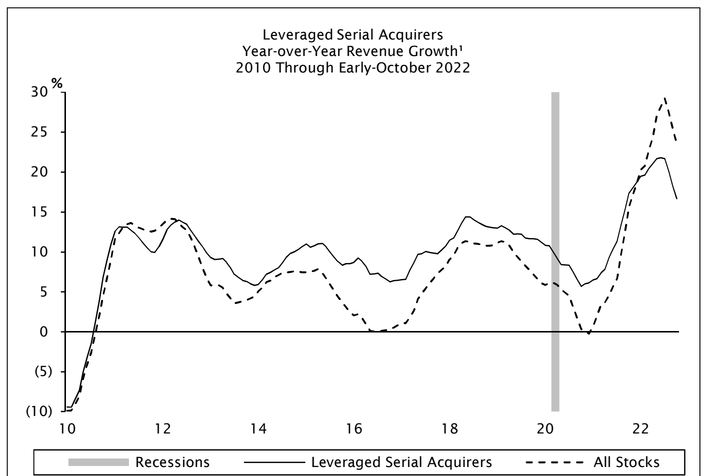
Source: FactSet Research Systems, Moody's, Empirical Research Partners Analysis.

- One place the impact will be felt is in Leveraged Serial Acquirers…



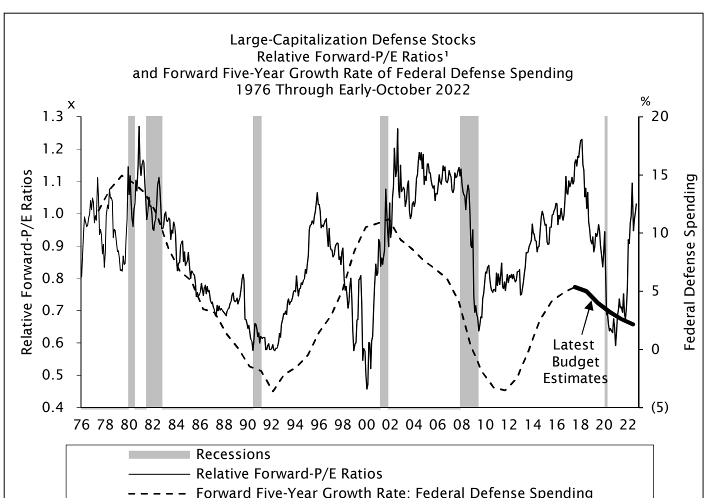
Source: Empirical Research Partners Analysis.
¹ Stocks simultaneously in the highest two quintiles of (1) number of acquisitions in past five years; (2) cumulative value of those acquisitions relative to market cap; and (3) cumulative value of debt raised relative to total assets over past five years.

- …That have relied on debt-financed acquisitions to grow at above-market rates:



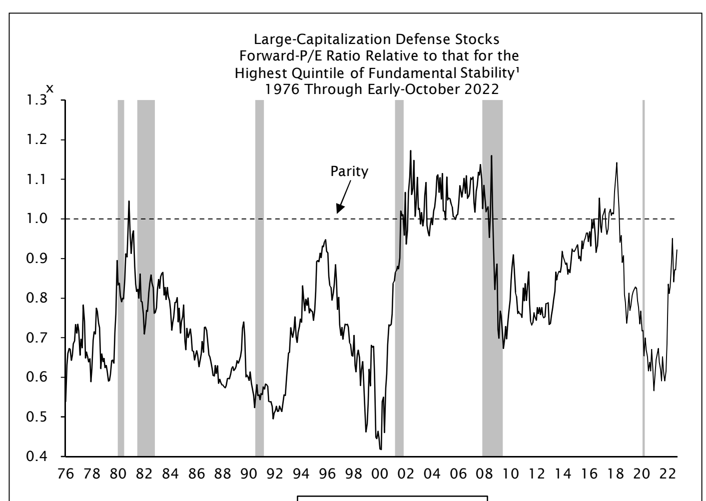
Source: Empirical Research Partners Analysis.
¹ Equally-weighted data. Most recent four quarters compared to the four quarters before that. Data smoothed on a trailing three-month basis.

- Defense stocks have been revalued...



Source: White House Office of Management and Budget, Corporate Reports, Empirical Research Partners Analysis.
¹ Capitalization-weighted data.

- …But trade at a discount to other fundamentally-stable stocks:



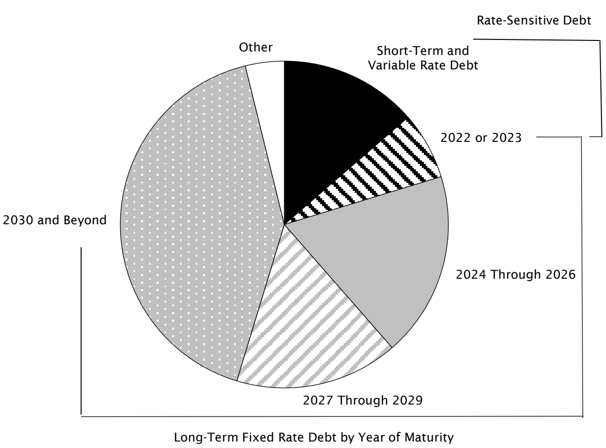
Source: Empirical Research Partners Analysis.
¹ Capitalization-weighted data.

Leveraged Serial Acquirers

The End of the Road?

One of the worries we often hear from clients is that too many companies have gorged themselves on cheap debt over the last decade and will surely find themselves in a world of pain now that interest rates have reset. However, as we've pointed out before, the immediate impact of higher rates on borrowing costs for publicly-listed companies is quite limited because three-quarters of their outstanding debt is at fixed-rates and doesn't mature until 2024 or later (see Exhibit 1). More than 40% of the debt burden matures in 2030 or beyond.

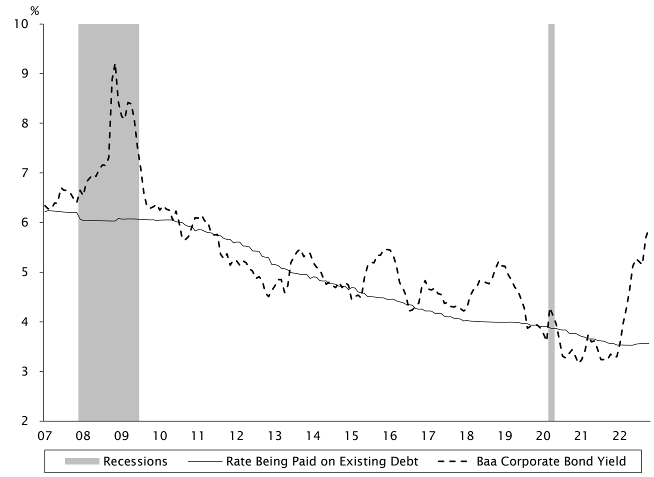
**Exhibit 1: Large-Capitalization Stocks[1]
Distribution of Debt by Type and Maturity
As of Early-October 2022**



Source: Empirical Research Partners Analysis.

[1] Excludes financials and REITs.

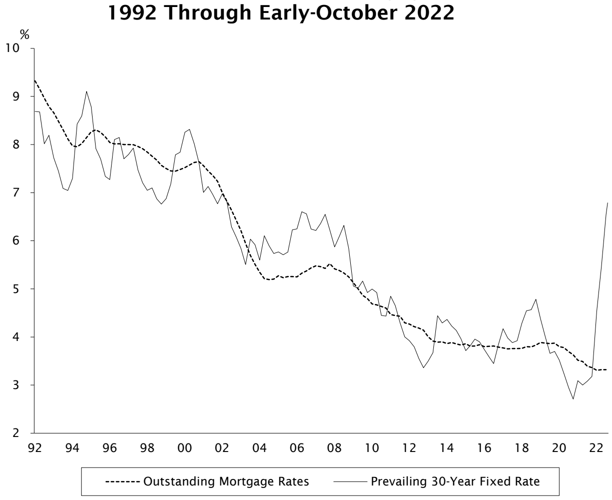
**Exhibit 2: Large-Cap Stocks (ex-Financials & Real Estate)
Weighted-Average Interest Being Paid on Debt
Outstanding and the Baa Corporate Bond Yield
2007 Through Early-October 2022**



Source: FactSet Research Systems, Moody's, Empirical Research Partners Analysis.

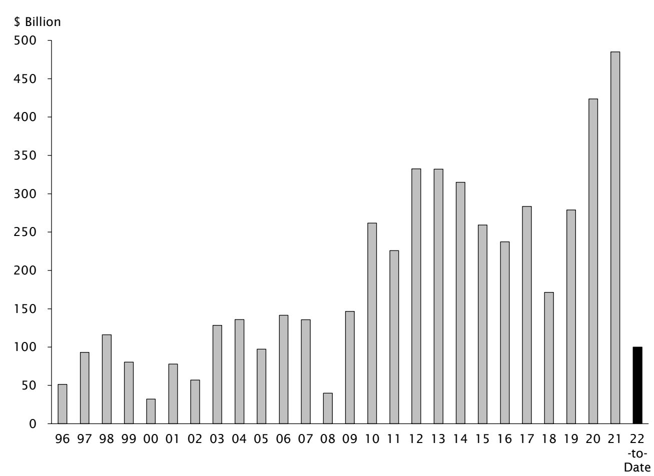
That means the 3.5% dollar-weighted interest rate that large-cap companies are paying will only move up glacially over the next decade, even though the spot rate has skyrocketed (see Exhibit 2). In that sense the companies are a lot like American homeowners, who have also locked in record-low mortgage rates (see Exhibit 3). In both cases, the impact of higher rates is only felt on *marginal* activity: the homeowner who has to move or the company whose business model relies on continually raising new debt.

**Exhibit 3: Average Rate on Outstanding Mortgages
and the 30-Year Fixed Mortgage Rate
1992 Through Early-October 2022**



Source: Bureau of Economic Analysis, Federal Reserve Bank of St. Louis, Empirical Research Partners Analysis.

**Exhibit 4: U.S. High Yield Corporate Bond Issuance[1]
1996 Through Q3 2022**



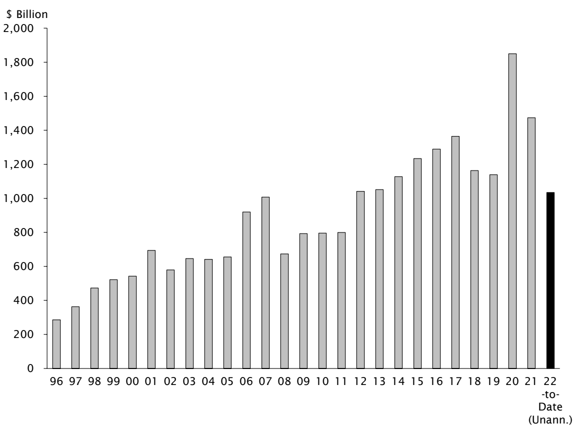
Source: SIFMA, Empirical Research Partners Analysis.

[1] Includes all corporate debt, MTNs and Yankee bonds, but excludes all issues with maturities of one year or less and CDs.

In the case of companies, there's already some evidence that marginal activity is drying up. High yield issuance this year is about a fifth of last year's total, with only a quarter to go (see Exhibit 4 overleaf). On the other hand, investment grade debt issuance is hanging in there, but almost half of the year-to-date total was raised in the first quarter (see Exhibit 5).

One part of the market where the marginal cost of borrowing does matter is in a bunch of companies that we'll call Leveraged Serial Acquirers. They're a cohort of about 40 companies that rank in the highest two quintiles of (1) the number of acquisitions executed over the past five years, (2) the cumulative value of those acquisitions relative to market cap, and (3) the cumulative value of debt raised relative to total assets over the past five years. The idea is to capture companies that have leaned heavily on debt-fueled dealmaking in recent years. The sector mix of the Leveraged Serial Acquirers is shown in Exhibit 6. Most of the issues are drawn from the tech and health care sectors.

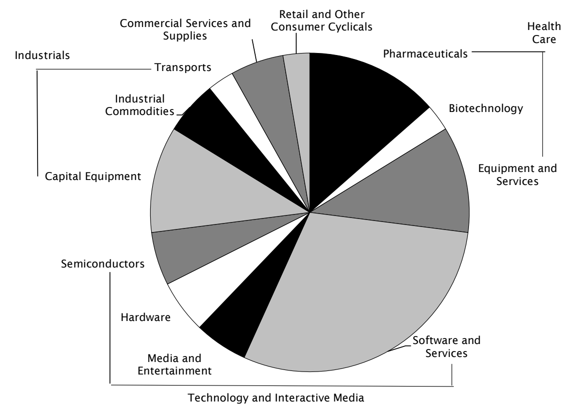
Exhibit 5: U.S. Investment Grade Corporate Bond Issuance[1]
1996 Through Q3 2022



Source: SIFMA, Empirical Research Partners Analysis.

[1] Includes all corporate debt, MTNs and Yankee bonds, but excludes all issues with maturities of one year or less and CDs.

Exhibit 6: Leveraged Serial Acquirers[1]
Sector Breakdown
Early-October 2022

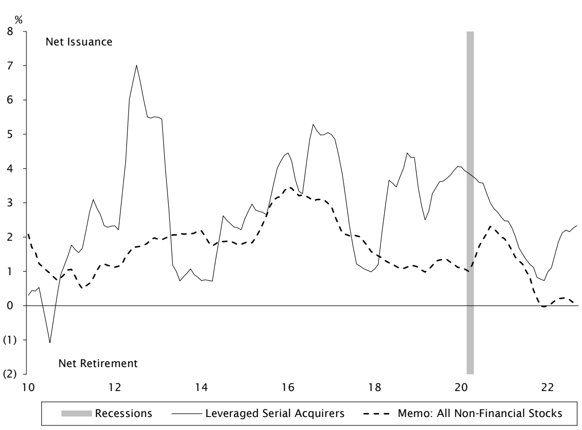


Source: Empirical Research Partners Analysis.

[1] Stocks simultaneously in the highest two quintiles of (1) number of acquisitions in past five years; (2) cumulative value of those acquisitions relative to market cap; and (3) cumulative value of debt raised relative to total assets over past five years.

The Leveraged Serial Acquirers have consistently issued more debt (relative to their size) than the market at large, issuing debt worth about 3% of their cap per year on average since 2010 (see Exhibit 7). Currently their share of total market-wide debt issuance is about 8%, even though they only account for 4% of the market's capitalization (see Exhibit 8). Unsurprisingly, the Leveraged Serial Acquirers have net debt-to-asset ratios that are above that of their peers in the broader market (see Exhibit 9).

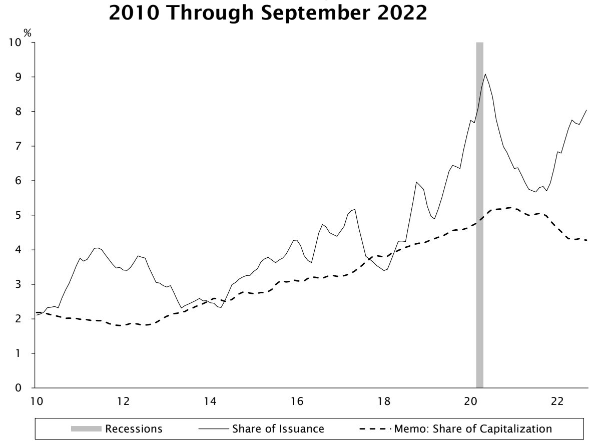
Exhibit 7: Leveraged Serial Acquirers
Net Long-Term Debt Issued-to-Capitalization[1]
2010 Through September 2022



Source: Empirical Research Partners Analysis.

[1] Long-term debt issued over the prior four quarters less long-term debt retired, divided by capitalization. Data smoothed on a trailing three-month basis.

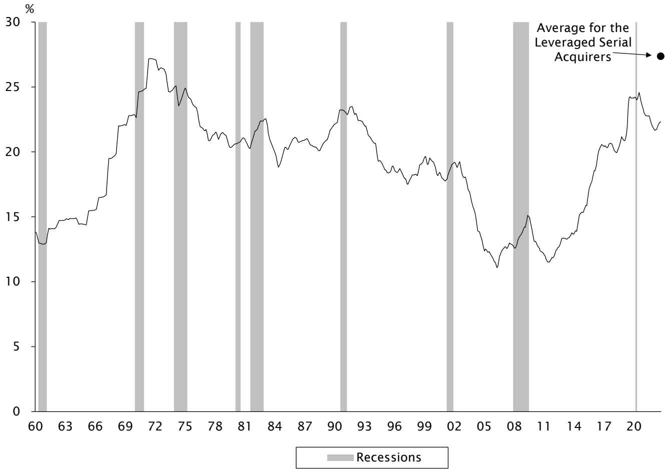
Exhibit 8: Leveraged Serial Acquirers
Net Long-Term Debt Issued as a Share of that for
All Non-Financial Large-Cap Stocks[1]
2010 Through September 2022



Source: Empirical Research Partners Analysis.

[1] Long-term debt issued over the prior four quarters less long-term debt retired. Data smoothed on a trailing three-month basis.
month basis.

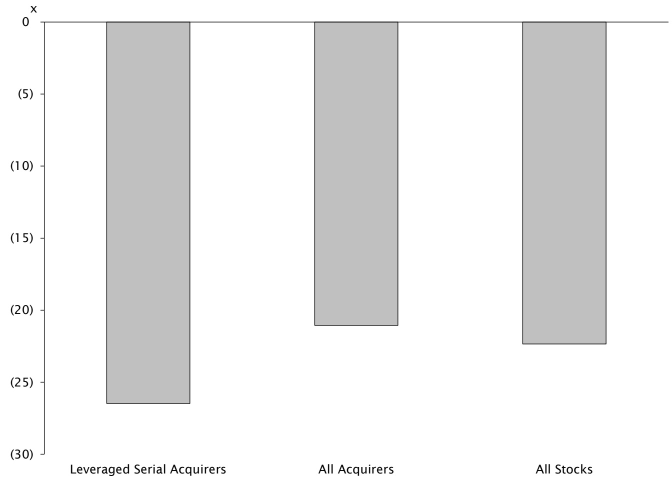
Exhibit 9: Large-Cap Stocks (ex-Financials & Real Estate)
Net Debt-to-Assets Ratio[1]
1960 Through September 2022



Source: Empirical Research Partners Analysis.

[1] Aggregate data smoothed on a trailing three-month basis.

Exhibit 10: Large-Cap Stocks (ex-Financials & Real Estate)
Nominal Returns[1]
2022 Through Early-October



Source: Empirical Research Partners Analysis.

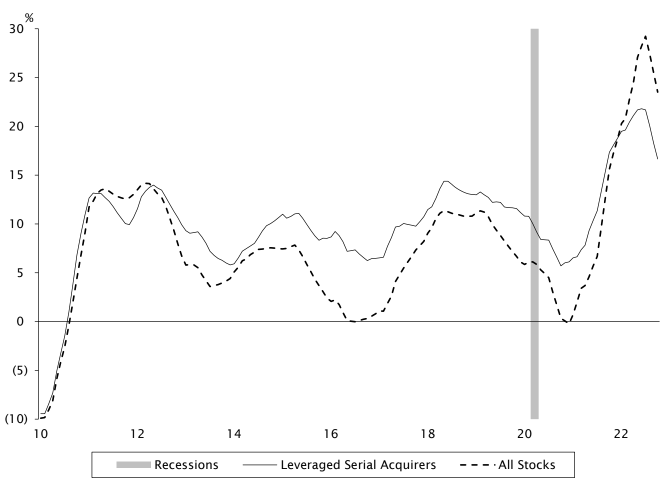
[1] Equally-weighted data. Leveraged serial acquirers are stocks simultaneously in the highest two quintiles of (1) number of acquisitions in past five years; (2) cumulative value of those acquisitions relative to market cap; and (3) cumulative value of debt raised relative to total assets over past five years. All acquirers are stocks that have done at least one acquisition in the past five years.

Cracks Appearing

The Leveraged Serial Acquirers have lagged the market by a bit this year (see Exhibit 10). On an equally-weighted basis they're down (26)% compared to (22)% for the average large-cap stock. A broader list of *all* acquirers (i.e., including those that haven't used much debt or have only done a few deals) has delivered market-like performance, so investors do perhaps have some concerns about the ongoing viability of their debt-driven acquisition model.

For most of the last decade the Leveraged Serial Acquirers have grown their revenues faster than the rest of the market on average, but that's faltered recently (see Exhibit 11). Nonetheless, analysts still project that they'll be able to reclaim their edge over the next couple of years (see Exhibit 12). The market doesn't really share that optimism and the stocks are now trading at the lowest relative forward multiples that we've seen (see Exhibit 13). They're also priced to the highest relative free cash flow yield in history (see Exhibit 14).

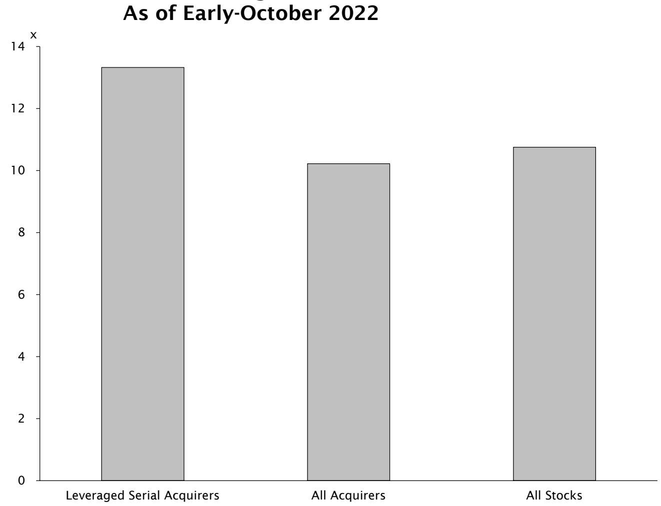
Exhibit 11: Leveraged Serial Acquirers
Year-over-Year Revenue Growth[1]
2010 Through Early-October 2022



Source: Empirical Research Partners Analysis.

[1] Equally-weighted data. Most recent four quarters compared to the four quarters before that. Data smoothed on a trailing three-month basis.

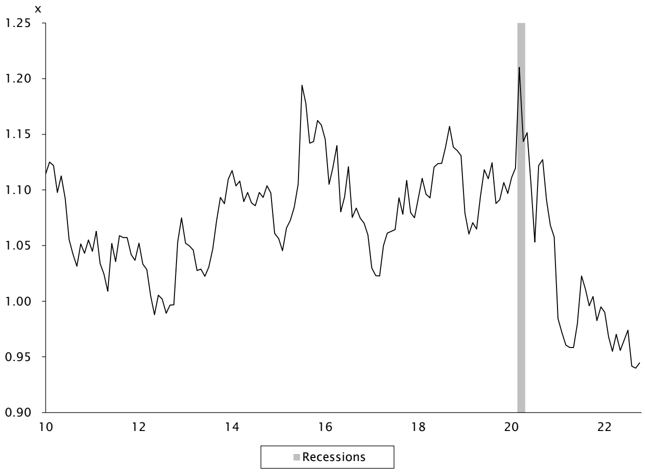
Exhibit 12: Large-Cap Stocks (ex-Financials & Real Estate)
Annualized EPS Growth Expectations:
2022E Through 2024E[1]
As of Early-October 2022



Source: Empirical Research Partners Analysis.

[1] Medians. Leveraged serial acquirers are stocks simultaneously in the highest two quintiles of (1) number of acquisitions in past five years; (2) cumulative value of those acquisitions relative to market cap; and (3) cumulative value of debt raised relative to total assets over past five years. All acquirers are stocks that have done at least one acquisition in the past five years.

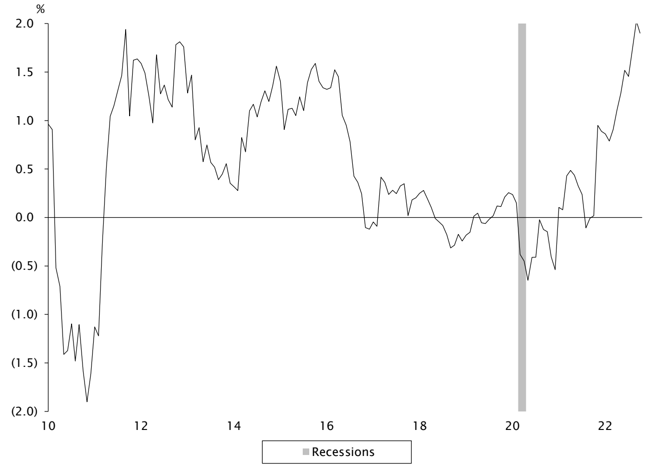
Exhibit 13: Leveraged Serial Acquirers
Relative Forward-P/E Ratio[1]
2010 Through Early-October 2022



Source: Empirical Research Partners Analysis.

[1] Equally-weighted data.

Exhibit 14: Leveraged Serial Acquirers
Relative Free Cash Flow Yield[1]
2010 Through Early-October 2022

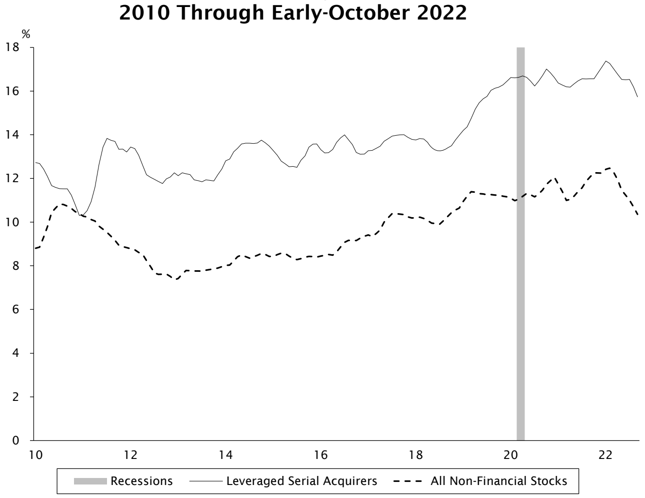


Source: Empirical Research Partners Analysis.

[1] Equally-weighted data.

On that note, it's worth pointing out that the Leveraged Serial Acquirers do in fact have higher free cash flow margins than the broader market (see Exhibit 15). Their debt-driven acquisitions over the past five years have largely been successful and they parlayed cheap capital into robust free cash flow production and, until recently, superior top-line growth.

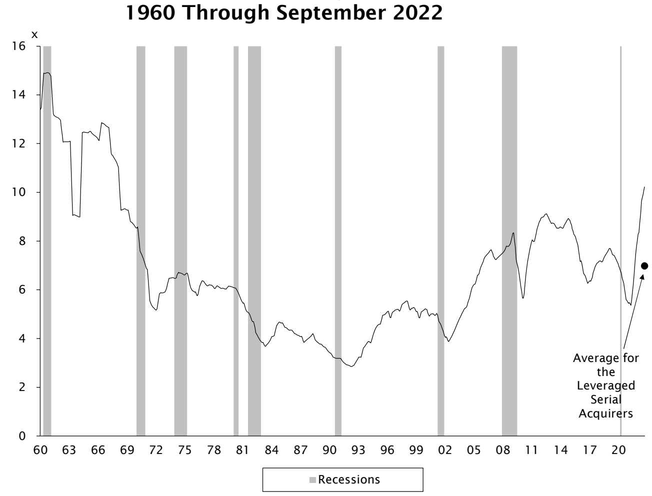
Exhibit 15: Leveraged Serial Acquirers
Free Cash Flow Margins[1]
2010 Through Early-October 2022



Source: Empirical Research Partners Analysis.

[1] Equally-weighted data. Most recent four quarters compared to the four quarters before that. Data smoothed on a trailing three-month basis.

Exhibit 16: Large-Cap Stocks (ex-Financials & Real Estate)
EBIT Interest Coverage Ratio[1]
1960 Through September 2022



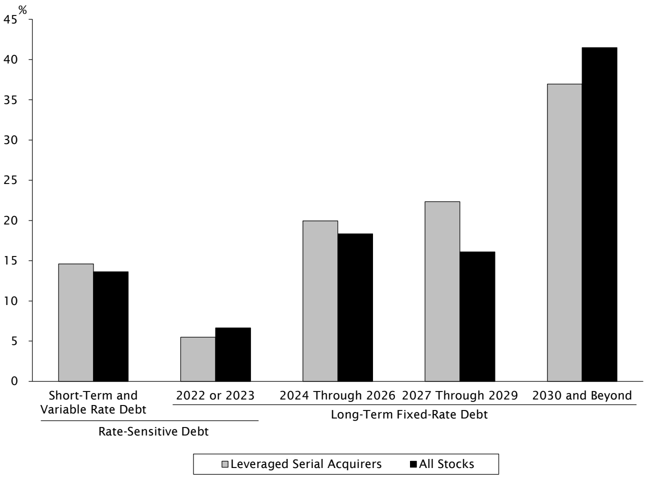
Source: Empirical Research Partners Analysis.

[1] Aggregate data smoothed on a trailing three-month basis.

The issue, then, isn't the viability of the companies themselves as going concerns: as a group they have an average EBIT interest coverage ratio of almost seven times, lower than the market but ample by historical standards, and like the rest of the market they're very long financed (see Exhibits 16 and 17). In fact, the stocks are significantly underrepresented on our longstanding Failure Model (see Exhibit 18).

Rather, the concern is that debt-financed dealmaking has been at the heart of the business model and the market doesn't believe they have a proven recipe for driving growth without it. Those are legitimate concerns, but the stocks' valuations give us some wiggle room to look for issues where the fears might be overblown, particularly in a setting where we think free cash flows will matter more than top-line growth. Appendix 1 on page 10 sorts the Leveraged Serial Acquirers through the lens of our Growth Model, looking for stocks with a GARP-y character where substantial free cash flows and a favorable valuation might offset a slowdown in debt-financed growth.

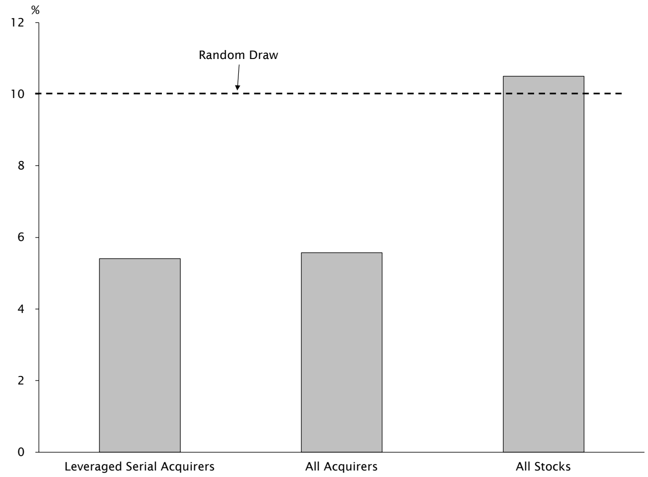
Exhibit 17: Large-Capitalization Stocks[1]
Distribution of Debt Outstanding
by Coupon Type and Maturity
As of Early-October 2022



Source: Empirical Research Partners Analysis.

[1] Excludes financials and REITs.

Exhibit 18: Large-Cap Stocks (ex-Financials & Real Estate)
Share in the Worst Decile of the Failure Model
As of Early-October 2022



Source: Empirical Research Partners Analysis.

[1] Equally-weighted data. Leveraged serial acquirers are stocks simultaneously in the highest two quintiles of (1) number of acquisitions in past five years; (2) cumulative value of those acquisitions relative to market cap; and (3) cumulative value of debt raised relative to total assets over past five years. All acquirers are stocks that have done at least one acquisition in the past five years.

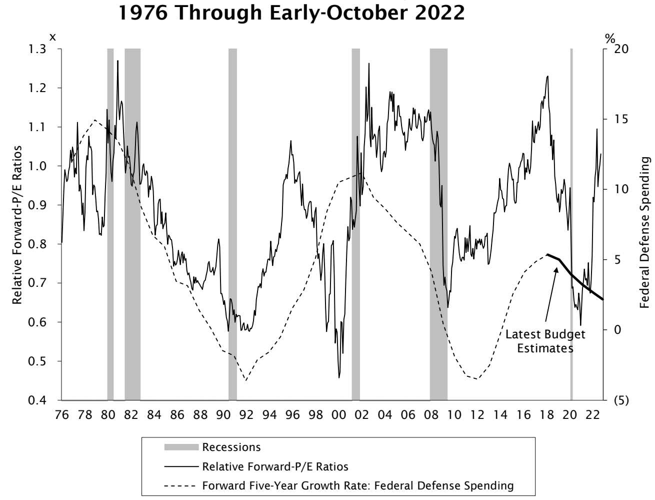
Playing Defense with Defense

Any Upside Left?

It goes without saying the defense stocks have seen a huge re-rating this year. Since the war began the stocks have erased a (30)% forward P/E discount to the market and are now priced at nearly parity, a fairly high valuation by their standards (see Exhibit 19). The question now is whether there's anything left in the arsenal?

The dashed line in the chart shows the five-year *forward* growth rate in Federal defense spending and loosely speaking, the sector's relative valuation has tracked that over the long-run. The White House's latest budget estimates envision slowing defense spending growth over the next five year, which is a bit worrisome given the high relative valuation we're starting at.

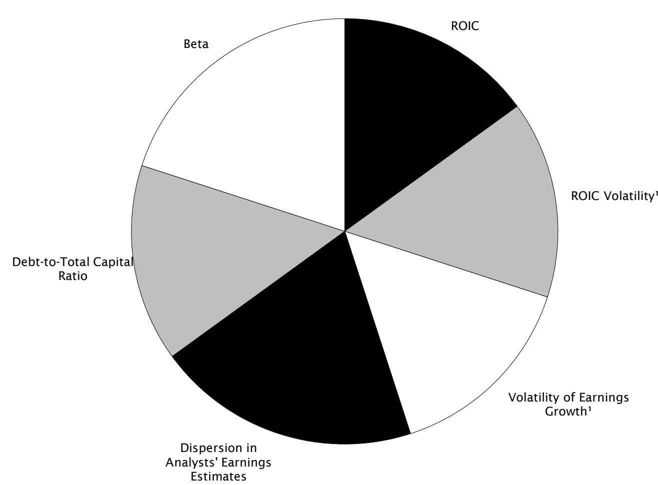
Exhibit 19: Large-Capitalization Defense Stocks
Relative Forward-P/E Ratios[1]
and Forward Five-Year Growth Rate
of Federal Defense Spending
1976 Through Early-October 2022



Source: White House Office of Management and Budget. Corporate Reports, Empirical Research Partners Analysis.

[1] Capitalization-weighted data.

Exhibit 20: The Fundamental Stability Score
Factor Composition
As of October 2022

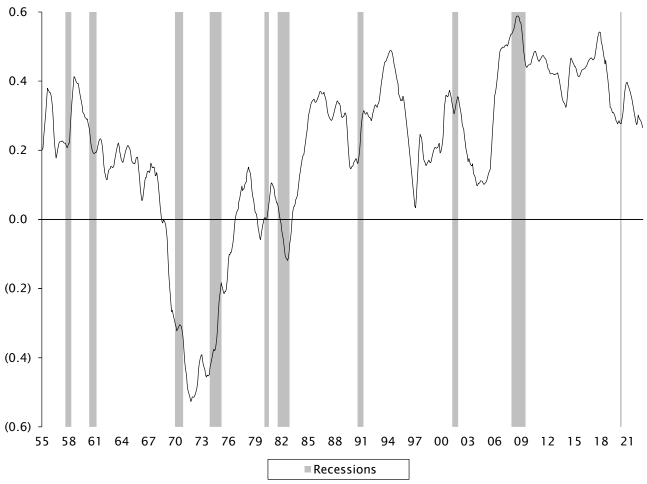


Source: Empirical Research Partners Analysis.

[1] Computed over the trailing twelve quarters.

On the other hand, the stocks do offer an attribute we call Fundamental Stability, an all-round measure of the consistency and predictability of the firm's earnings growth, its return on capital, and its leverage and beta (see Exhibits 20 overleaf, and 21). Investors of course gravitate towards the stability when things are going wrong and this time around the relative returns of the defense stocks have been very negatively correlated with bond returns, meaning they've been doing well when rates go up (see Exhibit 22). The more it looks like rising rates will break things, the better the defense sector has fared.

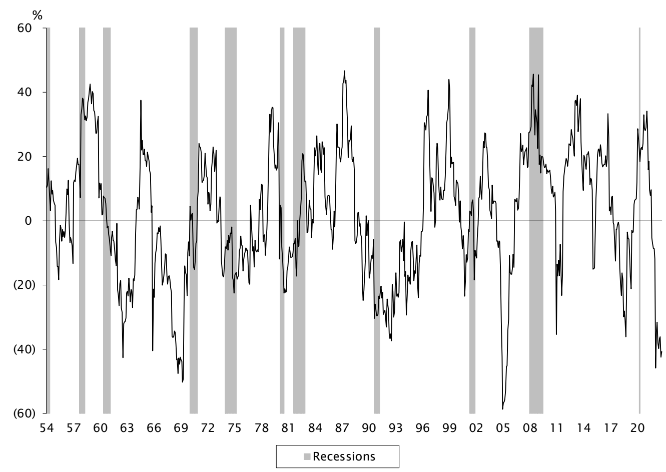
**Exhibit 21: Large-Capitalization Defense Stocks
Fundamental Stability Score[1]
1955 Through September 2022**



Source: Empirical Research Partners Analysis.

[1] Capitalization-weighted data smoothed on a trailing six-month basis.

**Exhibit 22: Large-Cap Defense Stocks
Correlation of Relative Returns with the
Total Return of U.S. Treasury Bonds[1]
1954 Through September 2022**



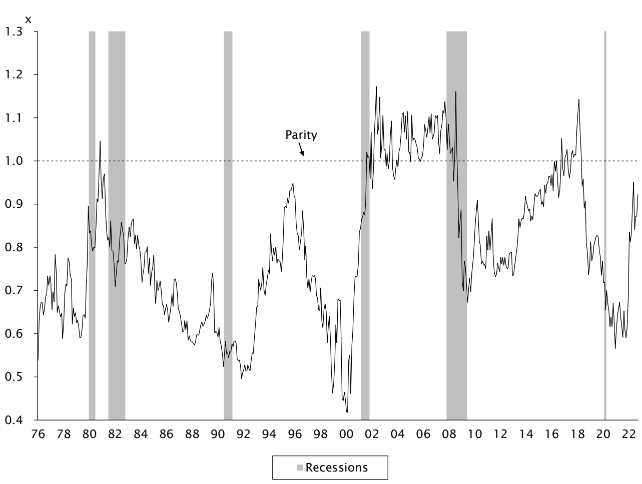
Source: National Bureau of Economic Research, Empirical Research Partners Analysis.

[1] Constructed using trailing two-year equally-weighted returns.

Discount Defensives?

Compared to the broader cohort of Fundamentally-Stable businesses, the defense stocks are trading at a (10)% forward P/E discount (see Exhibit 23). That's not a table-pounder but it is lower than other classic defensive plays in the market: staples and utilities are trading at +10% and +15% forward P/E premium to the market, respectively.

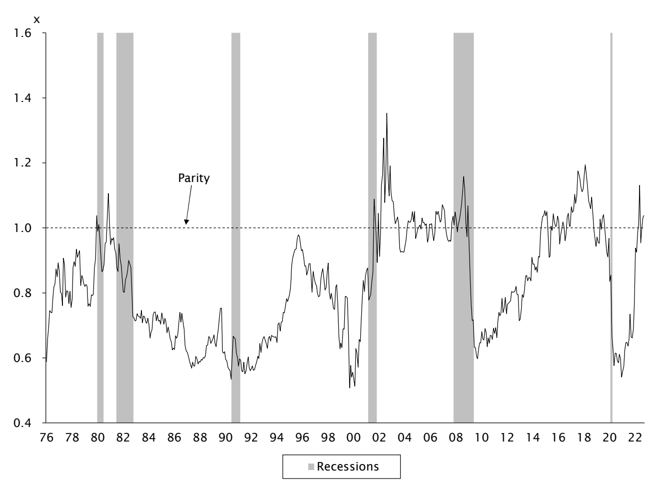
**Exhibit 23: Large-Capitalization Defense Stocks
Forward-P/E Ratio Relative to that for the
Highest Quintile of Fundamental Stability[1]
1976 Through Early-October 2022**



Source: Empirical Research Partners Analysis.

[1] Capitalization-weighted data.

**Exhibit 24: Large-Capitalization Defense Stocks
Forward-P/E Ratio Relative to that for
Capital Equipment Stocks[1]
1976 Through Early-October 2022**

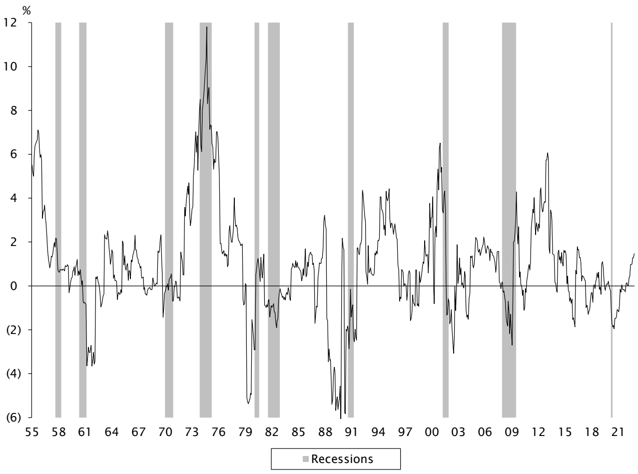


Source: Empirical Research Partners Analysis.

[1] Capitalization-weighted data.

The defense stocks are also priced to about the same forward multiple as their *non-defense* capital goods peers and a modest free cash flow yield premium (see Exhibits 24 overleaf, and 25). However, as we've argued recently, the industrial capital equipment makers look quite richly valued, which means the defense stocks certainly aren't outright cheap either. However, there is a case to be made for defense as a higher free cash flow yield alternative for some industrials exposure.[1]

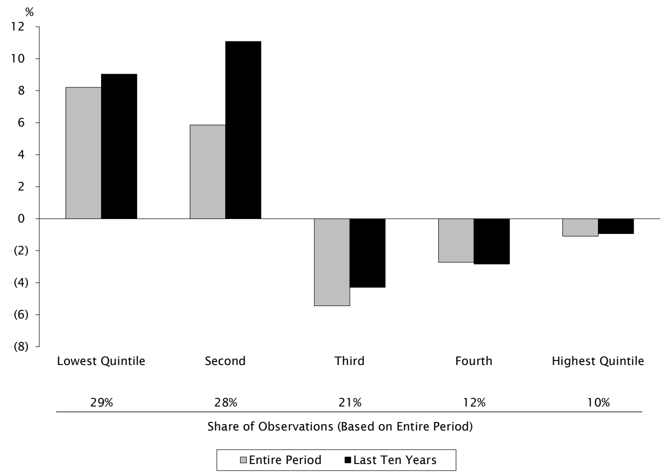
Exhibit 25: Large-Capitalization Defense Stocks
Free Cash Flow Yield Relative to that for Capital Equipment Stocks[1]
1955 Through Early-October 2022



Source: Empirical Research Partners Analysis.

[1] Capitalization-weighted data. Adjusted for Lockheed Martin's voluntary 2018 pension contribution.

Exhibit 26: Large-Capitalization Defense Stocks
Relative Returns by Trailing-P/E Ratios[1]
Monthly Data Compounded to Annual Periods
1952 Through September 2022

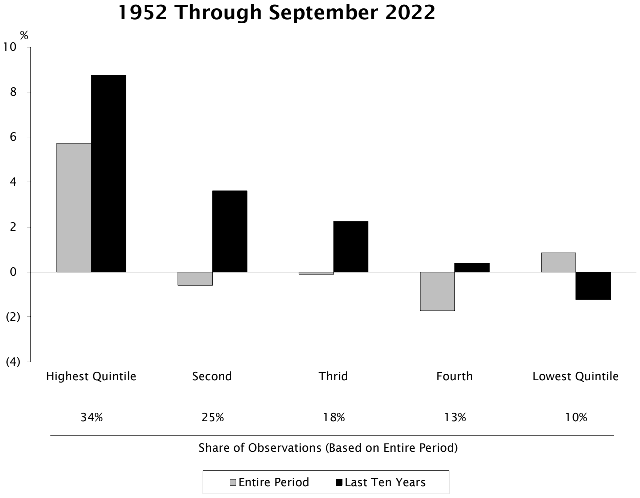


Source: Empirical Research Partners Analysis.

[1] Equally-weighted data, ranked across and return relative to the market.

Over the long-run, the empirical evidence suggests that the starting valuation in defense stocks does matter, a lot. On average defense stocks have outperformed the market when they're valued in the lowest two quintiles of P/E ratios market-wide (see Exhibit 26). The same applies for defense stocks that have scored in the highest quintile of free cash flow-to-enterprise value market-wide (see Exhibit 27). Our Capital Deployment framework has also been helpful in picking stocks in the space over the long-run (see Exhibit 28).

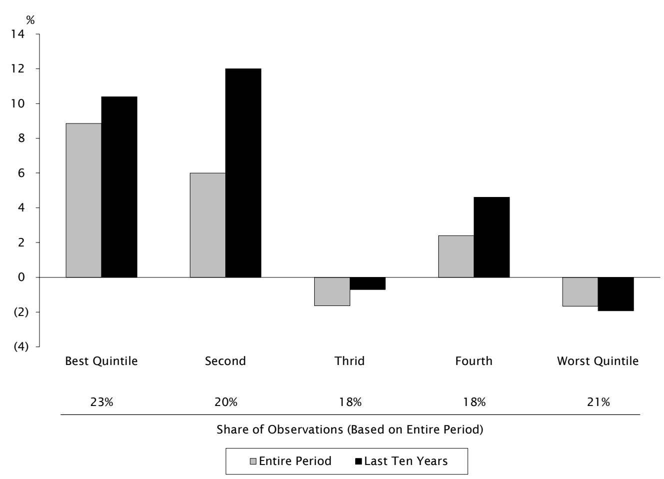
Exhibit 27: Large-Capitalization Defense Stocks
Relative Returns by Free Cash Flow-to-Enterprise Value Yields[1]
Monthly Data Compounded to Annual Periods
1952 Through September 2022



Source: Empirical Research Partners Analysis.

[1] Equally-weighted data, ranked across and return relative to the market.

Exhibit 28: Large-Capitalization Defense Stocks
Relative Returns by Capital Deployment Super Factor[1]
Monthly Data Compounded to Annual Periods
1952 Through September 2022



Source: Empirical Research Partners Analysis.

[1] Equally-weighted data, ranked across and return relative to the market.

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[1] *Portfolio Strategy* September 2022. "A Clean Capex Supercycle?"

As shown in Appendix 2, below, none of the defense issues currently rank in the lowest quintile of P/E, although three qualify for the second-lowest quintile. No stocks score in the highest quintile of free cash flow-to-enterprise value or the best quintile of capital deployment either. That's a fair summary of where things stand in the sector: the price of entry is too rich to make a full-throated endorsement but there are a few stock-level ideas that might be worth considering as alternatives to the classic defensives. Lockheed Martin tops the list based on the metrics that have historically been efficacious in picking stocks in the sector.

Appendix 1: Leveraged Serial Acquirers
Sorted by Growth Model Rank, Free Cash Flow Margins, and Capitalization
As of Early-October 2022

			Quintiles (1=Best; 5=Worst)[1]												
			In the Past Five Years:					Super Factors							
Symbol	Company	Price	Number of Acquisitions (5=Highest)	Cumulative Value of Acquisitions -to-Cap (5=Highest)	Debt Raised -to-Assets (5=Highest)	**Free Cash Flow Margin**	Free Cash Flow-to-Enterprise Value	Capital Deployment	Earnings Quality and Trend	Market Reaction	Valuation	Machine Learning Algorithm	**Growth Model Rank**	Forward P/E-Ratio	YTD Return	Market Capitalization ($ Billion)
AVGO	BROADCOM INC	$437.70	5	5	5	**1**	1	1	1	3	2	2	**1**	10.8 x	(32.7) %	$182.4
ADSK	AUTODESK INC	191.03	5	4	4	**1**	3	1	1	4	3	1	**1**	26.6	(32.1)	41.3
NUE	NUCOR CORP	118.07	5	4	4	**2**	1	1	2	1	1	1	**1**	6.3	4.8	30.9
TDG	TRANSDIGM GROUP INC	531.52	5	5	5	**2**	3	2	1	1	4	3	**1**	25.7	(14.1)	28.8
CSGP	COSTAR GROUP INC	72.71	5	5	4	**2**	4	4	1	2	5	3	**1**	63.2	(8.0)	28.8
BLDR	BUILDERS FIRSTSOURCE	64.09	5	5	4	**2**	1	1	1	4	1	1	**1**	7.0	(25.2)	10.3
ADBE	ADOBE INC	285.72	5	4	5	**1**	2	1	1	4	3	3	**2**	19.0	(49.6)	133.4
GILD	GILEAD SCIENCES INC	64.46	5	5	4	**1**	1	2	2	4	1	1	**2**	10.4	(8.0)	80.8
PTC	PTC INC	107.14	4	4	5	**1**	3	1	3	1	4	3	**2**	21.7	(11.6)	12.6
CNC	CENTENE CORP	73.76	4	5	5	**4**	1	3	4	1	1	1	**2**	12.7	(10.5)	42.9
HII	HUNTINGTON INGALLS IND INC	235.06	4	4	5	**4**	2	5	3	1	3	3	**2**	15.1	28.0	9.4
GPN	GLOBAL PAYMENTS INC	109.75	5	5	4	**1**	2	2	4	3	2	1	**3**	10.9	(18.3)	30.4
AKAM	AKAMAI TECHNOLOGIES INC	79.88	4	4	4	**1**	2	2	3	4	2	1	**3**	15.1	(31.7)	12.7
MGM	MGM RESORTS INTERNATIONAL	31.42	4	5	5	**2**	2	4	4	2	2	3	**3**	53.3	(30.0)	12.5
CLF	CLEVELAND-CLIFFS INC	15.59	4	5	4	**2**	1	4	4	4	1	1	**3**	7.7	(28.4)	8.1
CSL	CARLISLE COS INC	291.70	4	4	5	**4**	4	5	3	1	4	4	**3**	13.9	18.4	15.1
SSNC	SS&C TECHNOLOGIES HLDGS INC	47.44	5	5	5	**1**	1	4	4	4	2	3	**4**	9.5	(41.6)	12.1
OTEX	OPEN TEXT CORP	26.19	5	5	4	**1**	1	4	3	5	1	3	**4**	8.1	(43.8)	7.1
TMO	THERMO FISHER SCIENTIFIC INC	510.84	5	4	4	**2**	3	4	3	3	4	4	**4**	22.9	(23.3)	200.1
PYPL	PAYPAL HOLDINGS INC	84.52	5	5	4	**2**	2	2	3	5	2	2	**4**	19.1	(55.2)	97.7
CP	CANADIAN PACIFIC RAILWAY LTD	68.40	4	5	5	**2**	4	5	4	1	5	5	**4**	22.0	(4.3)	63.8
FISV	FISERV INC	98.49	4	5	4	**2**	3	4	4	2	3	3	**4**	14.3	(5.1)	63.3
BKI	BLACK KNIGHT INC	64.88	5	5	5	**2**	3	3	4	3	4	4	**4**	23.8	(21.7)	10.1
ENTG	ENTEGRIS INC	80.39	5	5	5	**3**	4	5	4	4	3	5	**4**	18.1	(41.8)	12.0
BSX	BOSTON SCIENTIFIC CORP	39.64	5	4	4	**4**	4	5	4	2	4	4	**4**	21.2	(6.7)	56.7
LDOS	LEIDOS HOLDINGS INC	91.89	4	4	4	**4**	2	2	5	2	2	4	**4**	13.7	4.5	12.6
SYNH	SYNEOS HEALTH INC	47.22	4	4	4	**4**	2	4	4	3	3	5	**4**	9.3	(54.0)	4.8
PKI	PERKINELMER INC	121.35	5	5	5	**2**	2	5	4	5	3	5	**5**	19.6	(39.6)	15.3
FFIV	F5 INC	143.54	4	4	4	**2**	2	2	5	4	2	3	**5**	13.3	(41.3)	8.5
CABO	CABLE ONE INC	799.32	5	5	5	**2**	2	3	4	5	3	5	**5**	15.1	(54.4)	4.7
BAX	BAXTER INTERNATIONAL INC	54.98	4	5	5	**3**	3	5	4	5	3	4	**5**	15.5	(35.2)	27.7
TTWO	TAKE-TWO INTERACTIVE SFTWR	117.93	4	5	5	**3**	4	4	5	5	5	5	**5**	23.6	(33.6)	19.7
CRL	CHARLES RIVER LABORATORIES I	201.36	5	4	5	**3**	4	5	4	5	4	5	**5**	18.0	(46.6)	10.2
SQ	BLOCK INC	56.62	4	5	5	**4**	4	3	5	5	4	5	**5**	48.1	(64.9)	33.4
TDY	TELEDYNE TECHNOLOGIES INC	337.90	4	5	5	**4**	4	3	5	1	5	5	**5**	18.9	(22.7)	15.8
CTLT	CATALENT INC	74.98	5	4	5	**5**	5	4	5	4	5	5	**5**	20.0	(41.4)	13.5
PHG	KONINKLIJKE PHILIPS NV	15.03	4	4	4	**5**	4	2	5	5	2	2	**5**	10.5	(57.9)	13.3

Source: Empirical Research Partners Analysis.

[1] All quintile ranks are relative to the entire large-cap universe.

Appendix 2: Large-Capitalization Defense Stocks
Sorted by the Average of Three Efficacious Metrics and Capitalization
As of Early-October 2022

			Quintiles (1=Best; 5=Worst)												
			Three Efficacious Metrics					Other Super Factors							
Symbol	Company	Price	Free Cash Flow-to-Enterprise Value	Trailing P/E-Ratio	Capital Deployment Super Factor	**Average of the Three**	Funda-mental Stability	Valuation	Earnings Quality and Trend	Market Reaction	Machine Learning Algorithm	Core Model Rank	Forward P/E-Ratio	YTD Return	Market Capitalization ($ Billion)
LMT	LOCKHEED MARTIN CORP	$409.99	2	2	2	**2.0**	1	3	1	1	1	1	15.1 x	17.6 %	$108.7
GD	GENERAL DYNAMICS CORP	225.41	2	3	3	**2.7**	1	2	3	1	2	2	17.1	10.5	61.8
RTX	RAYTHEON TECHNOLOGIES CORP	84.16	3	3	3	**3.0**	4	4	4	1	5	4	17.1	(0.5)	124.3
NOC	NORTHROP GRUMMAN CORP	503.83	4	2	3	**3.0**	1	4	3	1	4	4	19.6	31.6	78.0
LHX	L3HARRIS TECHNOLOGIES INC	230.44	3	3	3	**3.0**	2	3	3	2	4	3	16.6	9.6	44.1
HII	HUNTINGTON INGALLS IND INC	235.06	2	2	5	**3.0**	2	3	3	1	3	3	15.1	28.0	9.4

Source: Empirical Research Partners Analysis.