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Portfolio Strategy May 2018

Private Equity's Debt, A Problem?

One Trillion Dollars and Counting

- We estimate the debt burden of private equity-linked companies in the U.S. – which includes unlisted companies owned by private equity firms or involved in leveraged buyouts, plus the private equity firms themselves – is in the region of $1 to $1.2 trillion. That's about on par with the debt load of publicly-listed small-cap companies and one-fifth the size of the debt of large-cap companies. Whether it's big enough to represent a systemic threat depends critically on the structure of that borrowing, its rate sensitivity, and who owns it.
- To answer those questions we used a unique database of U.S. companies that contains every individual debt security issued along with the loans they've been drawn down going back to 2007. Aggregating everything from the ground up for the private equity-linked companies reveals that almost 60% of their outstanding debt is floating-rate debt, mostly tied to LIBOR. That obviously matters in a rising rate environment. Furthermore, another 9% is fixed-rate debt that matures within the next two years and thus potentially needs to be rolled over soon. So in all about 70% of private equity-linked borrowing, or more than $600 billion, is rate sensitive in the short-run.
- That means an increase in rates of say +100 basis points would have a meaningful impact on the net interest expense line for the private equity-linked companies, pushing the annual expense up by +11%, or about $6 billion per annum. Interest coverage ratios among *listed* companies are still robust in aggregate but we don't think that's the case among the companies involved with private equity. The average debt/EBITDA ratio for recent transactions has been close to six times, a threshold often considered the danger zone. At the margin higher rates alone could have consequences.
- If higher borrowing costs were to trigger a default cycle among private equity-linked firms, would it matter to the wider economy? That depends on who owns the debt. Banking crises have historically been devastating because they choke off credit to the whole system, whereas corporate default crises have usually been contained. So it's significant that 60% of private equity-linked debt is sourced from term loans, often issued by a consortium of banks. Currently the loans add up to a little less than 5% of the total credit of U.S. commercial banks, which is big enough to potentially cause a problem.

What About Public Companies?

- On the public side of the fence the debt burden looks high on face value, with the debt-to-equity ratio for the core of the large-cap market, which excludes financials and the commodities complex, now at an all time-high of 90%. Buyback activity has steadily reduced the denominator but the debt-to-asset ratio is also close to a record. For small-caps the numbers are higher still, with a debt-to-equity ratio that's been running above 100% for two years now.
- However, as with private companies the structure rather than the amount of debt is what determines its riskiness. For large-cap stocks about 80% of their $5 trillion debt is fixed-rate borrowing with a dollar-weighted maturity of almost eight years, and only about 10% needs to be rolled over in the next two years. As a result a +100 basis point increase in borrowing costs would only increase the aggregate interest expense by +4%, which would in turn only have a negligible impact on the aggregate EBIT interest coverage ratio. In contrast, small-caps have a larger rate exposure because about a third of their $1 trillion debt load is floating-rate.
- The overall debt structure for listed companies looks more benign than that for their private counterparts. But it's worth noting that a disproportionate number of cyclically-orientated businesses have the potent combination of elevated debt levels *and* weak fundamental stability. Appendix 1 on page 16 lists large-cap stocks with big, rate-sensitive debt burdens and sorts them by their fundamental stability. Appendix 2 has the small-caps. In both cases lots of stocks from technology, capital equipment, and consumer cyclicals feature.

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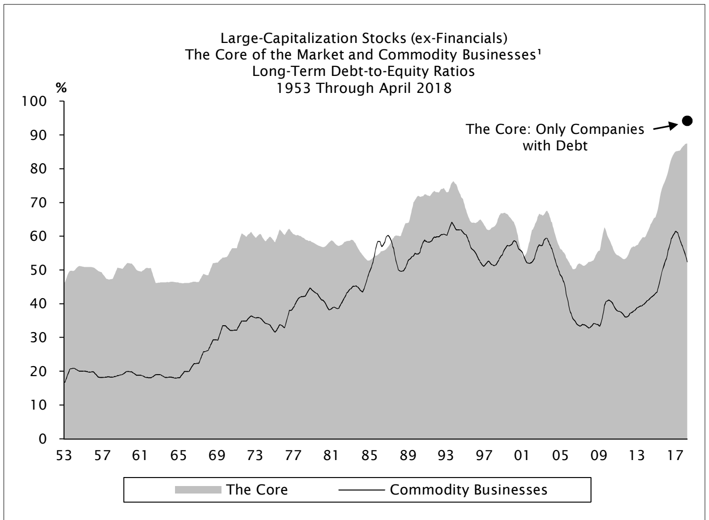
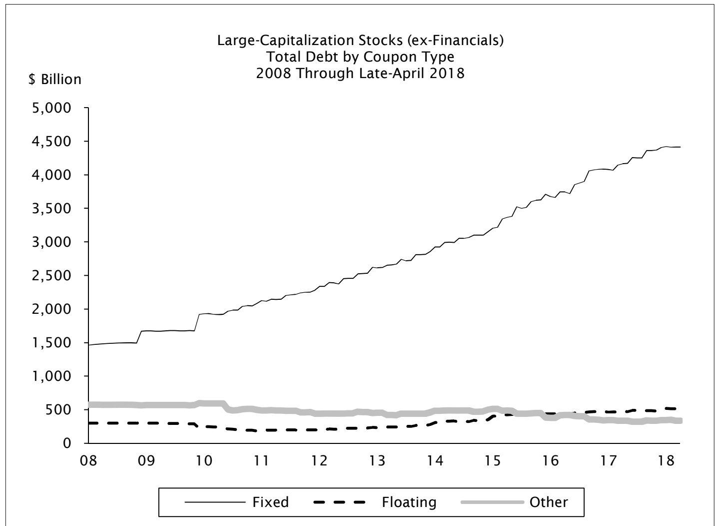
Conclusions in Brief

- On face value the debt burden for large-cap listed companies is high…



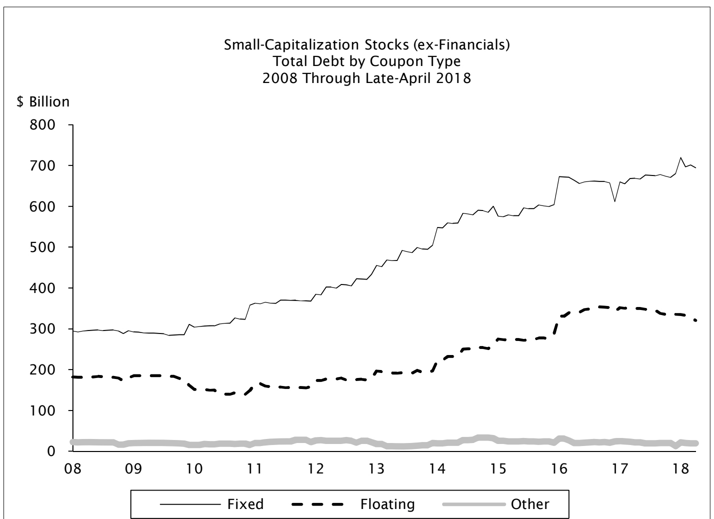
Source: Empirical Research Partners Analysis.
¹ The core excludes financials, energy and industrial commodities; data smoothed on a trailing six-month basis.

- …But 80% of the debt is fixed-rate and locked in for an average of six years:



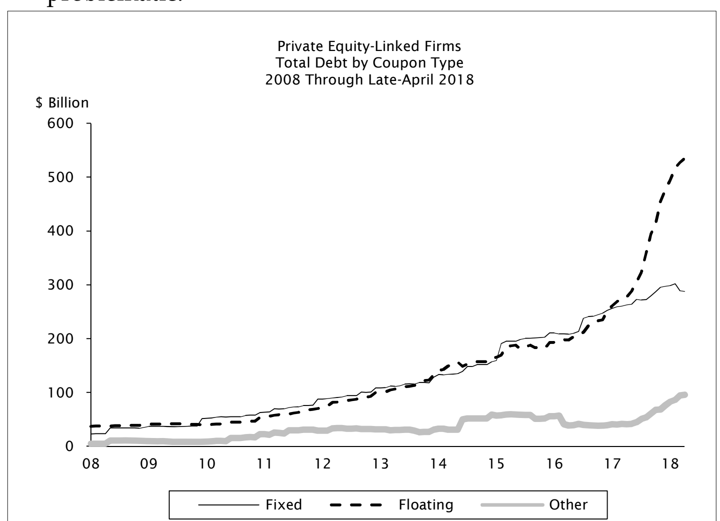
Source: FactSet Research Systems, Empirical Research Partners Analysis.

- Listed small-caps are more exposed to rising rates…



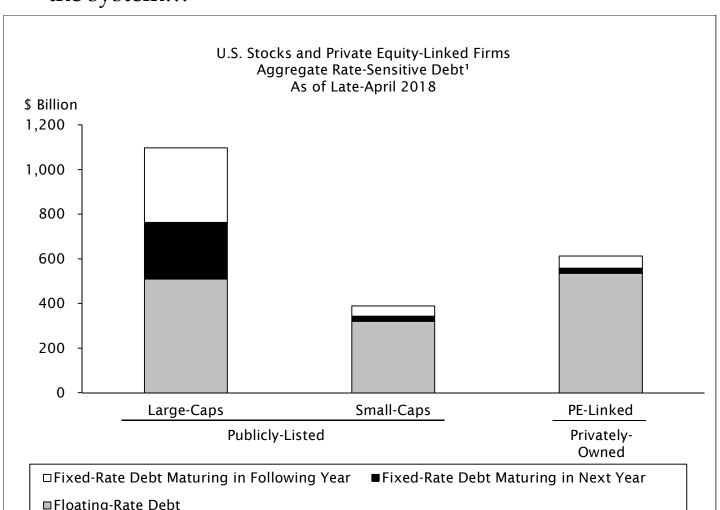
Source: FactSet Research Systems, Empirical Research Partners Analysis.

- …And private equity-linked firms are particularly problematic:



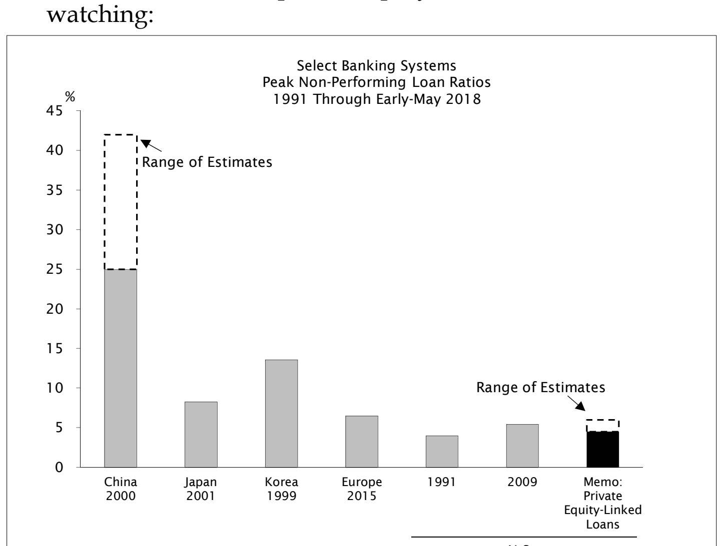
Source: FactSet Research Systems, Empirical Research Partners Analysis.

- In total there's about $2 trillion of rate-sensitive debt in the system…



Source: FactSet Research Systems, Empirical Research Partners Analysis.
¹ Rate-sensitive debt includes fixed-rate debt that matures within two years and all floating-rate debt.

- …And bank loans to private equity-linked firms are worth watching:



Source: BIS, IMF, FDIC, European Central Bank, Empirical Research Partners Analysis.

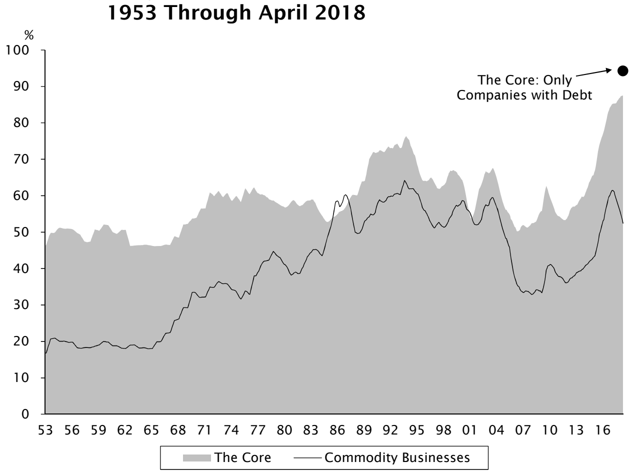
Private Equity's Debt, A Problem?

Debtors' Prison

A couple of centuries ago feckless folk who failed to pay their debts ended up in the bilge with a one-way ticket to Australia. Putting aside the fact that some might argue (usually whilst sipping a cocktail overlooking the surf at Bondi Beach) that in the very long run they got the better end of the trade, the ramifications for defaulting these days are often greater. Given the corporate borrowing binge since the Crisis it's worth asking whether overindulgence in the debt markets has created an overarching systemic risk.

We last looked into the issue two years ago when we examined the debt burden of the largest, publicly-listed firms in the U.S.[1] After studying the maturity profile of their debt load and the share that's fixed versus floating we concluded that the post-Crisis surge in borrowing was mostly a rational ploy to lock in low rates for the better part of a decade. However, since then the debt load for large-cap companies in the core of the market, which excludes financials and the commodities complex, has continued to rise and it's now at the highest level ever, especially if we exclude companies with no debt (see Exhibit 1). Stripping out the ample hoards of cash on the balance sheets brings it down a bit, but the numbers are still high enough to warrant a follow-up investigation (see Exhibit 2).

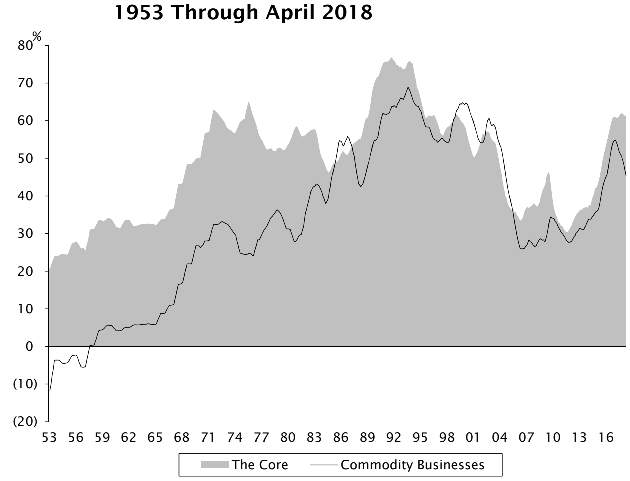
Exhibit 1: Large-Capitalization Stocks (ex-Financials)
The Core of the Market and Commodity Businesses[1]
Long-Term Debt-to-Equity Ratios
1953 Through April 2018



Source: Empirical Research Partners Analysis.

[1] The core excludes financials, energy and industrial commodities; data smoothed on a trailing six-month basis.

Exhibit 2: Large-Capitalization Stocks (ex-Financials)
The Core of the Market and Commodity Businesses[1]
Net Debt-to-Equity Ratios
1953 Through April 2018



Source: Empirical Research Partners Analysis.

[1] The core excludes financials, energy and industrial commodities; data smoothed on a trailing six-month basis.

This time around we expand our analysis beyond the large-caps and focus in particular on smaller-cap listed companies as well as unlisted companies, two less-visible neighborhoods where the quality of borrowing might plausibly be more suspect. For the unlisted companies there's been a nonstop parade of private equity players bearing the gift of gearing this cycle, so we'll call those firms out for special scrutiny later in this report.

For small-cap *listed* companies, the debt burden is higher than in their large-cap brethren. For the core of the market the long-term debt-to-equity ratio has exceeded 100% for more than two years now (see Exhibit 3). As in large-caps adjusting for cash on the balance sheets reduces the aggregate leverage of the system, to around 80% (see Exhibit 4). Of course buyback activity has been shrinking the denominator rapidly but the long-term debt-to-*assets* ratio for both large- and small-caps is also near all-time highs.

Despite the historically high debt burden, low interest rates mean the interest coverage ratio for listed companies isn't egregiously low by historical standards (see Exhibits 5 and 6). For large-caps in particular the aggregate EBIT coverage ratio is running at almost eight times, a reading that's higher than was achieved in each of the prior three cycles. The numbers in small-caps are less robust, with the core of the market delivering a coverage ratio of just under three times, which is about in-line with the average of the three cycles before this one. In other words, record low rates have been enough to offset the record debt load. But for how long?

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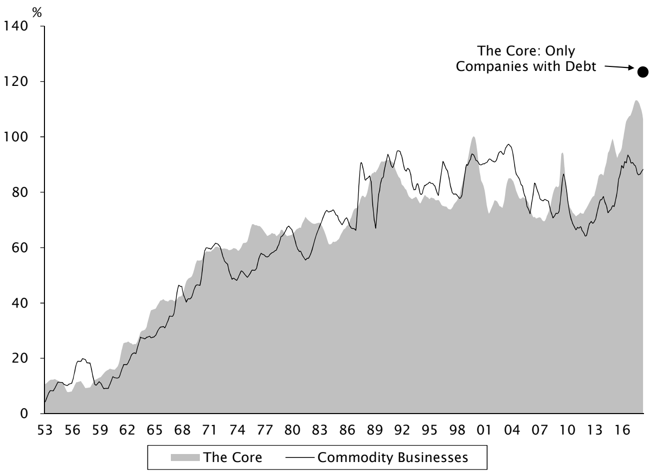
[1] *Portfolio Strategy* March 2017. "Debtors' Prison: The Structure of U.S. Corporate Borrowing."

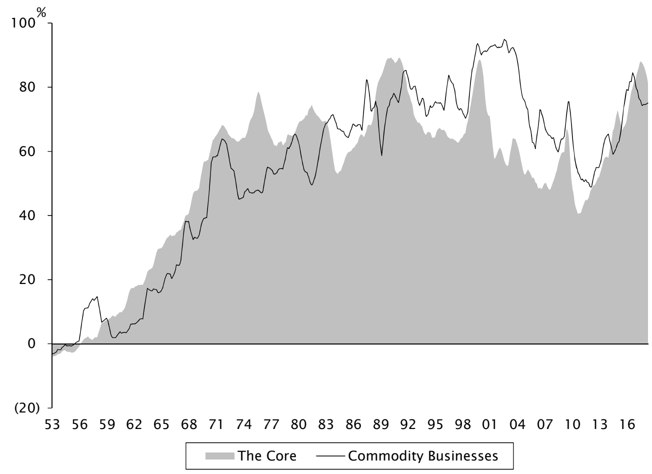
Exhibit 3: Small-Capitalization Stocks (ex-Financials)
The Core of the Market and Commodity Businesses[1]
Long-Term Debt-to-Equity Ratios
1953 Through April 2018



Source: Empirical Research Partners Analysis.

[1] The core excludes financials, energy and industrial commodities; data smoothed on a trailing six-month basis.

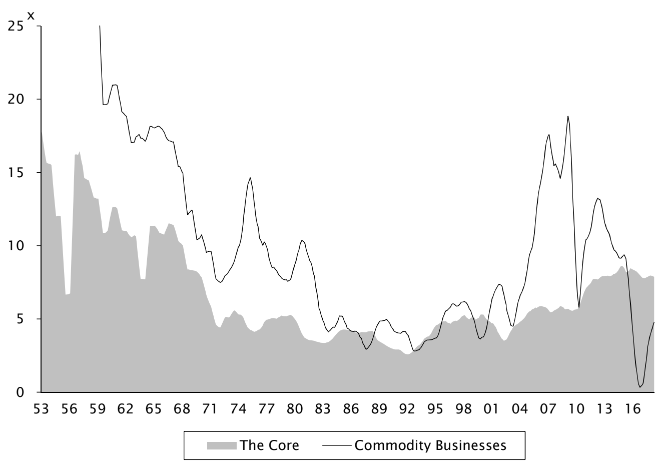
Exhibit 4: Small-Capitalization Stocks (ex-Financials)
The Core of the Market and Commodity Businesses[1]
Net Debt-to-Equity Ratios
1953 Through April 2018



Source: Empirical Research Partners Analysis.

[1] The core excludes financials, energy and industrial commodities; data smoothed on a trailing six-month basis.

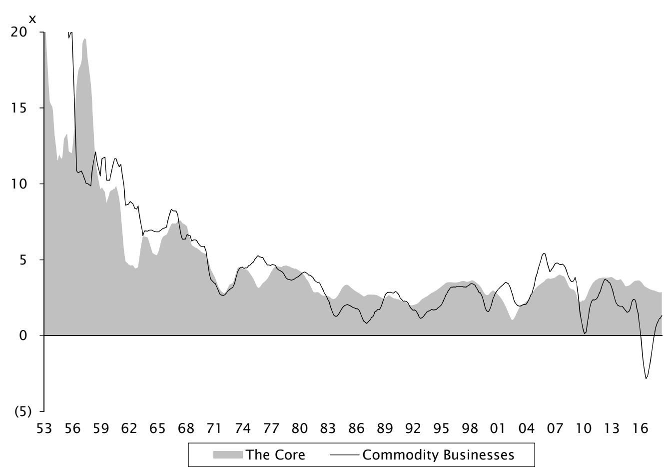
Exhibit 5: Large-Capitalization Stocks (ex-Financials)
The Core of the Market and Commodity Businesses[1]
EBIT Interest Coverage Ratios
1953 Through April 2018



Source: Empirical Research Partners Analysis.

[1] The core excludes financials, energy and industrial commodities; data smoothed on a trailing six-month basis.

Exhibit 6: Small-Capitalization Stocks (ex-Financials)
The Core of the Market and Commodity Businesses[1]
EBIT Interest Coverage Ratios
1953 Through April 2018



Source: Empirical Research Partners Analysis.

[1] The core excludes financials, energy and industrial commodities; data smoothed on a trailing six-month basis.

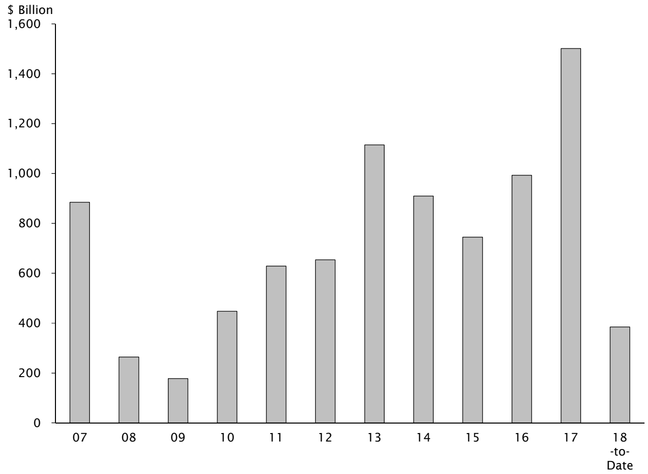
Indigestion, What Indigestion?

So far there hasn't been much evidence that debt investors are worried. For example, leverage loan issuance in the U.S. last year hit an all-time record of almost $1.6 trillion (see Exhibit 7). Of course, something like two-thirds of the activity was to refinance existing loans before the good times end, but still the total balance of outstanding loans continued to climb, approaching the $1 trillion mark by the end of the first quarter (see Exhibits 8 and 9).

Demand from floating rate mutual funds and ETFs for raw materials also accelerated over the past seven quarters, after a lull in 2015 and 2016 (see Exhibit 10). That's brought the total assets under management for these vehicles back near the high watermark set in 2014 (see Exhibit 11).

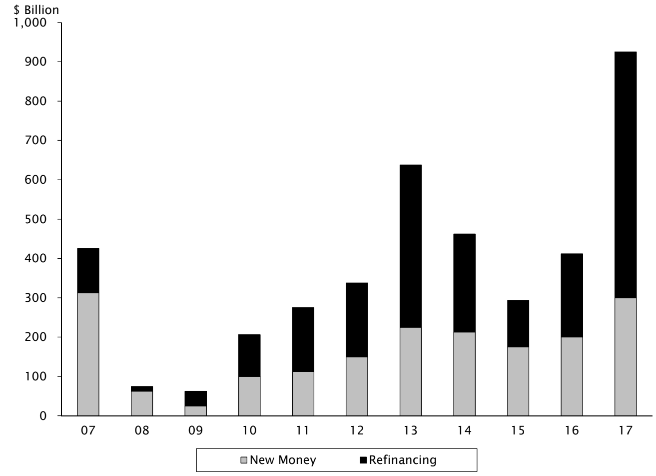
Ultimately a big reason why the buffet table is still open, despite already heaping plates, is the fact that leveraged loans have delivered the steady, *risk-adjusted* returns that investors have craved (see Exhibit 12). Almost a decade into the economic expansion the Sharpe ratio for a broad basket of leveraged loans easily tops that of the S&P 500, and in the past year it was a total rout (see Exhibit 13).

Exhibit 7: U.S. Leveraged Loans
Issuance by Year
2007 Through Late-April 2018



Source: Bloomberg L.P., Empirical Research Partners Analysis.

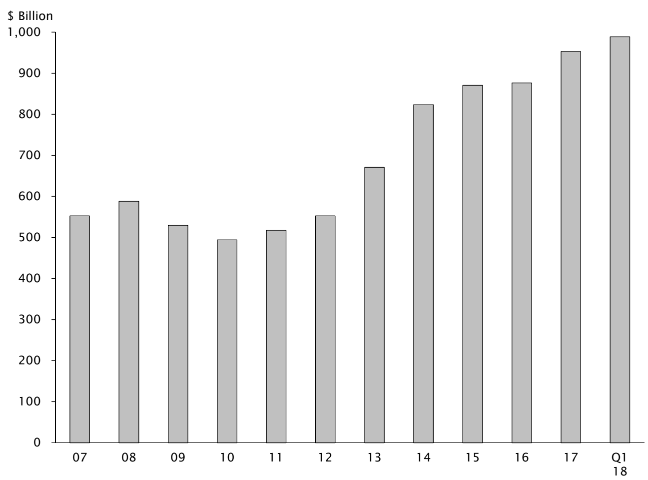
Exhibit 8: U.S. *Institutional* Leveraged Loans[1]
Issuance by Type and Year
2007 Through 2017



Source: S&P/LSTA, Empirical Research Partners Analysis.

[1] Institutional loans packaged for investors such as structured finance vehicles, mutual funds, insurance companies. Excludes pro rata debt.

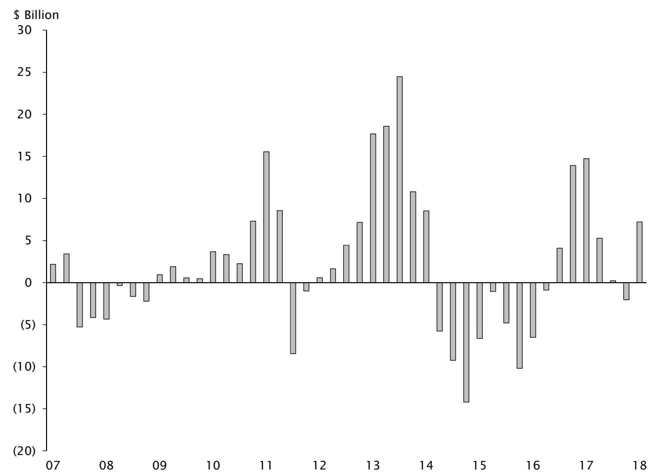
Exhibit 9: U.S. Leveraged Loans
Value of Outstanding Loans
2007 Through Q1 2018



Source: S&P/LSTA, Empirical Research Partners Analysis.

[1] Based on a broad universe defined by the constituents of the S&P/LSTA Leveraged Loan Index.

Exhibit 10: Corporate Floating Rate Mutual Funds and ETFs
Net New Money Flows
2007 Through Q1 2018



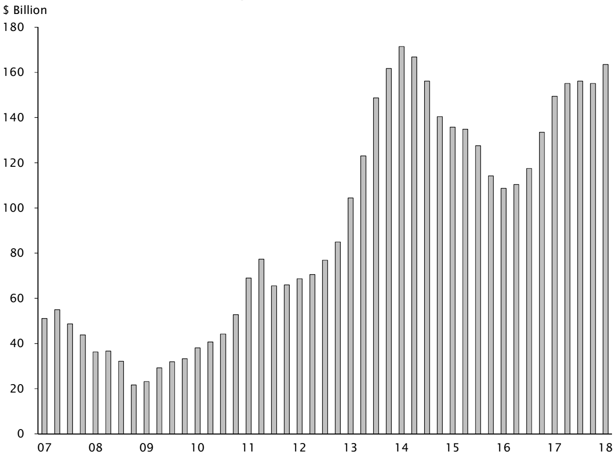
Source: Strategic Insight Simfund, Empirical Research Partners Analysis.

The thing with Sharpe ratios for bonds is they'll usually look good until the credit cycle starts to turn. On that note, the trailing 12-month default rate is currently the highest it's been since 2009, if we excise the massive Energy Future/TXU bankruptcy from the data (see Exhibit 14). Other signs of excess in the system are creeping up too: the average debt/EBITDA multiple for leveraged buyouts (LBOs) is edging up towards six times, the threshold often considered the danger zone, and debt issuance for those LBOs topped $100 billion last year, the biggest haul since just before the Crisis in 2007 (see Exhibits 15 and 16).

On the other hand, the total dollar value of leveraged loans hasn't risen at all relative to the borrowings of publicly-listed companies and is only up a little relative to the borrowing of all non-financial corporates, which includes private companies (see Exhibit 17).

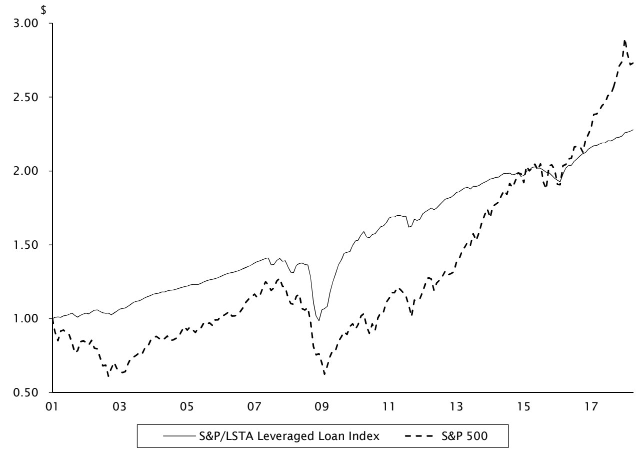
Putting everything together, the top-down data isn't really granular enough to assess the odds of a real crisis developing, so we rolled up our sleeves and took a detailed, instrument-by-instrument look at the structure of the debt load for publicly-listed large- and small-cap companies along with private equity-linked firms.

Exhibit 11: Corporate Floating Rate Mutual Funds and ETFs Assets Under Management 2007 Through Q1 2018



Source: Strategic Insight Simfund, Empirical Research Partners Analysis.

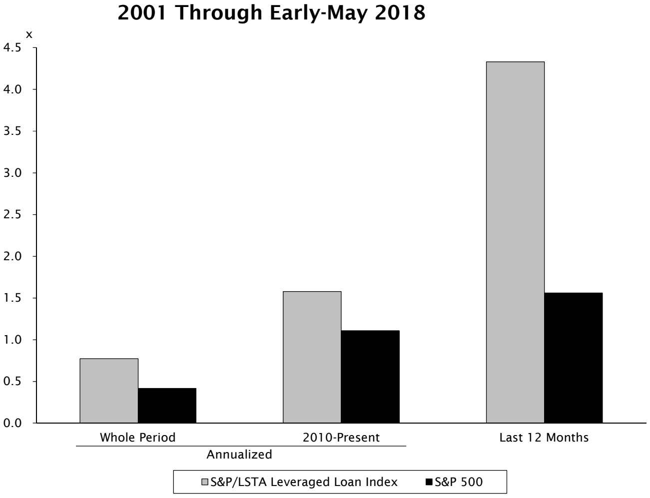
Exhibit 12: S&P/LSTA Leveraged Loan Index and the S&P 500 Growth of a Dollar Invested[1] 2001 Through Early-May 2018



Source: Standard & Poor's, LSTA, Empirical Research Partners Analysis.

[1] Based on total return indexes.

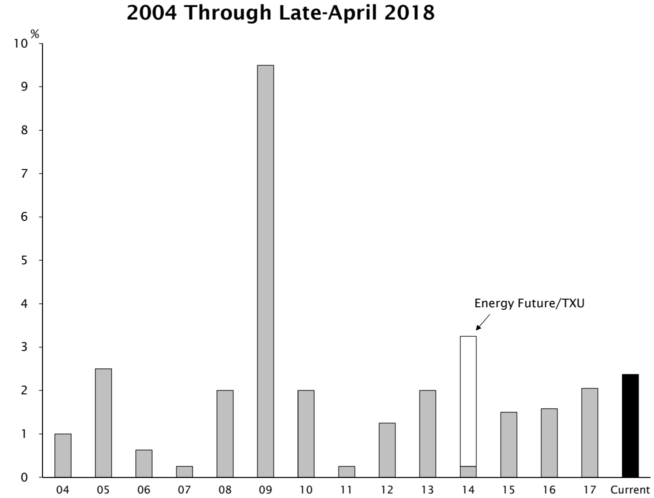
Exhibit 13: S&P/LSTA Leveraged Loan Index and the S&P 500 Sharpe Ratios 2001 Through Early-May 2018



Source: Standard & Poor's, LSTA, Empirical Research Partners Analysis.

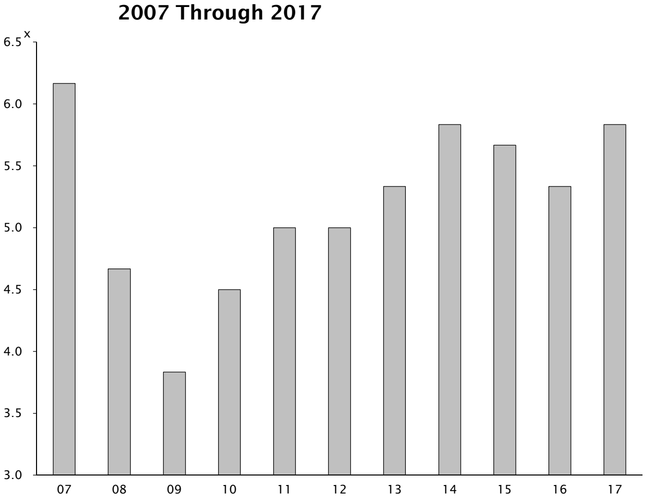
[1] Based on total return indexes.

Exhibit 14: U.S. Leveraged Loans Default Rate 2004 Through Late-April 2018



Source: S&P LCD, Empirical Research Partners Analysis.

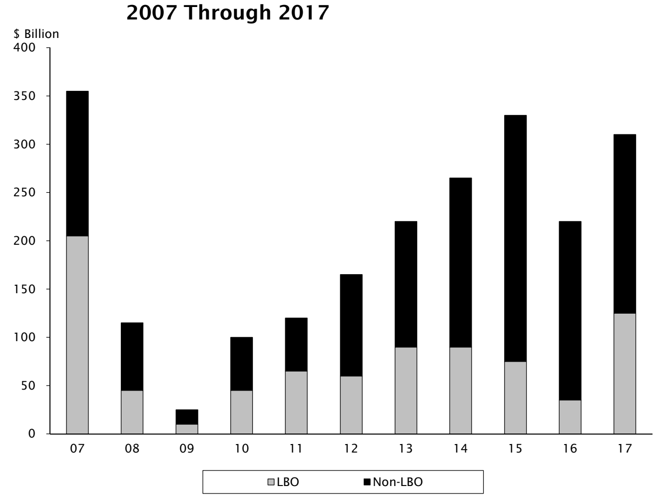
Exhibit 15: Large U.S. LBO Transactions[1] Average Debt/EBITDA Multiple 2007 Through 2017



Source: Bain & Company, S&P LCD, Empirical Research Partners Analysis.

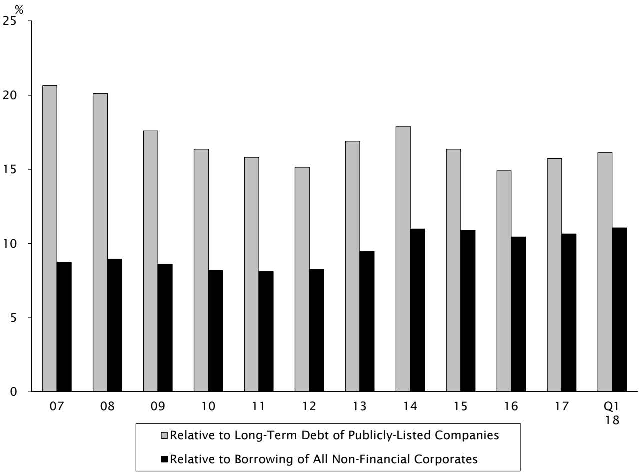
[1] Issuers with EBITDA greater than $50 million.

Exhibit 16: U.S. M&A Leveraged Loans Issuance by Type and Year 2007 Through 2017



Source: Thomson Reuters, Empirical Research Partners Analysis.

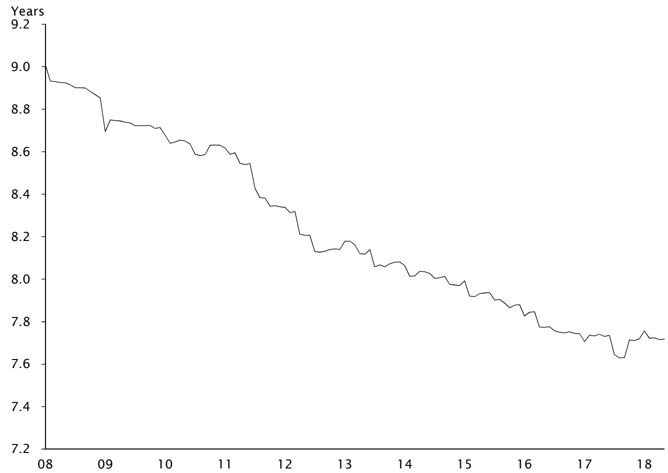
Exhibit 17: U.S. Leveraged Loans[1]
Value of Outstanding Loans Relative to the Long-Term Debt of Publicly-Listed U.S. Stocks and the Borrowing of All Non-Financial Corporates[2]
2007 Through Q1 2018



Source: S&P/LSTA, Board of Governors of the Federal Reserve, Empirical Research Partners Analysis.

[1] Based on a a broad universe defined by the constituents of the S&P/LSTA Leveraged Loan Index.
[2] Publicly-listed U.S. stocks are drawn from the largest 2,500 stocks. All Non-Financial Corporates includes unlisted, private companies.

Exhibit 18: Large-Capitalization Stocks (ex-Financials)
Weighted Average Maturity
2008 Through Late-April 2018



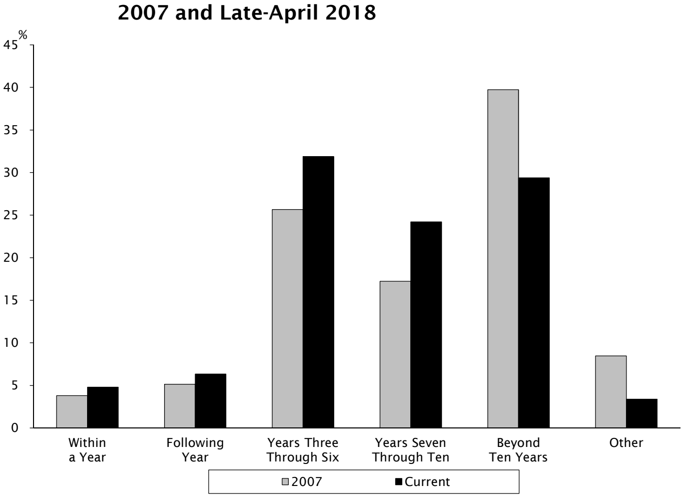
Source: FactSet Research Systems, Empirical Research Partners Analysis.

Large-Cap Listed Companies: Nothing to See Here, Move Along

To get a better sense for the risk embedded in the U.S. corporate debt load we used a unique Debt Capital Structure database from FactSet, a data vendor, to aggregate from the bottom-up every debt instrument that's been issued by large-cap listed companies over the past decade. From that number-crunching exercise the first thing worth noting is that the dollar-weighted maturity of all outstanding debt has been declining steadily, from about nine years back in 2008 to 7.7 years today (see Exhibit 18). That means the maturity distribution for the debt load has shifted left, with debt maturing in three-to-six years the most common bucket (see Exhibit 19). Despite that, debt that needs to be replaced in the next two years, and is thus most-exposed to rising rates, only amounts to about 10% of the total.

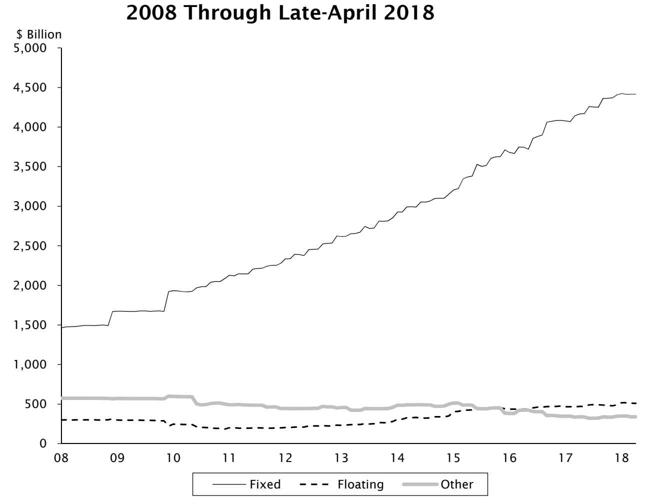
Furthermore, more than 80% of the debt issued by large-cap companies is at a fixed coupon, meaning the only real rate sensitivity is in the share of debt that potentially needs to be recycled as it comes due in the next couple of years (see Exhibit 20). For the vast majority of the debt on issue the impact of rising rates is negligible for the next two years.

Exhibit 19: Large-Capitalization Stocks (ex-Financials)
Share of Debt Maturing by Year
2007 and Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

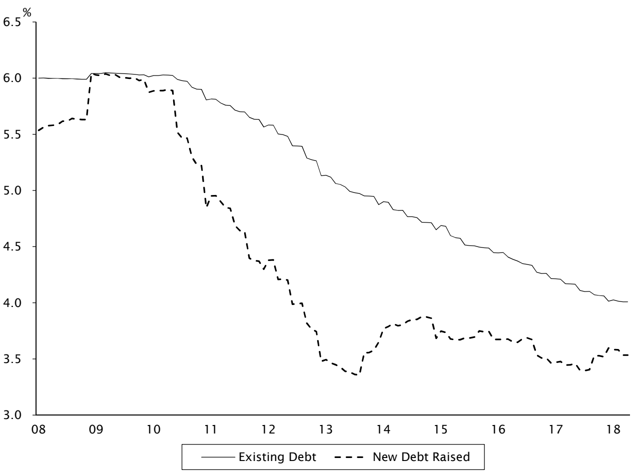
Exhibit 20: Large-Capitalization Stocks (ex-Financials)
Total Debt by Coupon Type
2008 Through Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

In fact, the coupon rate being paid on newly-issued debt is still running at about (50) basis points *below* the rate being paid on the overall debt burden (see Exhibit 21). That means rates would need to go up by another +50 basis points before refinancing activity would start to increase the aggregate net interest expense for the companies. So while the total debt outstanding looks high relative to equity (recall Exhibit 1) the structure of that debt is such that there's very little rate-sensitivity in the system: most of it is locked in at low fixed rates that don't need to be refinanced in the next couple of years.

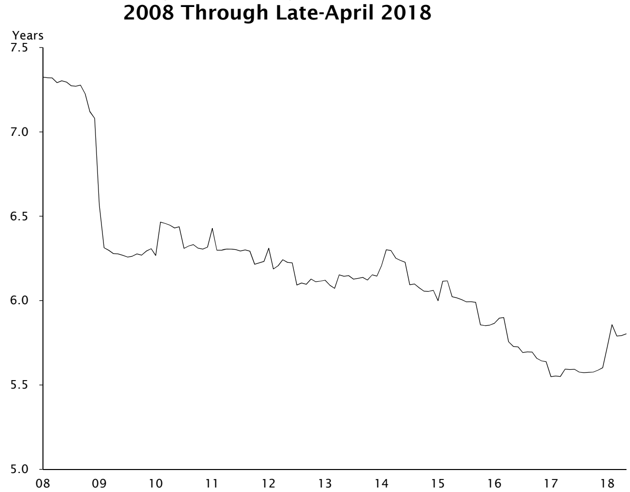
Exhibit 21: Large-Capitalization Stocks (ex-Financials)
Coupon Rate Paid on New and Existing Fixed-Rate Debt[1]
2008 Through Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Coupon is weighted by share of total debt outstanding; new debt is that raised over a trailing 12 month period.

Exhibit 22: Small-Capitalization Stocks (ex-Financials)
Weighted Average Maturity
2008 Through Late-April 2018

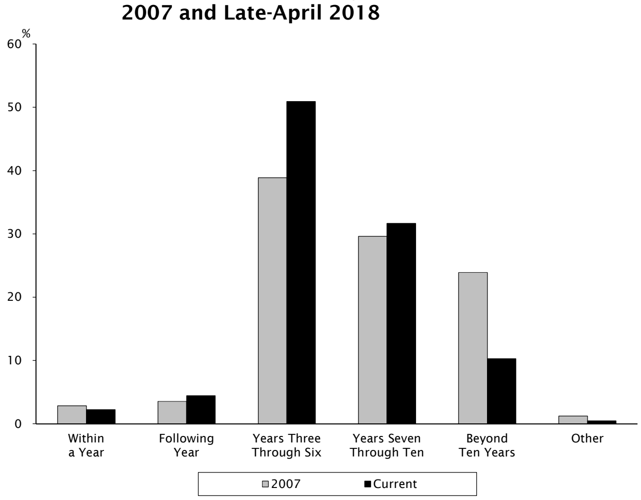


Source: FactSet Research Systems, Empirical Research Partners Analysis.

Small-Cap Listed Companies: More Floating Exposure

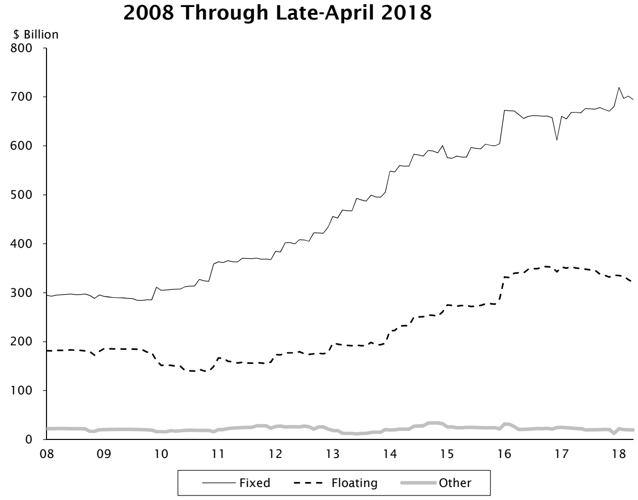
For listed small-caps companies the maturity profile isn't all that different. The dollar-weighted maturity of all outstanding debt is down to just under six years, but only 6% of that needs to be refinanced in the coming two years (see Exhibits 22 and 23). Where the picture is less sanguine though is in the mix of floating-rate versus fixed-rate debt. Unlike their large-cap brethren the small-caps source just under a third of their borrowing from floating-rate instruments, mostly tied to LIBOR (see Exhibit 24). That gives them a direct rate exposure that doesn't exist in the large-caps. It's also worth noting that each marginal dollar of new debt has been raised at about the same coupon as the existing debt burden, currently around 5.4% (see Exhibit 25). That means any increase in rates immediately flows through to a higher aggregate interest expense. We'll assess the magnitude of that later in this report.

Exhibit 23: Small-Capitalization Stocks (ex-Financials)
Share of Debt Maturing by Year
2007 and Late-April 2018



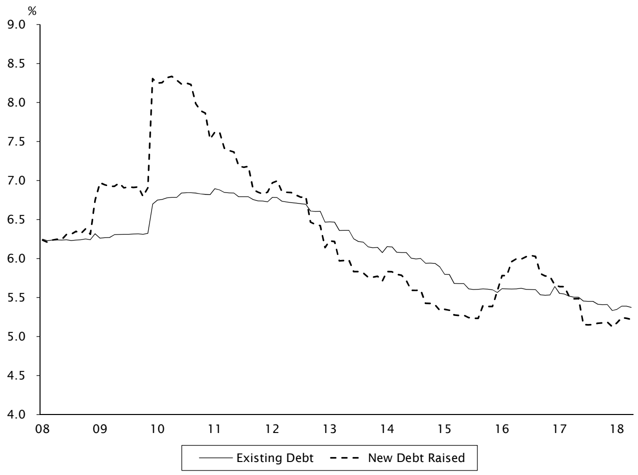
Source: FactSet Research Systems, Empirical Research Partners Analysis.

Exhibit 24: Small-Capitalization Stocks (ex-Financials)
Total Debt by Coupon Type
2008 Through Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

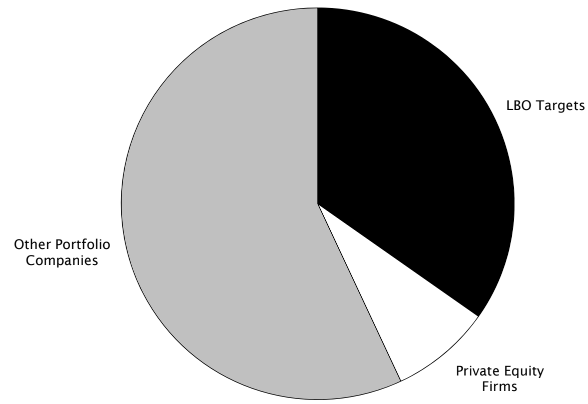
Exhibit 25: Small-Capitalization Stocks (ex-Financials)
Coupon Rate Paid on New and Existing Fixed-Rate Debt[1]
2008 Through Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Coupon is weighted by share of total debt outstanding; new debt is that raised over a trailing 12 month period.

Exhibit 26: Private Equity-Linked Firms
Share of Total Debt by Type of Company
As of Late-April 2018



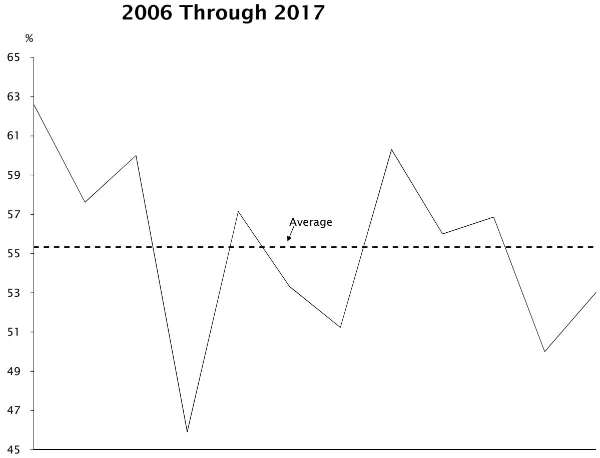
Source: FactSet Research Systems, Empirical Research Partners Analysis.

Private Equity-Linked Companies: Keep Them Under Surveillance

Much of the leveraged loan activity highlighted previously has taken place away from public equity markets and has been earmarked for private equity deals. Getting clean data on what happens in that corner of the market is harder, but nonetheless we can build up at least a sketch of what's going on by adding up all the debt instruments that are somewhat tied to private equity activity. To do that we collected all private companies that have been in the portfolios of private equity firms in the post-Crisis years, and then added LBO targets and the private equity firms themselves to the mix. Exhibit 26 shows how the total debt, which adds up to just under $1 trillion, is split among the players. All but the handful of big, listed private equity firms (e.g., Blackstone, KKR, Carlyle) are privately-owned.

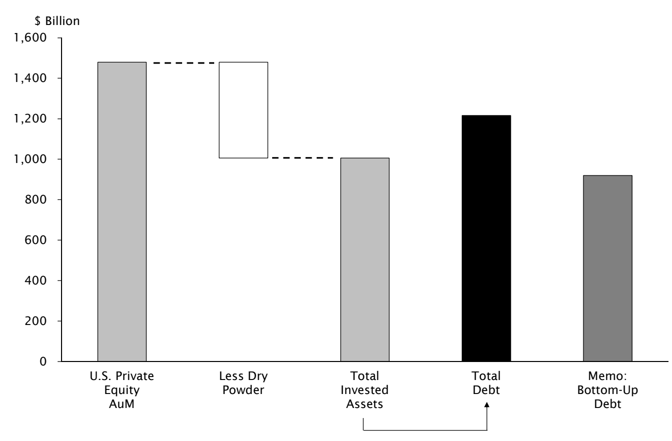
To try to tie out whether our bottom-up estimate of total private equity debt in the U.S. is reasonable we started with the fact that the total assets under management of U.S. private equity firms is around $1.5 trillion. Of that about one-third is currently dry powder so the actual invested equity is more like $1 trillion. Getting a read on the leverage employed by the private equity industry is imprecise but it's probably somewhere in the region of a 55% debt/enterprise value ratio (see Exhibit 27).[2] That would imply total debt of about $1.2 trillion (see Exhibit 28).

Exhibit 27: U.S. Private Equity Buyouts
Median Debt/EV Ratio
2006 Through 2017



Source: PitchBook, Empirical Research Partners Analysis.

Exhibit 28: U.S. Private Equity
Estimated Assets Under Management and Debt
As of Early-May 2018



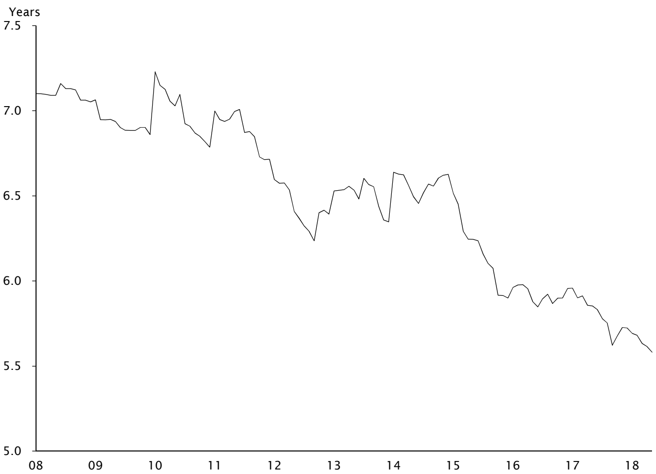
Source: McKinsey, PitchBook, Empirical Research Partners Analysis.

[2] That's also consistent with what academics have found: L'Her, J., Stoyanova, R., Shaw, K., Scott, W., and Charissa Lai, 2016, "A Bottom-Up Approach to the Risk-Adjusted Performance of the Buyout Fund Market." *Financial Analysts Journal*, Vol. 72, No. 4, pp. 36-48.

In comparison our bottom-up composite is $900 billion, which means in rough terms we're able to study the detailed structure of about 75% of the plausible total debt of private equity-owned companies. We think that's enough of a sample to glean some useful insights.

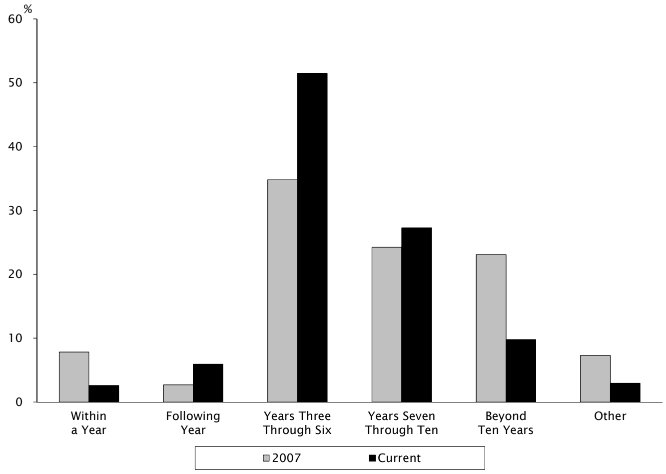
Interestingly, the maturity profile of the private equity-linked debt doesn't look that different from what we saw for their publicly-listed peers. The weighted maturity of all debt is about 5.5 years, a shade lower than that for listed small-caps, and the debt due in the next two years is about 9% (see Exhibits 29 and 30).

Exhibit 29: Private Equity-Linked Firms
Weighted Average Maturity
2008 Through Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

Exhibit 30: Private Equity-Linked Firms
Share of Debt Maturing by Year
2007 and Late-April 2018

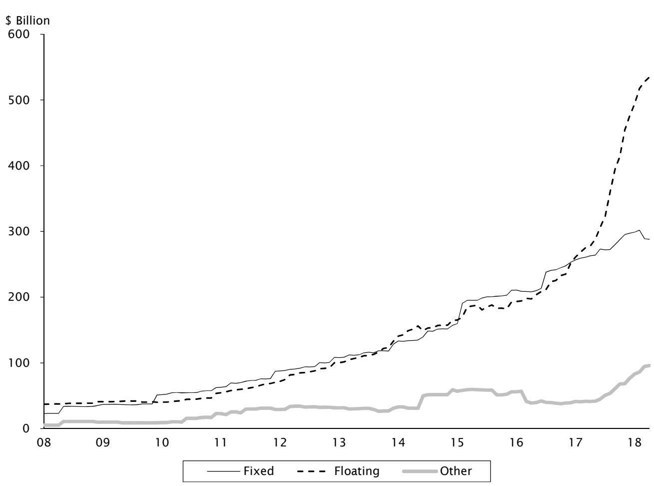


Source: FactSet Research Systems, Empirical Research Partners Analysis.

However, there is one critical difference: there's been a tremendous acceleration in the use of floating-rate debt, to the extent that it's now nearly 60% of all outstanding debt (see Exhibit 31). At the same time, the interest rate burden on existing fixed-rate debt and newly-issued debt is close to 6%, two points above the borrowing rate for large-cap listed companies (see Exhibit 32).

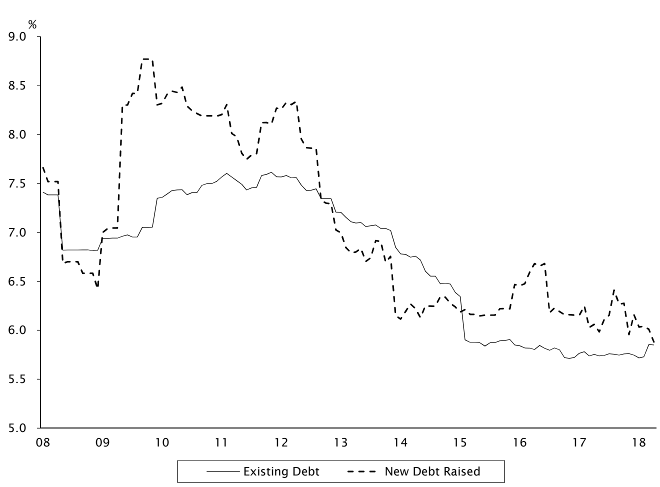
It's also noteworthy that in recent years those tapping the borrowing market for new fixed-rate debt have had to pay a higher rate than that on their existing debt, unlike large-cap listed companies that have been able to add debt at a cost well below their existing coupon.

Exhibit 31: Private Equity-Linked Firms
Total Debt by Coupon Type
2008 Through Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

Exhibit 32: Private Equity-Linked Firms
Coupon Rate Paid on New and Existing
Fixed-Rate Debt[1]
2008 Through Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

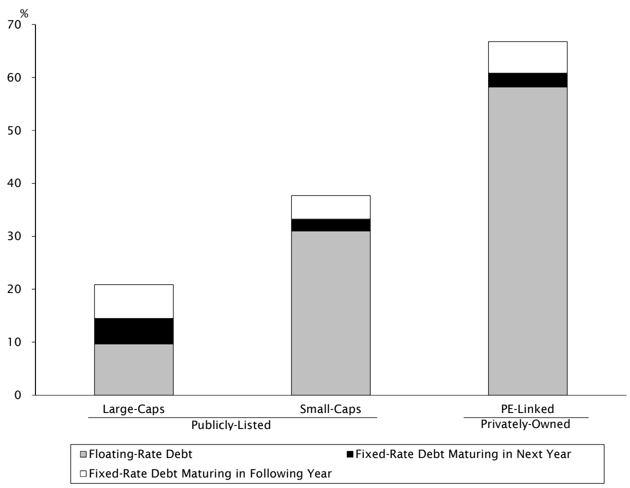
[1] Coupon is weighted by share of total debt outstanding; new debt is that raised over a trailing 12 month period.

The Bottom Line, Literally

Using our knowledge of the debt structure in each cohort we can model how an increase in rates could impact the bottom line. First, we define rate-sensitive debt as (1) fixed-rate debt maturing in the next two years (i.e., debt that needs to be replaced soon) plus (2) all floating-rate debt. As we've already seen, private equity-linked debt is by far the most rate-sensitive; in fact 70% of all private equity debt fits the bill (see Exhibit 33). At the other extreme, for listed large-caps only 20% of the debt load is exposed to rising rates.

However, from the perspective of the overall economy the numbers shake out in the opposite direction, because there the total *dollars* of debt are what matter (see Exhibit 34). That's because total debt for large-caps is about $5 trillion, or five times that of small-caps or private equity-linked firms, so the total dollars of rate-sensitive debt for large-caps is still bigger than the other cohorts (albeit not five times bigger).

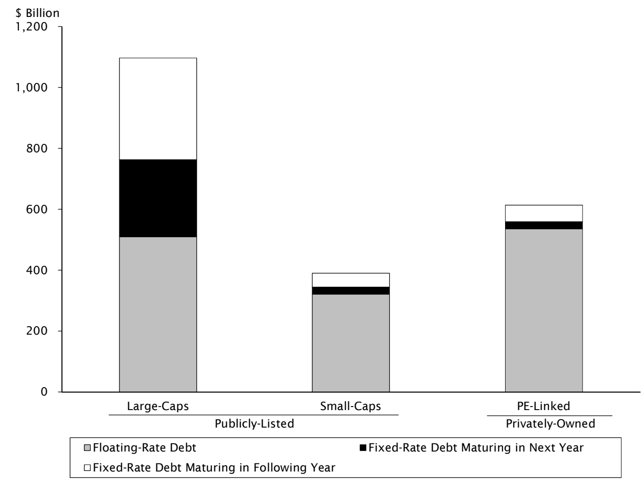
Exhibit 33: U.S. Stocks and Private Equity-Linked Firms
Rate-Sensitive Debt as Share of Total Debt in Each Cohort[1]
As of Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Rate-sensitive debt includes fixed-rate debt that matures within two years and all floating-rate debt.

Exhibit 34: U.S. Stocks and Private Equity-Linked Firms
Aggregate Rate-Sensitive Debt[1]
As of Late-April 2018

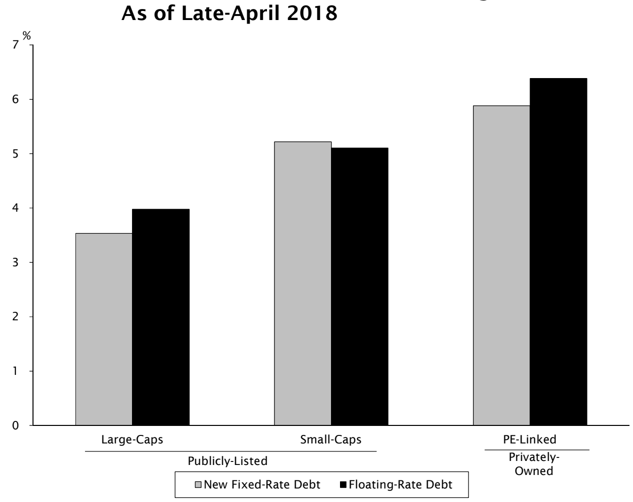


Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Rate-sensitive debt includes fixed-rate debt that matures within two years and all floating-rate debt.

The impact of rising rates is also a function of the cost of a marginal new dollar of debt, which is shown in Exhibit 35. Newly-issued fixed-rate debt has been costing large-cap firms about 3.5% while small-caps and private equity-linked companies have been borrowing fixed at 5% and 6% respectively.

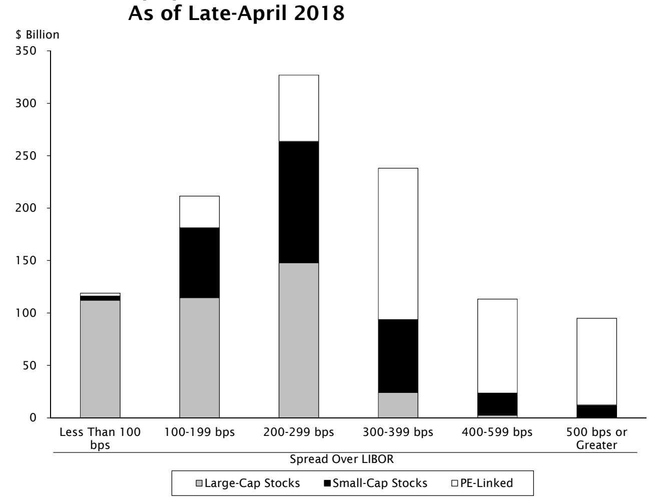
Exhibit 35: U.S. Stocks and Private Equity-Linked Firms
Aggregate Coupon Paid on Fixed-Rate Debt
Issued in the Past Year and Floating Rate Debt[1]
As of Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Dollar-weighted.

Exhibit 36: U.S. Stocks and Private Equity-Linked Firms
Aggregate LIBOR-Linked Floating-Rate Debt
by Spread[1]
As of Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Approximately 82% of all floating-rate debt is LIBOR-linked.

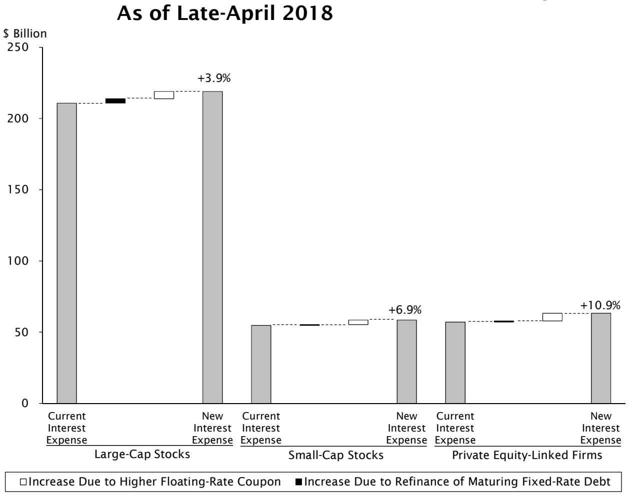
On the floating side, there's a wide range of spreads over LIBOR (see Exhibit 36 overleaf). Spreads under 100 basis points have almost exclusively been reserved for large, listed companies whereas anything over 300 basis points has been almost all private equity.

Combining all the moving parts, we can multiple the rate-sensitive portion of the debt burden by the marginal coupon rates that apply to fixed and floating components, plus some assumed rate increase, to get the overall increase in interest expense. For example, Exhibit 37 shows the increase in interest expense for a +100 basis point parallel shift in the yield curve (i.e., LIBOR goes up by +100 basis points, raising the cost of the floating-rate portion of debt commensurately, and the Ten-Year also goes up by +100 basis points, increasing the cost of refinancing the portion of fixed-rate debt due in the next two years).

The first thing that stands out is that the increases are pretty small in the grand scheme of things. In percentage terms total interest costs go up by +3.9%, +6.9%, and +10.9% for large-caps, small-caps, and private equity respectively. In dollar terms the increases are $8.2, $3.8, and $6.2 billion dollars of extra interest expense per annum. Is that enough to matter? In listed large-caps absolutely not. The top dotted line in Exhibit 38 shows the new EBIT interest coverage ratio, assuming a +100 basis point increase in rates and no change in EBIT; it would only fall from its current reading of 7.3x to 7.1x.

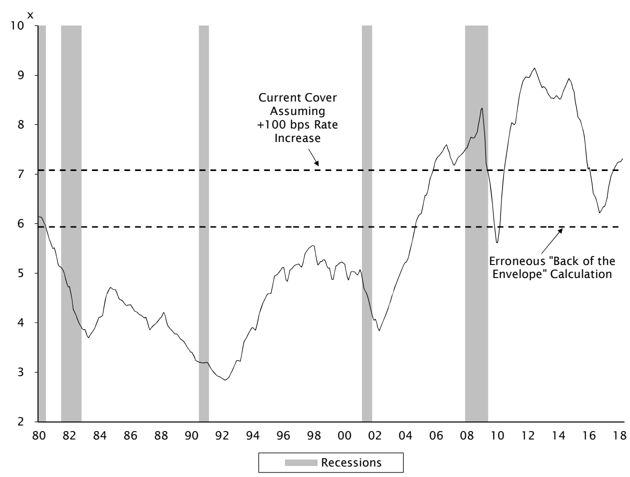
However, the lower dotted line shows what the ratio would look like if one erroneously assumed that the +100 basis point increase applied to the *entire* debt load $5 trillion. Then it might be enough to matter. But as we know from our analysis, about 80% of that $5 trillion is locked in at fixed coupon rates for more than two years. Nonetheless, the erroneous back-of-the-envelope number is perhaps why the high debt-to-equity ratio for the market continues to grab all the attention. As usual it takes some real work to get beyond the hyperventilating headlines.

Exhibit 37: U.S. Stocks and Private Equity-Linked Firms
Increase in Aggregate Interest Expense for a Hypothetical Parallel Shift in the Yield Curve of +100 bps
As of Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

Exhibit 38: Large-Capitalization Stocks (ex-Financials)
Interest Coverage Ratio[1]
1980 Through April 2018



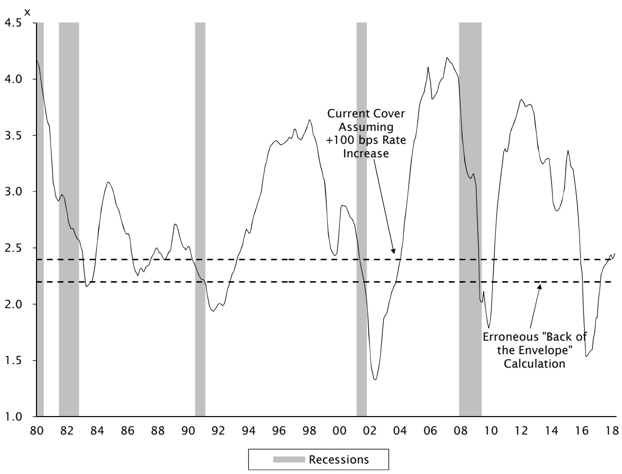
Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] EBIT interest cover, smoothed on a trailing three-month basis.

Turning to listed small-caps, the gap between the true impact of a +100 basis points increase in rates and the back-of-the-envelope number is less pronounced, because here almost half the outstanding debt *is* rate sensitive so it's only half-wrong (see Exhibit 39). Still, the overall impact of rising rates, correctly calculated, is fairly negligible. So while the debt burden for listed companies looks high on face value, the underlying structure of that debt means the portion exposed to higher rates isn't large enough to make much of a difference. As we've said many times, the *level* of rates matters more than their change and this is a prime example: locking in low rates for a long-time looks more like a sensible response to extraordinary times rather than overindulgence at the buffet table.

But it's a different story in private equity land. Because private companies don't have to publish financials it's hard to know what their interest coverage actually looks like. One way to guess at it is to take the average debt/EBITDA ratio that deals have been done at in the post-Crisis era (about 5.3x as per Exhibit 15) and use that to infer the aggregate EBITDA of the system. From there, if we assume the EBIT/EBITDA margin looks a bit like what we see in listed small-caps, we arrive at Exhibit 40. Our guestimate of the interest coverage ratio is about 1.6x, which is flirting with the 1.5x cutoff that's generally considered a warning threshold. If rates were to go up by +100 basis points one might cross below that threshold. Again, these numbers are crude but they do reaffirm that if there's going to be a problem, it's almost certainly going to an unlisted problem.

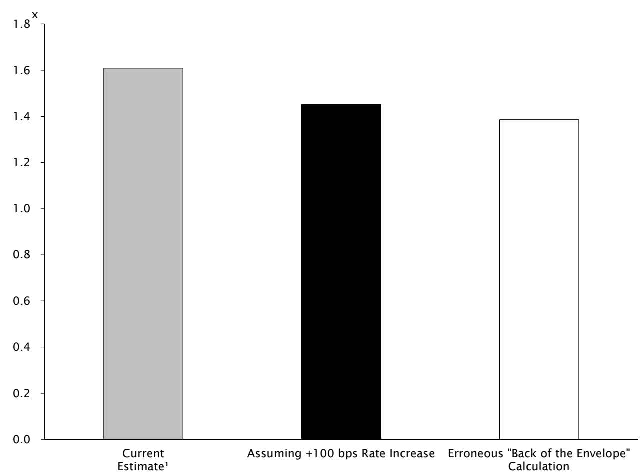
Exhibit 39: Small-Capitalization Stocks (ex-Financials)
Interest Coverage Ratio[1]
1980 Through April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] EBIT interest cover, smoothed on a trailing three-month basis.

Exhibit 40: Private Equity-Linked Firms
EBIT Interest Coverage Ratio Under Various Assumptions
As of Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

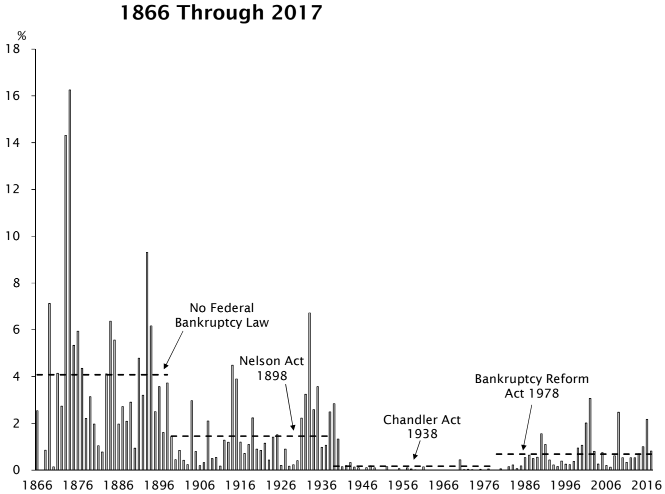
[1] Current estimate assumes a debt/EBITDA multiple of 5.3x, the average of the post-Crisis era for LBOs.

A Systemic Risk?

Let's assume that private equity debt does become a problem, in the sense that heavily-geared private companies start to default on their debt, perhaps triggered by a slowing top-line or disruption like we've seen with retail LBO targets. Would that threaten the whole economy? To answer that question we have to answer another question: who owns the debt? The reason that matters is because there's ample academic evidence that corporate bond defaults are much less likely to bring down the economy than bank loan defaults.

For example, a group of academics laboriously pieced together the annual corporate bond default rate in the U.S. over the past 150 years and used that data to identify 13 corporate default crises (see Exhibits 41 and 42).

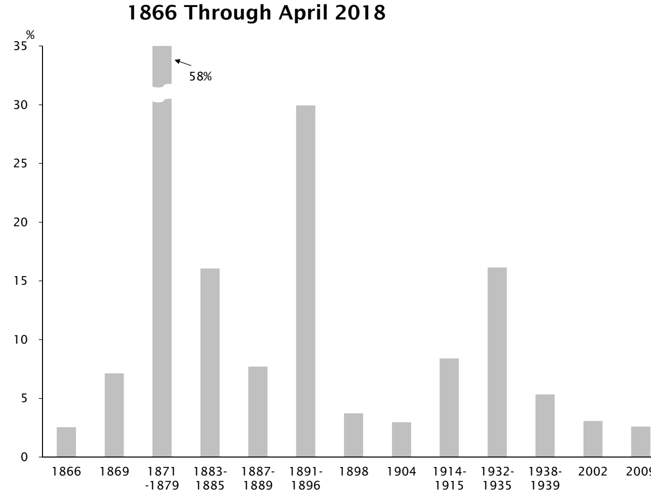
Exhibit 41: U.S. Non-Financial Corporate Bonds
Annual Default Rate[1]
1866 Through 2017



Source: Giesecke, K., Longstaff, F., Schaefer, S., and Ilya Strebulaev, 2014. "Macroeconomic Effects of Corporate Default Crisis: A Long-Term Perspective." *Journal of Financial Economics*, Vol. 111, Issue 1, pp. 297-310.

[1] Value-weighted data.

Exhibit 42: U.S. Corporate Default Crises[1]
Cumulative Default Rate Over Duration of Crisis
1866 Through April 2018

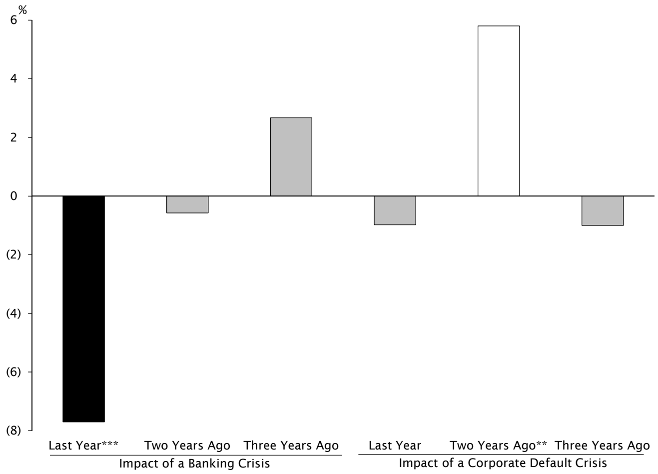


Source: Giesecke, K., Longstaff, F., Schaefer, S., and Ilya Strebulaev, 2014. "Macroeconomic Effects of Corporate Default Crises: A Long-Term Perspective." *Journal of Financial Economics*, Vol. 111, pp. 297-310.

[1] Crisis defined as a contiguous period during which the default rate exceeded 2.5%.

Armed with that data they were able to compare the impact a corporate bond default has on the economy compared to a banking crisis. First, they found that a recent banking crisis severely curtails bank loan growth in the following year, the black bar in Exhibit 43. But the white bar in the same chart shows that bank loan growth actually *increases* in second year after a corporate default crisis. In other words, a corporate default crisis crucially doesn't starve the economy of credit because of a substitution effect, i.e., borrowers who might have issued bonds just borrow from a bank instead. In contrast, growth in corporate bonds outstanding doesn't really get impacted by either type of crisis (see Exhibit 44).

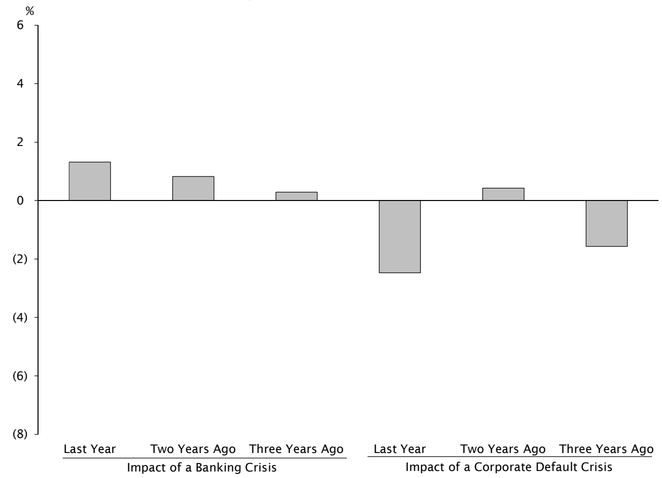
Exhibit 43: Bank Loans
Change in Annual Growth Rate Contingent on Past Banking or Corporate Default Crises 1900 Through 2008[1]



Source: Giesecke, K., Longstaff, F., Schaefer, S., and Ilya Strebulaev, 2014. "Macroeconomic Effects of Corporate Default Crises: A Long-Term Perspective." *Journal of Financial Economics*, Vol. 111, pp. 297-310.

[1] Excluding 1941-47 due to WWII.
*,**,*** Statistically significant at the 10%, 5%, and 1% level respectively.

Exhibit 44: Corporate Bonds Outstanding
Change in Annual Growth Rate Contingent on Past Banking or Corporate Default Crises 1900 Through 2008[1]

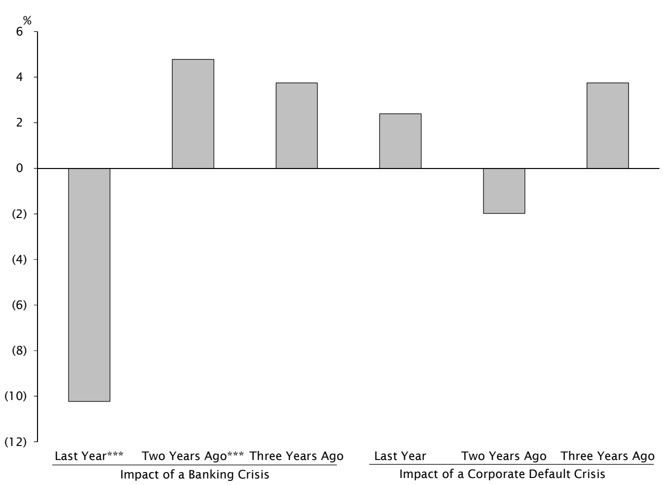


Source: Giesecke, K., Longstaff, F., Schaefer, S., and Ilya Strebulaev, 2014. "Macroeconomic Effects of Corporate Default Crises: A Long-Term Perspective." *Journal of Financial Economics*, Vol. 111, pp. 297-310.

[1] Excluding 1941-47 due to WWII.
*,**,*** Statistically significant at the 10%, 5%, and 1% level respectively.

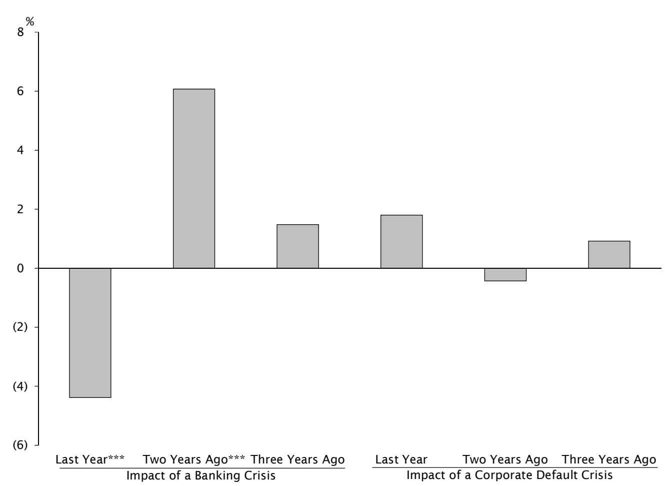
Next they looked at the impact each type of crisis has on the real economy. In a nutshell they found that industrial production and real per capita GDP decline significantly after a banking crisis (see Exhibits 45 and 46). In contrast, a corporate bond crisis has no widespread impact because the damage is limited to the owners of those bonds and credit to the system isn't choked off because banks keep lending.

Exhibit 45: Industrial Production
Change in Annual Growth Rate Contingent on Past Banking or Corporate Default Crises 1870 Through 2008



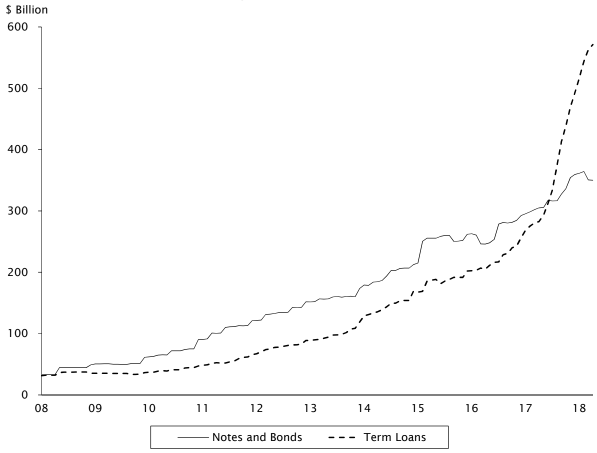
Source: Giesecke, K., Longstaff, F., Schaefer, S., and Ilya Strebulaev, 2014. "Macroeconomic Effects of Corporate Default Crises: A Long-Term Perspective." *Journal of Financial Economics*, Vol. 111, pp. 297-310.
*,**,*** Statistically significant at the 10%, 5%, and 1% level respectively.

Exhibit 46: Real Per Capita GDP
Change in Annual Growth Rate Contingent on Past Banking or Corporate Default Crises 1870 Through 2008



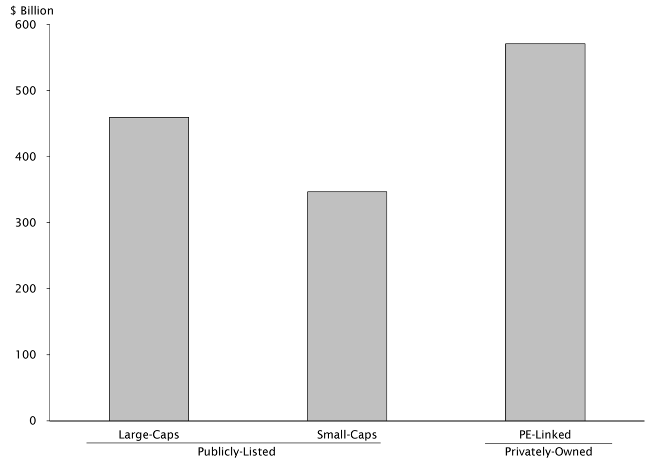
Source: Giesecke, K., Longstaff, F., Schaefer, S., and Ilya Strebulaev, 2014. "Macroeconomic Effects of Corporate Default Crises: A Long-Term Perspective." *Journal of Financial Economics*, Vol. 111, pp. 297-310.
*,**,*** Statistically significant at the 10%, 5%, and 1% level respectively.

Exhibit 47: Private Equity-Linked Firms
Total Debt by Type of Instrument
2008 Through Late-April 2018



Source: FactSet Research Systems, Empirical Research Partners Analysis.

Exhibit 48: U.S. Stocks and Private Equity-Linked Firms
Aggregate Term Loans
As of Late-April 2018

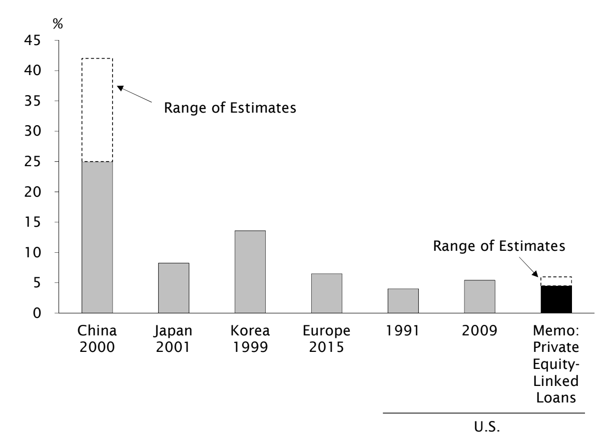


Source: FactSet Research Systems, Empirical Research Partners Analysis.

All of that makes understanding who owns the debt an important consideration and once again private equity is the problem child: over 60% of all debt is term loans, which are often issued by a consortium of banks (see Exhibit 47). In dollar terms the total value of loans backed by private equity-linked firms is the highest of any of the three cohorts we studied (see Exhibit 48). These days some of the loans are likely to be collateralized as CLOs and moved off bank balance sheets, but to size up the worst-case scenario let's assume that all $570 billion of the private equity-linked term loans are held in the banking system. Exhibit 49 shows the peak non-performing loan ratios for various other banking crises in history and the last bar shows the size of the private equity loans as a share of total bank credit for U.S. commercial banks. To approach the devastation of the 2009 financial crisis, or the 1991 one for that matter, we'd need to see close to a 100% default rate on these loans. That seems a little implausible but the numbers are big enough that even a lower default rate could be meaningful. It's definitely worth keeping a close eye on the private side of the fence because if there is a problem that's where it will emerge.

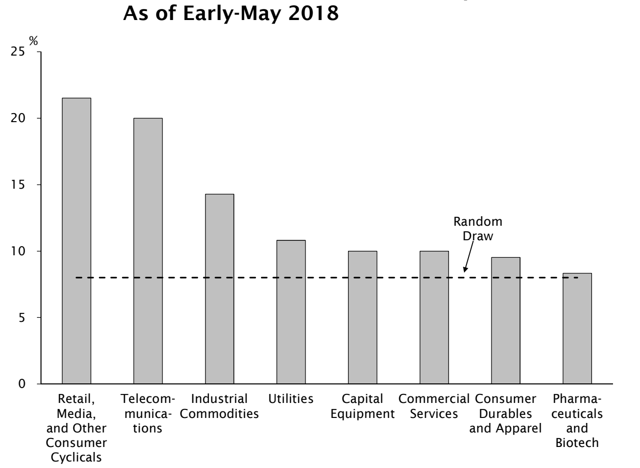
Meanwhile, for public equity investors the overall debt structure looks more benign than that for their private counterparts. But it's worth noting that a number of cyclical industries have a disproportionate share of stocks with top-quintile debt burdens *and* fundamental stability in the bottom two quintiles of the market (see Exhibit 50). While the impact of rising rates *in isolation* doesn't look threatening the bigger risk is that a bunch of cyclical businesses have bitten off more than they can chew. We're doing some follow-on work at the company level to identify where the risks lie but in the interim Appendix 1 on page 16 identifies large-cap stocks with big debt burdens that are particularly sensitive to rising rates and sorts them by their fundamental stability. Appendix 2 has the small-caps.

Exhibit 49: Select Banking Systems
Peak Non-Performing Loan Ratios
1991 Through Early-May 2018



Source: BIS, IMF, FDIC, European Central Bank, Empirical Research Partners Analysis.

Exhibit 50: Large-Capitalization Stocks
Share of Stocks in Each Sector that are in the Highest Quintile of Debt-to-Equity *and* the Worst Two Quintiles of Fundamental Stability
As of Early-May 2018



Source: Empirical Research Partners Analysis.

**Appendix 1: Large-Capitalization Stocks with Above-Average Debt-to-Equity Ratios and Share of Rate-Sensitive Debt[1]
Sorted by Share of Rate-Sensitive Debt, Fundamental Stability, and Capitalization within Sectors
As of Early-May-2018**

			Quintile Ranks (1=Best; 5=Worst)										
			Debt Metrics		Stability Metrics		Super Factors						
Symbol	Company	Price	Debt -to- Equity (5=Highest)	**Share of Rate-Sensitive Debt (5=Highest)**	**Fundamental Stability (5=Least-Stable)**	Beta (5=Highest)	Valuation	Capital Deployment	Earnings Quality and Trend	Market Reaction	Core Model Rank	YTD Returns	Market Capitalization ($ Billion)
Technology													
SYMC	SYMANTEC CORP	$27.92	4	**5**	**5**	1	3	1	2	5	2	(0.2) %	$17.4
FDC	FIRST DATA CORP	18.10	5	**5**	**5**	5	2	4	4	4	3	8.3	16.8
MELI	MERCADOLIBRE INC	333.25	4	**5**	**5**	5	5	4	4	4	5	5.9	14.7
GDDY	GODADDY INC	64.55	5	**5**	**5**	1	5	5	2	1	4	28.4	14.5
IT	GARTNER INC	120.66	5	**5**	**5**	4	4	5	5	5	5	(2.0)	11.0
NOW	SERVICENOW INC	165.50	4	**5**	**4**	3	5	4	5	1	3	26.9	29.2
WDC	WESTERN DIGITAL CORP	76.77	4	**5**	**4**	3	1	1	2	3	1	(2.9)	22.8
LDOS	LEIDOS HOLDINGS INC	62.04	4	**5**	**4**	5	2	5	3	3	3	(3.5)	9.4
WP	WORLDPAY INC	81.62	5	**5**	**3**	1	5	5	4	1	4	11.0	25.5
CTXS	CITRIX SYSTEMS INC	104.41	5	**5**	**3**	4	2	1	1	1	1	18.6	15.0
FLEX	FLEX LTD	13.70	4	**5**	**3**	2	2	2	4	5	3	(23.8)	7.2
CDW	CDW CORP	76.06	5	**5**	**2**	3	4	4	3	3	4	9.8	11.6
EBAY	EBAY INC	37.18	4	**4**	**5**	3	2	1	2	4	2	(1.5)	37.4
WDAY	WORKDAY INC	126.37	4	**4**	**5**	5	5	3	5	3	5	24.2	27.3
QCOM	QUALCOMM INC	50.26	4	**4**	**4**	5	2	1	2	5	1	(20.8)	74.5
TSS	TOTAL SYSTEM SERVICES INC	83.25	4	**4**	**3**	4	3	2	4	1	2	5.4	15.1
IBM	INTERNATIONAL BUSINESS MACHINES CORP	142.45	5	**4**	**1**	3	1	2	1	4	1	(6.2)	130.8
Retail, Media, and Other Consumer Cyclicals													
HLT	HILTON WORLDWIDE HOLDINGS	$79.45	5	**5**	**5**	4	5	4	2	1	2	(0.3) %	$25.2
MGM	MGM RESORTS INTERNATIONAL	31.22	5	**5**	**5**	5	3	2	2	5	3	(6.2)	17.4
LYV	LIVE NATION ENTERTAINMENT	40.11	5	**5**	**5**	3	3	2	5	4	4	(5.8)	8.4
CZR	CAESARS ENTERTAINMENT CORP	11.50	5	**5**	**5**	1	5	5	5	5	5	(9.1)	8.0
LVS	LAS VEGAS SANDS CORP	75.25	5	**5**	**4**	5	3	1	2	1	1	9.4	59.4
QSR	RESTAURANT BRANDS INTL INC	53.85	5	**5**	**4**	4	4	3	4	5	5	(11.7)	25.5
SERV	SERVICEMASTER GLOBAL HLDGS	53.34	5	**5**	**4**	3	4	5	2	3	4	4.0	7.2
ARMK	ARAMARK	36.97	5	**5**	**3**	2	2	5	4	5	5	(13.3)	9.1
BURL	BURLINGTON STORES INC	136.05	5	**5**	**2**	1	4	5	1	1	1	10.6	9.2
CHTR	CHARTER COMMUNICATIONS INC	274.78	5	**4**	**5**	4	2	3	5	5	5	(18.2)	65.3
LBTYK	LIBERTY GLOBAL PLC	28.32	5	**4**	**5**	5	1	1	5	5	2	(16.3)	23.6
FWONK	LIBERTY MEDIA FORMULA ONE	29.80	5	**4**	**5**	5	4	5	5	4	5	(12.8)	6.9
WYNN	WYNN RESORTS LTD	191.03	5	**4**	**4**	5	4	1	3	1	1	13.7	20.7
SCI	SERVICE CORP INTERNATIONAL	36.02	5	**4**	**3**	3	3	1	4	4	3	(3.1)	6.6
Capital Equipment													
AER	AERCAP HOLDINGS NV	$52.33	5	**5**	**5**	5	1	3	5	4	3	(0.5) %	$8.0
HDS	HD SUPPLY HOLDINGS INC	38.45	5	**5**	**5**	4	3	2	1	2	1	(3.9)	7.1
GDI	GARDNER DENVER HOLDINGS INC	31.40	4	**5**	**5**	5	5	3	3	1	2	(7.5)	6.2
ALLE	ALLEGION PLC	75.12	5	**5**	**4**	3	4	3	4	4	5	(5.3)	7.1
DE	DEERE & CO	134.75	5	**5**	**3**	2	4	2	4	4	4	(13.6)	43.6
NDSN	NORDSON CORP	127.25	4	**5**	**3**	4	4	4	5	4	5	(12.9)	7.4
UTX	UNITED TECHNOLOGIES CORP	118.50	4	**4**	**3**	3	3	5	5	3	5	(6.6)	94.8
HUBB	HUBBELL INC	102.88	4	**4**	**3**	3	3	4	5	5	5	(23.5)	5.6
MMM	3M CO	194.50	4	**4**	**2**	4	4	2	5	4	5	(16.9)	115.5
Consumer Staples													
USFD	US FOODS HOLDING CORP	$33.94	4	**5**	**4**	1	1	2	2	2	1	6.3 %	$5.2
PF	PINNACLE FOODS INC	59.18	4	**5**	**2**	1	4	2	4	3	4	0.1	7.0
GIS	GENERAL MILLS INC	42.49	5	**5**	**1**	2	1	1	1	5	1	(27.0)	25.2
SPB	SPECTRUM BRANDS HOLDINGS INC	73.95	5	**4**	**4**	2	1	4	3	5	4	(33.9)	4.3
KO	COCA-COLA CO	42.06	5	**4**	**1**	2	5	2	2	4	4	(7.5)	179.1
PEP	PEPSICO INC	97.23	5	**4**	**1**	2	3	2	2	4	3	(18.3)	138.0
MKC	MCCORMICK & CO INC	101.62	5	**4**	**1**	1	4	5	4	2	5	0.2	13.3
CHD	CHURCH & DWIGHT INC	45.87	4	**4**	**1**	1	4	2	3	4	4	(8.2)	11.4
PPC	PILGRIM'S PRIDE CORP	21.43	5	**4**	**1**	1	1	4	3	5	2	(31.0)	5.3
Health Care Equipment and Services													
HOLX	HOLOGIC INC	$39.64	4	**5**	**5**	2	5	2	3	5	5	(7.3) %	$11.0
DVA	DAVITA INC	63.38	5	**5**	**4**	3	1	3	2	4	2	(12.3)	11.6
EVHC	ENVISION HEALTHCARE CORP	37.65	4	**5**	**3**	1	1	5	4	5	3	8.9	4.6
ABT	ABBOTT LABORATORIES	57.85	4	**4**	**4**	5	4	2	5	3	4	2.3	101.0
CAH	CARDINAL HEALTH INC	64.65	4	**4**	**3**	3	1	2	4	5	2	6.3	20.4
ESRX	EXPRESS SCRIPTS HOLDING CO	74.05	4	**4**	**2**	3	1	1	2	3	1	(0.8)	41.6
Industrial Commodities													
AXTA	AXALTA COATING SYSTEMS LTD	$31.09	5	**5**	**5**	4	4	2	3	4	3	(3.9) %	$7.6
SEE	SEALED AIR CORP	43.71	5	**5**	**3**	4	5	3	1	4	4	(11.0)	7.4
BERY	BERRY GLOBAL GROUP INC	53.76	5	**5**	**3**	3	1	4	4	4	2	(8.4)	7.0
CC	CHEMOURS CO	48.47	5	**4**	**5**	5	3	3	2	3	2	(2.8)	8.9
RPM	RPM INTERNATIONAL INC	48.14	4	**4**	**4**	5	3	4	3	5	4	(7.0)	6.4
CE	CELANESE CORP	107.08	4	**4**	**3**	4	4	1	5	2	3	0.9	14.5
Utilities													
AES	AES CORP	$12.19	5	**4**	**5**	4	1	1	3	2	1	15.0 %	$8.1
SRE	SEMPRA ENERGY	111.16	5	**4**	**3**	1	4	5	3	4	5	4.8	29.3
SO	SOUTHERN CO	46.25	5	**4**	**2**	1	2	3	2	4	3	(2.6)	46.8
PEG	PUBLIC SERVICE ENTERPRISE GROUP INC	51.46	4	**4**	**2**	1	3	4	2	2	4	0.9	26.0
D	DOMINION ENERGY INC	66.19	5	**4**	**1**	1	3	5	3	4	5	(17.4)	44.5
LNT	ALLIANT ENERGY CORP	42.87	4	**4**	**1**	1	5	4	5	2	5	2.3	9.9
Commercial Services													
TRU	TRANSUNION	$65.71	4	**5**	**5**	2	5	4	3	1	2	19.6 %	$12.1
KAR	KAR AUCTION SERVICES INC	52.08	5	**5**	**4**	3	2	3	1	2	1	3.8	7.0
NLSN	NIELSEN HOLDINGS PLC	30.21	5	**5**	**3**	3	1	5	4	5	5	(16.2)	10.8
MCO	MOODY'S CORP	162.71	5	**4**	**4**	4	4	2	1	2	1	10.5	31.2
RSG	REPUBLIC SERVICES INC	64.37	4	**4**	**2**	1	2	3	2	4	2	(4.3)	21.4
Pharmaceuticals and Biotechnology													
IQV	IQVIA HOLDINGS INC	$96.91	4	**5**	**3**	1	3	5	5	3	5	(1.0) %	$20.2
MYL	MYLAN NV	36.77	4	**4**	**4**	4	1	4	3	4	2	(13.1)	19.3
ABBV	ABBVIE INC	100.37	5	**4**	**3**	5	3	2	1	1	1	5.6	159.8
GILD	GILEAD SCIENCES INC	66.88	5	**4**	**3**	4	1	1	3	4	1	(6.0)	87.2
Telecommunications													
S	SPRINT CORP	$5.17	4	**4**	**5**	1	1	1	4	5	3	(12.2) %	$20.7
CTL	CENTURYLINK INC	18.49	5	**4**	**5**	2	1	5	4	5	4	14.3	19.9
ZAYO	ZAYO GROUP HOLDINGS INC	35.65	5	**4**	**5**	1	5	4	3	2	3	(3.1)	8.8
Consumer Durables and Apparel													
HOG	HARLEY-DAVIDSON INC	$40.22	5	**5**	**3**	2	1	1	4	5	2	(20.3) %	$6.8
HBI	HANESBRANDS INC	17.28	5	**4**	**1**	2	1	1	3	5	2	(16.8)	6.2
Transports													
XPO	XPO LOGISTICS INC	$93.59	4	**4**	**5**	5	4	5	5	1	4	2.2 %	$11.3
UPS	UNITED PARCEL SERVICE INC	111.15	5	**4**	**2**	3	4	5	3	3	5	(5.9)	95.8

Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Rate-sensitive debt includes fixed-rate debt that matures within two years and all floating-date debt.

Appendix 2: Small-Capitalization Stocks with Above-Average Debt-to-Equity Ratios and Share of Rate-Sensitive Debt[1]
Sorted by Share of Rate-Sensitive Debt, Fundamental Stability, and Capitalization within Sectors
As of Early-May 2018

			Quintile Ranks (1=Best; 5=Worst)										
			Debt Metrics		Stability Metrics		Super Factors						
Symbol	Company	Price	Debt -to- Equity (5=Highest)	**Share of Rate- Sensitive Debt (5=Highest)**	**Fundamental Stability (5=Least- Stable)**	Beta (5=Highest)	Valuation	Capital Deployment	Earnings Quality and Trend	Market Reaction	Core Model Rank	YTD Returns	Market Capitalization ($ Million)
Technology													
GDDY	GODADDY INC	$64.55	5	**5**	**5**	2	5	5	2	1	3	28.4 %	$14,528
ZBRA	ZEBRA TECHNOLOGIES CP -CL A	133.12	5	**5**	**5**	4	3	3	1	2	2	28.2	7,103
CAVM	CAVIUM INC	75.13	4	**5**	**5**	4	5	4	2	3	4	(10.4)	5,248
PAY	VERIFONE SYSTEMS INC	22.83	4	**5**	**5**	5	4	3	3	2	4	28.9	2,528
MITL	MITEL NETWORKS CORP	11.16	5	**5**	**5**	5	4	5	5	2	5	35.6	1,353
WEB	WEB.COM GROUP INC	19.35	5	**5**	**5**	3	1	2	1	5	1	(11.2)	958
LSCC	LATTICE SEMICONDUCTOR CORP	5.40	5	**5**	**5**	4	3	1	2	5	3	(6.6)	671
BKI	BLACK KNIGHT INC	48.85	4	**5**	**4**	2	5	5	4	3	5	10.6	11,541
TDC	TERADATA CORP	40.81	4	**5**	**4**	4	3	1	2	2	1	6.1	4,975
MXL	MAXLINEAR INC	23.48	4	**5**	**4**	2	4	4	5	5	5	(11.1)	1,599
EXTR	EXTREME NETWORKS INC	10.80	5	**5**	**4**	5	4	5	5	2	5	(13.7)	1,245
XPER	XPERI CORPORATION	23.50	5	**5**	**4**	2	1	1	1	4	1	(2.8)	1,162
ICHR	ICHOR HOLDINGS LTD	22.21	4	**5**	**4**	5	2	5	4	2	2	(9.7)	584
CLGX	CORELOGIC INC	49.34	5	**5**	**3**	3	2	2	2	3	2	6.8	4,028
SAIC	SCIENCE APPLICATIONS INTL CP	84.81	5	**5**	**3**	4	2	3	2	1	2	11.6	3,647
SYNT	SYNTEL INC	28.90	5	**5**	**3**	3	2	1	1	1	1	25.7	2,398
EVTC	EVERTEC INC	19.75	5	**5**	**3**	3	2	3	2	3	2	44.7	1,430
UPLD	UPLAND SOFTWARE INC	27.64	4	**5**	**3**	1	5	4	5	3	5	27.6	595
BLKB	BLACKBAUD INC	97.35	4	**5**	**2**	2	3	4	1	3	2	3.1	4,724
MTSC	MTS SYSTEMS CORP	51.80	4	**5**	**2**	3	2	3	4	3	3	(3.0)	921
TCX	TUCOWS INC	62.20	5	**5**	**2**	2	3	5	2	3	4	(11.2)	659
SGH	SMART GLOBAL HOLDINGS INC	39.39	4	**5**	**1**	1	3	4	1	1	2	16.9	871
MSCC	MICROSEMI CORP	64.92	4	**4**	**5**	4	4	3	5	2	4	25.7	7,658
ARRS	ARRIS INTERNATIONAL PLC	26.47	4	**4**	**5**	4	2	2	5	4	2	3.0	4,903
GTT	GTT COMMUNICATIONS INC	49.35	5	**4**	**5**	3	4	5	5	1	4	5.1	2,211
MTSI	M/ACOM TECHNOLOGY SOLUTIONS	20.61	4	**4**	**5**	5	3	2	5	5	4	(36.7)	1,327
EIGI	ENDURANCE INTL GRP HLDGS INC	8.35	5	**4**	**5**	5	1	3	2	4	2	(0.6)	1,173
KEM	KEMET CORP	17.71	4	**4**	**5**	5	2	3	5	2	3	17.6	1,002
DBD	DIEBOLD NIXDORF INC	12.90	5	**4**	**5**	5	3	2	2	5	3	(20.6)	980
MODN	MODEL N INC	17.25	5	**4**	**5**	2	5	2	3	2	4	9.5	509
WEX	WEX INC	161.28	4	**4**	**4**	5	4	3	1	1	1	14.2	6,947
ACIW	ACI WORLDWIDE INC	23.03	4	**4**	**4**	3	3	4	2	4	3	1.6	2,697
BCOR	BLUCORA INC	26.05	4	**4**	**4**	1	3	5	2	3	4	17.9	1,222
CSIQ	CANADIAN SOLAR INC	15.48	4	**4**	**4**	5	1	2	4	5	2	(8.2)	907
SABR	SABRE CORP	23.28	5	**4**	**3**	2	2	2	1	3	1	14.3	6,419
BAH	BOOZ ALLEN HAMILTON HLDG CP	39.22	5	**4**	**3**	3	2	3	3	3	3	3.4	5,689
SWCH	SWITCH INC	14.41	5	**4**	**3**	1	4	5	2	5	5	(20.7)	3,640
EPAY	BOTTOMLINE TECHNOLOGIES INC	39.50	4	**4**	**3**	3	4	3	2	2	3	13.9	1,607
PSDO	PRESIDIO INC	15.09	4	**4**	**3**	3	2	4	2	3	3	(21.3)	1,398
FICO	FAIR ISAAC CORP	171.25	4	**4**	**2**	4	4	3	2	2	2	11.8	5,180
VSM	VERSUM MATERIALS INC	36.10	5	**4**	**2**	1	3	3	4	3	3	(4.5)	3,933
G	GENPACT LTD	31.67	4	**4**	**1**	2	3	1	4	3	2	0.0	6,107
CASA	CASA SYSTEMS INC	23.97	5	**4**	**1**	1	4	4	3	1	3	35.0	1,961
Capital Equipment													
HSC	HARSCO CORP	$22.40	5	**5**	**5**	5	4	3	3	1	2	20.1 %	$1,805
ATKR	ATKORE INTL GROUP INC	18.39	5	**5**	**5**	5	1	4	2	5	3	(14.3)	1,168
AEGN	AEGION CORP	22.81	4	**5**	**5**	5	1	1	1	4	1	(10.3)	743
DXPE	DXP ENTERPRISES INC	36.75	4	**5**	**5**	5	3	2	1	1	2	24.3	638
NNBR	NN INC	20.80	5	**5**	**5**	2	3	2	5	5	5	(24.4)	574
SPXC	SPX CORP	32.02	4	**5**	**4**	5	4	2	2	3	3	2.0	1,375
MCRN	MILACRON HOLDINGS CORP	17.89	5	**5**	**4**	2	3	1	1	3	2	(6.5)	1,246
WAIR	WESCO AIRCRAFT HOLDINGS INC	9.45	5	**5**	**4**	1	2	2	2	4	3	27.7	940
CIR	CIRCOR INTL INC	44.88	5	**5**	**4**	5	3	4	5	5	5	(7.8)	890
AWI	ARMSTRONG WORLD INDUSTRIES	57.10	5	**5**	**3**	5	4	3	1	2	3	(5.7)	3,013
SITE	SITEONE LANDSCAPE SUPPLY INC	71.44	5	**5**	**3**	4	5	5	4	1	4	(6.9)	2,866
GNRC	GENERAC HOLDINGS INC	45.35	5	**5**	**3**	5	2	3	1	2	1	(8.4)	2,829
AQUA	EVOQUA WATER TECH- REDH	19.78	5	**5**	**3**	1	4	4	2	4	5	(16.6)	2,240
MWA	MUELLER WATER PRODUCTS INC	9.80	4	**5**	**3**	4	3	2	1	5	3	(21.4)	1,556
CBPX	CONTINENTAL BUILDING PRODS	27.80	4	**5**	**3**	3	2	2	1	1	1	(1.2)	1,043
PLOW	DOUGLAS DYNAMICS INC	41.35	4	**5**	**3**	4	2	2	1	2	1	10.0	939
CMCO	COLUMBUS MCKINNON CORP	35.24	4	**5**	**3**	5	2	3	5	3	4	(11.8)	811
THR	THERMON GROUP HOLDINGS INC	22.80	4	**5**	**3**	3	4	4	4	2	4	(3.7)	740
PGTI	PGT INNOVATIONS INC	18.40	4	**5**	**2**	2	3	3	3	1	2	9.2	927
BRSS	GLOBAL BRASS & COPPER HLDGS	30.25	5	**5**	**2**	1	2	2	3	4	3	(8.4)	670
BWXT	BWX TECHNOLOGIES INC	66.52	5	**5**	**1**	1	5	5	5	2	5	10.2	6,628
GDI	GARDNER DENVER HOLDINGS INC	31.40	5	**4**	**5**	5	4	2	2	1	2	(7.5)	6,220
UNVR	UNIVAR INC	26.97	5	**4**	**5**	4	2	1	1	5	2	(12.9)	3,810
TGH	TEXTAINER GROUP HOLDINGS LTD	17.75	4	**4**	**5**	5	2	1	5	3	2	(17.4)	1,014
EGL	ENGILITY HOLDINGS INC	24.60	5	**4**	**5**	5	1	2	1	3	1	(13.3)	909
WBT	WELBILT INC	18.78	5	**4**	**4**	5	4	4	1	4	3	(20.1)	2,627
AJRD	AEROJET ROCKETDYNE HOLDINGS	26.09	5	**4**	**4**	3	3	1	1	2	1	(16.4)	1,971
GMS	GMS INC	31.05	4	**4**	**4**	4	2	4	5	4	4	(17.5)	1,274
NXEO	NEXEO SOLUTIONS INC	9.98	4	**4**	**4**	1	2	3	2	2	2	9.7	896
RXN	REXNORD CORP	27.32	4	**4**	**3**	5	2	1	2	2	2	5.0	2,841
STRL	STERLING CONSTRUCTION CO INC	11.48	4	**4**	**2**	1	2	2	3	5	4	(29.5)	311
TPIC	TPI COMPOSITES INC	22.98	4	**4**	**1**	1	3	3	3	3	3	12.3	784
Retail, Media, and Other Consumer Cyclicals													
LQ	LA QUINTA HOLDINGS INC	$19.25	5	**5**	**5**	5	4	4	2	2	3	4.3 %	$2,259
SEAS	SEAWORLD ENTERTAINMENT INC	16.40	5	**5**	**5**	2	2	3	4	4	4	20.9	1,452
BEL	BELMOND LTD	10.55	4	**5**	**5**	4	4	1	5	5	5	(13.9)	1,080
GDEN	GOLDEN ENTERTAINMENT INC	27.65	5	**5**	**5**	2	4	3	5	2	4	(15.3)	757
LTRPA	LIBERTY TRIPADVISOR HOLDINGS	9.30	4	**5**	**5**	4	1	2	3	5	2	(1.3)	701
CETV	CENTRAL EUROPEAN MEDIA	4.10	5	**5**	**5**	4	2	3	1	4	2	(11.8)	610
ASNA	ASCENA RETAIL GROUP INC	2.11	5	**5**	**5**	5	1	1	1	5	1	(10.2)	414
CWH	CAMPING WORLD HOLDINGS INC	26.91	5	**5**	**4**	5	4	5	5	5	5	(39.6)	2,362
LE	LANDS' END INC	19.75	5	**5**	**4**	1	2	2	1	1	1	1.0	635
LIND	LINDBLAD EXPEDITIONS HLDGS	10.95	5	**5**	**4**	2	4	1	4	3	4	11.8	501
EEX	EMERALD EXPSTNS EVENTS	19.26	4	**5**	**3**	3	3	5	4	4	5	(5.0)	1,402
PLYA	PLAYA HOTELS & RESORTS N.V	10.16	5	**5**	**3**	1	5	4	3	5	5	(5.8)	1,144
EVC	ENTRAVISION COMMUNICATIONS	4.50	4	**5**	**3**	4	1	3	1	5	1	(36.5)	407
BFAM	BRIGHT HORIZONS FAMILY SOLTN	96.50	5	**5**	**1**	1	4	3	2	2	3	2.7	5,652
PLAY	DAVE & BUSTER'S ENTMT INC	42.08	4	**5**	**1**	1	2	4	4	5	5	(23.7)	1,687
TRCO	TRIBUNE MEDIA CO	35.73	4	**4**	**5**	5	2	1	3	4	2	(15.4)	3,132
LAUR	LAUREATE EDUCATION INC	14.20	5	**4**	**5**	2	4	2	4	5	5	4.7	2,663
TRNC	TRONC INC	18.34	5	**4**	**5**	5	1	1	2	1	1	4.3	647
NYNY	EMPIRE RESORTS INC	19.25	5	**4**	**5**	5	5	5	5	4	5	(28.7)	631
SERV	SERVICEMASTER GLOBAL HLDGS	53.34	5	**4**	**4**	3	4	4	2	3	4	4.0	7,221
TSG	THE STARS GROUP INC	33.00	4	**4**	**4**	5	2	2	1	2	1	41.6	4,931
RRR	RED ROCK RESORTS INC	32.36	5	**4**	**4**	4	4	5	3	3	5	(3.8)	3,766
NXST	NEXSTAR MEDIA GROUP	$62.40	5	**4**	**4**	5	1	4	5	4	2	(19.8)	$2,868
PRTY	PARTY CITY HOLDCO INC	15.75	5	**4**	**4**	5	1	1	1	3	1	12.9	1,519
EYE	NATIONAL VISION HLDGS INC	33.64	4	**4**	**3**	4	4	5	3	3	5	(17.2)	2,528

Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Rate-sensitive debt includes fixed-rate debt that matures within two years and all floating-date debt.

Appendix 2 (cont.): Small-Capitalization Stocks with Above-Average Debt-to-Equity Ratios and Share of Rate-Sensitive Debt[1]
Sorted by Share of Rate-Sensitive Debt, Fundamental Stability, and Capitalization within Sectors
As of Early-May 2018

			Quintile Ranks (1=Best; 5=Worst)										
			Debt Metrics		Stability Metrics		Super Factors						
Symbol	Company	Price	Debt -to- Equity (5=Highest)	Share of Rate- Sensitive Debt (5=Highest)	Fundamental Stability (5=Least- Stable)	Beta (5=Highest)	Valuation	Capital Deployment	Earnings Quality and Trend	Market Reaction	Core Model Rank	YTD Returns	Market Capitalization ($ Million)
Retail, Media, and Other Consumer Cyclicals (cont.)													
ETM	ENTERCOM COMMUNICATIONS CORP	$10.20	4	4	3	3	4	5	5	3	5	(4.7) %	$1,466
HMHC	HOUGHTON MIFFLIN HARCOURT CO	6.95	4	4	3	2	2	1	2	5	2	(25.3)	858
BOOT	BOOT BARN HOLDINGS INC	19.73	4	4	3	4	2	3	4	1	2	18.8	535
BLMN	BLOOMIN' BRANDS INC	24.47	5	4	2	1	1	1	1	1	1	15.1	2,237
CABO	CABLE ONE INC	620.14	5	4	1	1	4	3	3	4	4	(11.6)	3,555
Industrial Commodities													
KS	KAPSTONE PAPER & PACKAGING	$34.28	4	5	4	5	2	3	4	1	1	51.5 %	$3,352
KMG	KMG CHEMICALS INC	62.49	4	5	2	1	4	5	4	2	4	(5.4)	969
PAH	PLATFORM SPECIALTY PRODUCTS	10.30	5	4	5	5	2	1	5	5	4	3.8	2,968
TROX	TRONOX LTD	17.32	5	4	5	5	3	1	1	4	2	(15.4)	2,121
OMN	OMNOVA SOLUTIONS INC	11.10	5	4	5	5	3	2	1	2	2	11.0	497
TSE	TRINSEO SA	73.60	5	4	4	5	2	1	3	3	2	2.3	3,194
MTX	MINERALS TECHNOLOGIES INC	68.45	4	4	4	5	2	2	2	4	2	(0.5)	2,422
PQG	PQ GROUP HOLDINGS INC	14.26	5	4	4	3	3	4	4	5	5	(13.3)	1,929
FOE	FERRO CORP	21.97	5	4	4	4	4	4	3	3	4	(6.9)	1,854
OEC	ORION ENGINEERED CARBONS SA	26.75	5	4	4	2	3	3	2	1	1	5.2	1,595
SHLM	SCHULMAN (A.) INC	42.70	5	4	4	4	3	2	3	1	2	15.8	1,261
RYAM	RAYONIER ADVANCED MATERIALS	20.72	5	4	4	5	1	2	5	2	1	1.7	1,074
FRTA	FORTERRA INC	7.17	5	4	4	3	1	1	2	1	1	(35.4)	461
GPK	GRAPHIC PACKAGING HOLDING CO	13.87	5	4	3	4	1	3	5	3	2	(9.8)	4,304
NGVT	INGEVITY CORP	76.83	5	4	3	3	4	3	4	2	3	9.0	3,243
GEF	GREIF INC -CL A	58.65	4	4	3	4	2	2	3	3	2	(2.4)	2,903
FUL	FULLER (H. B.) CO	49.64	5	4	3	4	3	2	4	4	4	(7.3)	2,509
CMP	COMPASS MINERALS INTL INC	69.40	5	4	3	2	3	2	1	3	2	(2.8)	2,348
ASIX	ADVANSIX INC	36.79	4	4	3	4	1	3	3	3	2	(12.6)	1,121
Health Care Equipment and Services													
RDNT	RADNET INC	$13.70	5	5	5	1	1	3	1	2	1	35.6 %	$661
DPLO	DIPLOMAT PHARMACY INC	22.15	4	5	4	4	3	5	5	1	4	10.4	1,641
VREX	VAREX IMAGING CORP	36.91	4	5	4	5	3	2	4	2	3	(8.1)	1,394
CIVI	CIVITAS SOLUTIONS INC	14.65	5	5	4	2	1	4	5	5	4	(14.3)	550
CRY	CRYOLIFE INC	23.10	4	5	3	2	5	5	5	2	5	20.6	846
MDSO	MEDIDATA SOLUTIONS INC	73.64	4	5	2	4	5	5	4	3	5	16.2	4,359
COTV	COTIVITI HOLDINGS INC	33.17	4	5	2	2	4	4	3	4	5	3.0	3,083
CPSI	COMPUTER PROGRAMS & SYSTEMS	30.10	4	5	2	1	3	4	2	4	4	0.5	424
QDEL	QUIDEL CORP	57.47	5	4	5	3	5	5	5	1	4	32.6	2,143
SGRY	SURGERY PARTNERS INC	16.90	5	4	5	5	1	1	5	4	1	39.7	827
LNTH	LANTHEUS HOLDINGS INC	18.70	5	4	5	4	3	4	5	3	5	(8.6)	708
MDRX	ALLSCRIPTS HEALTHCARE SOLTNS	11.71	4	4	4	4	2	5	3	4	4	(19.5)	2,118
AXGN	AXOGEN INC	39.20	4	4	4	1	5	5	5	1	5	38.5	1,360
BEAT	BIOTELEMETRY INC	40.10	4	4	4	2	5	5	5	1	5	34.1	1,312
HRC	HILL-ROM HOLDINGS INC	85.42	5	4	3	3	3	2	3	2	3	1.6	5,661
EVHC	ENVISION HEALTHCARE CORP	37.65	4	4	3	1	1	4	3	5	3	8.9	4,560
SEM	SELECT MEDICAL HOLDINGS CORP	18.80	5	4	3	4	2	4	1	3	2	6.5	2,521
ITGR	INTEGER HOLDINGS CORP	56.10	5	4	3	2	2	2	3	3	3	23.8	1,796
ACHC	ACADIA HEALTHCARE CO INC	38.79	4	4	2	2	1	3	3	4	2	18.9	3,424
Energy													
DK	DELEK US HOLDINGS INC	$48.32	4	5	5	4	3	5	4	1	2	39.0 %	$4,056
PVAC	PENN VIRGINIA CORP	46.98	4	5	5	4	3	5	5	4	5	20.1	707
GLNG	GOLAR LNG LTD	33.00	4	4	5	2	5	3	5	2	5	10.9	3,337
CZZ	COSAN LTD	9.89	5	4	5	5	1	1	2	2	1	2.0	2,405
FMSA	FAIRMOUNT SANTROL HOLDINGS	5.84	5	4	5	5	2	2	2	1	1	11.7	1,314
BRS	BRISTOW GROUP INC	16.75	4	4	5	5	2	2	1	2	1	24.4	593
GNRT	GENER8 MARITIME INC	5.84	4	4	5	3	2	1	1	4	1	(11.8)	486
SFL	SHIP FINANCE INTL LTD	14.30	4	4	4	4	2	1	4	3	2	(5.5)	1,696
GPRE	GREEN PLAINS INC	18.35	4	4	4	4	2	2	4	5	4	9.6	754
CEIX	CONSOL ENERGY INC	31.34	5	4	3	1	2	2	1	1	1	(20.7)	880
Pharmaceuticals and Biotechnology													
AKRX	AKORN INC	$12.55	4	5	4	5	1	4	4	5	3	(61.1) %	$1,572
LCI	LANNETT CO INC	15.65	5	5	4	5	1	2	1	5	1	(32.5)	592
PAHC	PHIBRO ANIMAL HEALTH CORP	42.35	5	5	2	3	4	2	3	3	3	26.7	1,702
TSRO	TESARO INC	50.94	5	4	5	4	5	4	3	5	5	(38.5)	2,792
DEPO	DEPOMED INC	6.28	5	4	5	4	1	1	4	5	1	(22.0)	399
CTLT	CATALENT INC	40.78	5	4	4	4	4	4	5	2	4	(0.7)	5,439
HALO	HALOZYME THERAPEUTICS INC	19.30	4	4	4	5	5	3	1	1	1	(4.7)	2,774
SYNH	SYNEOS HEALTH INC	39.85	4	4	3	2	3	5	5	5	5	(8.6)	4,162
PBH	PRESTIGE BRANDS HOLDINGS	28.64	5	4	3	4	1	5	4	5	3	(35.5)	1,519
Consumer Staples													
SFS	SMART & FINAL STORES INC	$5.30	5	5	4	3	2	3	1	5	3	(38.0) %	$393
TWNK	HOSTESS BRANDS INC	13.68	4	4	4	1	2	4	3	4	3	(7.6)	1,782
ELF	E.L.F. BEAUTY INC	18.99	4	4	4	3	5	5	1	4	5	(14.9)	901
TPB	TURNING POINT BRANDS INC	21.71	5	4	4	2	3	3	2	1	1	2.9	417
NOMD	NOMAD FOODS LTD	16.40	4	4	3	3	2	1	3	2	2	(3.0)	2,878
CHEF	CHEFS' WAREHOUSE INC	24.50	5	4	3	2	3	4	5	1	3	19.5	701
Consumer Durables and Apparel													
TOWR	TOWER INTERNATIONAL INC	$29.70	5	5	4	5	1	1	1	2	1	(2.4) %	$610
VSTO	VISTA OUTDOOR INC	13.95	4	4	5	1	1	3	2	5	2	(4.3)	801
MOD	MODINE MANUFACTURING CO	17.10	4	4	4	4	2	3	2	4	2	(15.3)	864
WWW	WOLVERINE WORLD WIDE	29.76	4	4	3	3	2	1	2	3	2	(6.4)	2,859
IBP	INSTALLED BLDG PRODUCTS INC	57.05	5	4	3	3	4	4	3	3	5	(24.9)	1,818
MCFT	MCBC HOLDINGS INC	25.53	5	4	3	4	4	4	3	1	3	14.9	477
Commercial Services													
TNET	TRINET GROUP INC	$52.23	5	5	4	5	3	3	1	1	1	17.8 %	$3,677
QUAD	QUAD/GRAPHICS INC	20.94	5	4	5	3	1	1	4	3	1	(6.3)	1,114
ADSW	ADVANCED DISPOSAL SERVICES	22.22	5	4	4	2	2	2	2	4	2	(7.2)	1,967
KAR	KAR AUCTION SERVICES INC	52.08	5	4	3	3	2	2	1	2	1	3.8	7,029
ECOL	US ECOLOGY INC	55.20	4	4	2	2	3	3	2	4	3	9.0	1,210
Transports													
DSKE	DASEKE INC	$8.66	4	4	5	4	2	4	5	5	5	(39.4) %	$495
MIC	MACQUARIE INFRASTRUCTURE CP	37.66	4	4	4	4	1	3	2	5	3	(39.1)	3,197
CMRE	COSTAMARE INC	6.99	4	4	4	5	1	4	2	4	2	24.9	763
ALGT	ALLEGIANT TRAVEL CO	160.15	5	4	1	1	2	5	4	1	2	3.9	2,587
YRIV	YANGTZE RIV PORT & LGSTC LTD	4.00	4	4	1	1	4	1	5	4	4	(54.6)	689
Utilities													
AY	ATLANTICA YIELD PLC	$19.83	5	4	5	3	1	1	1	2	1	(5.0) %	$1,987
CAFD	8POINT3 ENERGY PARTNERS LP	12.04	5	4	4	3	3	4	4	2	3	(19.0)	952
WGL	WGL HOLDINGS INC	85.84	5	4	2	2	4	3	1	3	5	1.2	4,409
PNM	PNM RESOURCES INC	38.95	5	4	2	1	2	2	5	3	3	(2.3)	3,103
Telecommunications													
SHEN	SHENANDOAH TELECOMMUN CO	$36.65	5	5	3	2	3	2	1	2	1	8.4 %	$1,815
CNSL	CONSOLIDATED COMM HLDGS INC	11.61	5	4	5	2	1	5	4	5	3	1.6	822
GSAT	GLOBALSTAR INC	0.62	5	4	5	5	5	3	2	5	5	(52.4)	787

Source: FactSet Research Systems, Empirical Research Partners Analysis.

[1] Rate-sensitive debt includes fixed-rate debt that matures within two years and all floating-date debt.