



DEFENSE

LK/LMT as a Case Study in Contractor R&D

- We looked at annual reports and other financial filings for Lockheed and Lockheed Martin from 1960-2013 as a case study in company funded R&D spending by a major defense contractor.
- Excluding estimated bid & proposal expense and the Tristar airliner, Lockheed/Lockheed Martin spent an average of 1.8% of sales on company funded R&D.
- Company-funded R&D spending did not appear to fluctuate with DoD RDT&E spending which was cyclical.
- The analysis doesn't include independent R&D expense, which is reimbursed by DoD as we don't have that data.
- Historic data suggests to us that it may be difficult for DoD to get defense primes to spend significantly more on R&D without creating more compelling threats of potential lost business to firms that are investing and taking more risk.

We recently had time to pull together Lockheed and Lockheed Martin Annual Reports since 1960. We don't mean to single out Lockheed/Lockheed Martin, but for now, of major defense contractors this is the most complete data set we have (we can get reports back to the 1920s, but that may be overkill). As well, it is now the largest defense contractor in the world and has been a leading defense contractor over the period we examined, so it's as good a starting place to examine industry behavior and data. We intend to look at other defense contractor long-term data series when we get complete sets of their annual reports.

One of the key themes we've been working with for defense stocks is that DoD has become far more vocal in the past year about eroding U.S. defense technology superiority and has been moving to do something about it. On Nov. 15, SecDef Hagel [formally unveiled](#) a technology offset strategy, though the DoD's Better Buying Power 3.0 acquisition policy guidance, which is still in draft form, strongly embraced innovation as well.

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This theme is important for investors to consider as they evaluate defense where it's an investment factor for equities and credits. It's important for three reasons:

- The focus on innovation can result in challenges to existing defense programs if new R&D efforts are started or current programs are found wanting against what appear to be faster evolving technologically sophisticated defense threats than were imagined prior to 2013.
- The idea that defense primes are simply cash generating machines could be up-ended, and current management incentives at firms that place heavy emphasis on free cash flow, earnings per share or other financial attributes may prove misaligned with new, emerging competitive dynamics.
- Effective research development and risk-taking may be more important for contractors to pursue. R&D expense is not the only way to access new innovation or invention as R&D can be acquired (by buying smaller firms) or tapped by teaming, joint venture and alliance.

We see this theme gaining traction in 2015 to the point where it could be actionable for investors. Certainly DoD will be talking about it a lot more. New leadership on the House and Senate Armed Services Committees may also drill down on this change too. Some companies have been discussing R&D and investment more openly. Harris routinely comments on its R&D expense in conference calls. Raytheon made a big deal in its October conference call of the pay-off from gallium nitride investment, and Exelis at its recent investor meeting noted an increase in 2015 C4ISR R&D expense (and at the same time announced a share buyback). We would expect to here more of this and believe that it may prove an important differentiator in 2015, particularly if sales and operating profit expectations start to diverge more within the sector.

Defense primes conduct research and development through contracted research and development, though DoD typically owns the results of those efforts. Primes can conduct independent research and development, which the DoD reimburses as an allowable cost. DoD is spending approximately \$4.5 billion on this, but spending by individual companies is not disclosed. Firms are able to retain the IP (intellectual property) from this R&D, though it should be aligned with DoD areas of interest. DoD is trying to get more insight into contractor IRAD (independent research and development) and has recently been meeting with its major contractors to that end. IRAD can impact contractor margins to the extent that it shows in an income statement as revenue and costs of goods sold, with no margin (think of it as a program with no margin akin to the LPD-17 program at Huntington Ingalls).

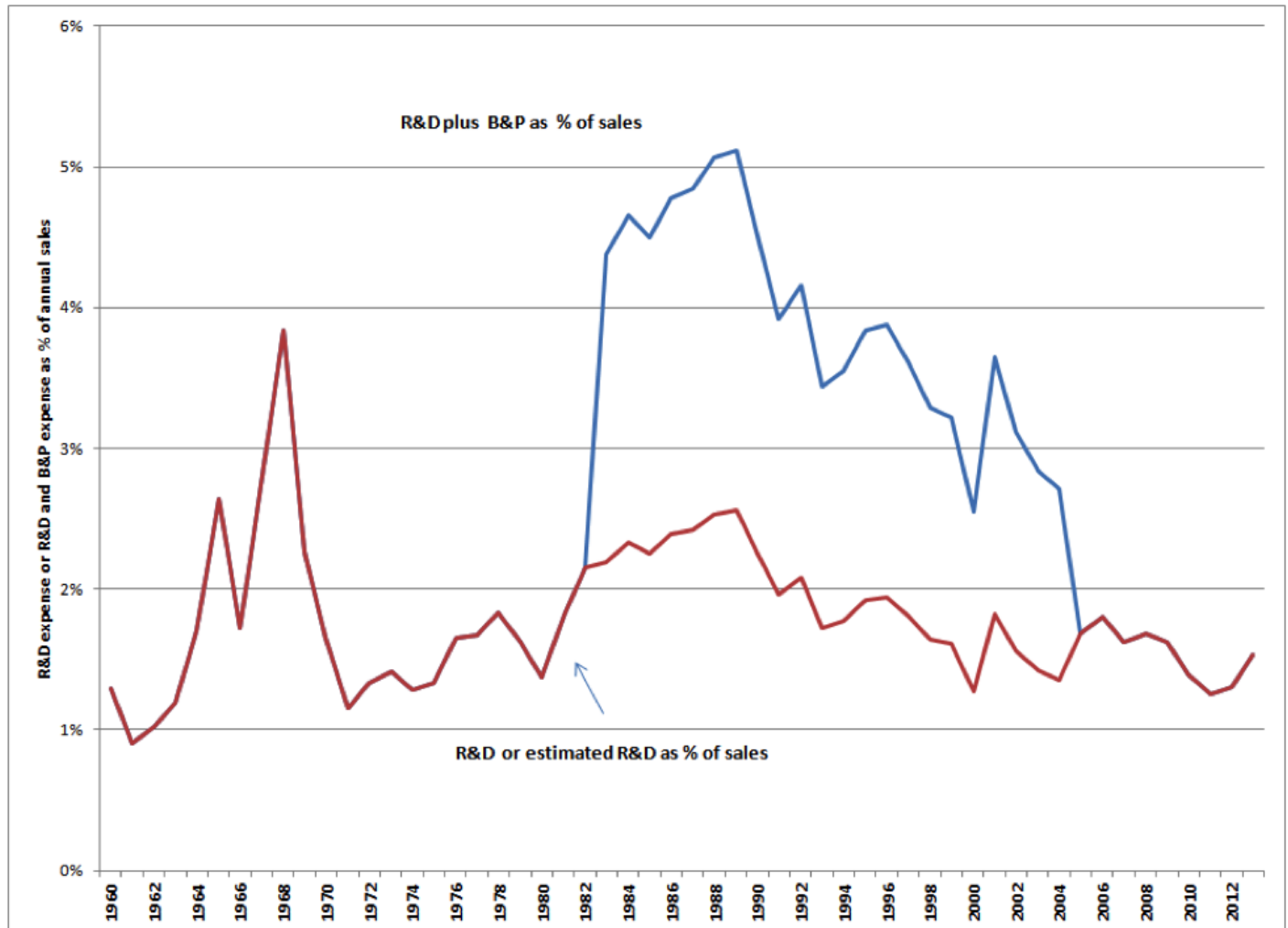
Company funded R&D is the focus of this note as that's what firms disclose in annual reports and SEC filings. This data is not pure or consistent and Lockheed/Lockheed Martin is a case in point:

- Some R&D may be related to commercial products and programs. In the case of Lockheed it did break out sales and operating profit or lose related to the Tristar commercial airliner program in the late 1960s-1970s. However, company funded R&D may also include commercial satellites or other non-defense products.
- In some years, Lockheed and Lockheed Martin showed company-funded R&D only, but from 1983-2008 it reported R&D and bid and proposal expenses. In some years it reported both and in those years, the two seemed generally evenly matched. We suppose the logic with reported B&P was that pursuing new programs imparted knowledge to the company that it might be able to use in its business.



The data shown excludes the Tristar commercial airliner program and is as reported each year. We did not try to restate prior year financials for acquisitions or divestitures.

Exhibit 1. Lockheed, Lockheed Martin Company Funded R&D Metrics



Source: Capital Alpha Partners, annual reports

Exhibit 1 shows that Lockheed's R&D expense surged as a percent of sales in the mid-1960s. This may be attributed to a number of major new program pursuits in aircraft, helicopters and missiles. We showed the B&P plus R&D figure that Lockheed/ Lockheed Martin reported in 1983-2008, but then cut that in half as a SWAG to show only its R&D expense.

- Company-sponsored R&D expense has generally been in the 1%-2% of sales range.
- The lows of R&D spending as a percent of sales were in 1971-72 (when the company was in financial difficulty)

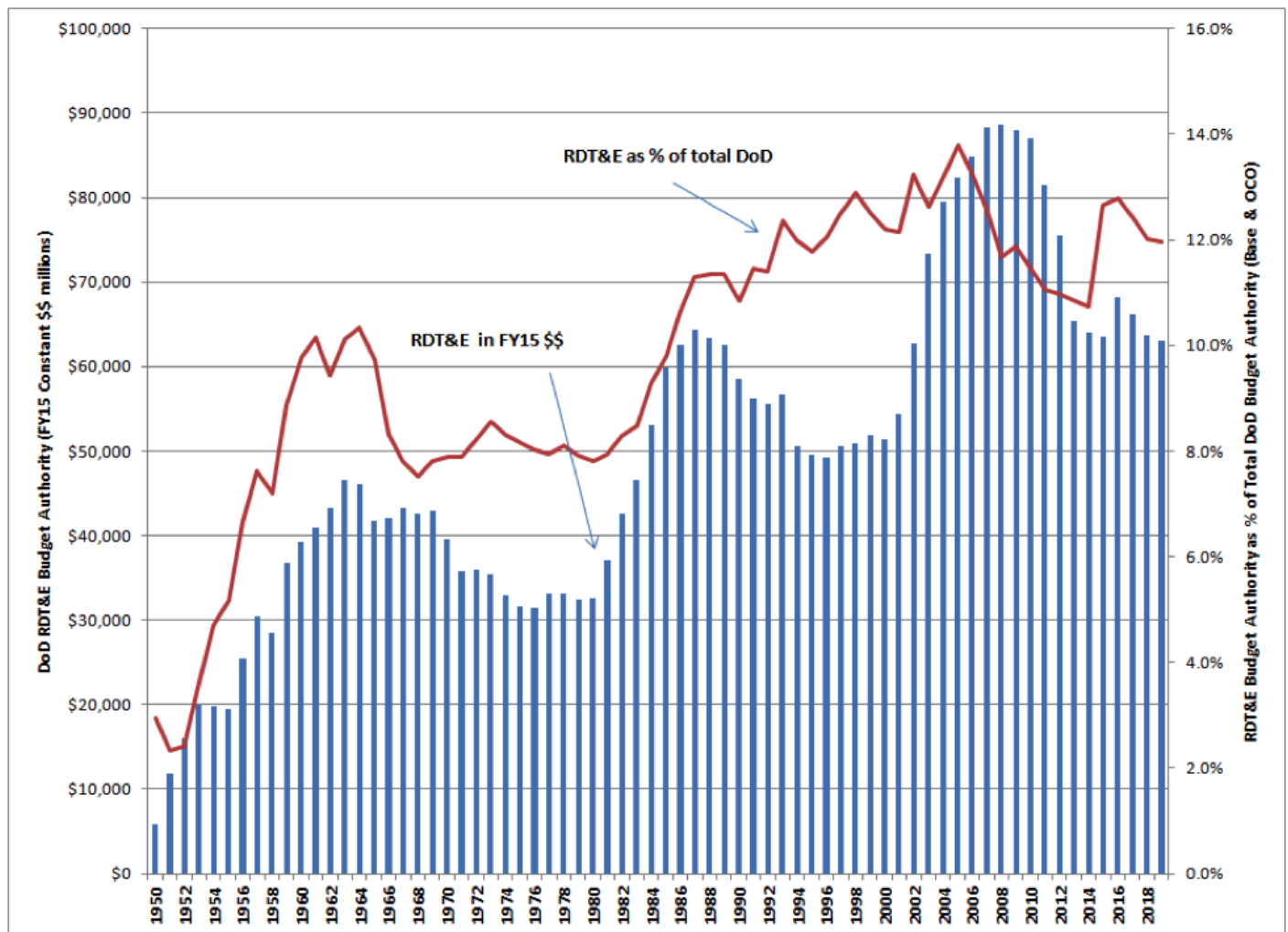


and again in 2000 and 2003-2004.

- R&D expense rose slightly in 2013 and is slated to increase a bit more in 2014, but at 1.5% of sales remains below an estimated 1960-2013 average of 1.8%.

We were curious if there was cyclicality to R&D spending that may align with DoD RDT&E (research, development, test & evaluation) spending. Exhibit 2 shows DoD RDT&E budget authority in FY50 through the plan for FY19 in FY15 constant dollars and as a percentage of total DoD budget (base and overseas contingency operations).

Exhibit 2. RDT&E Cycles for DoD



Source: Capital Alpha Partners, Department of Defense

- As a % of total DoD spending, RDT&E rose significantly in the mid-late 1950s which was an era when it pursued an earlier “technology offset” strategy by investing in smaller and/or more powerful nuclear weapons, continental air defense, strategic bombers and intercontinental ballistic missiles. Interestingly, though, it was

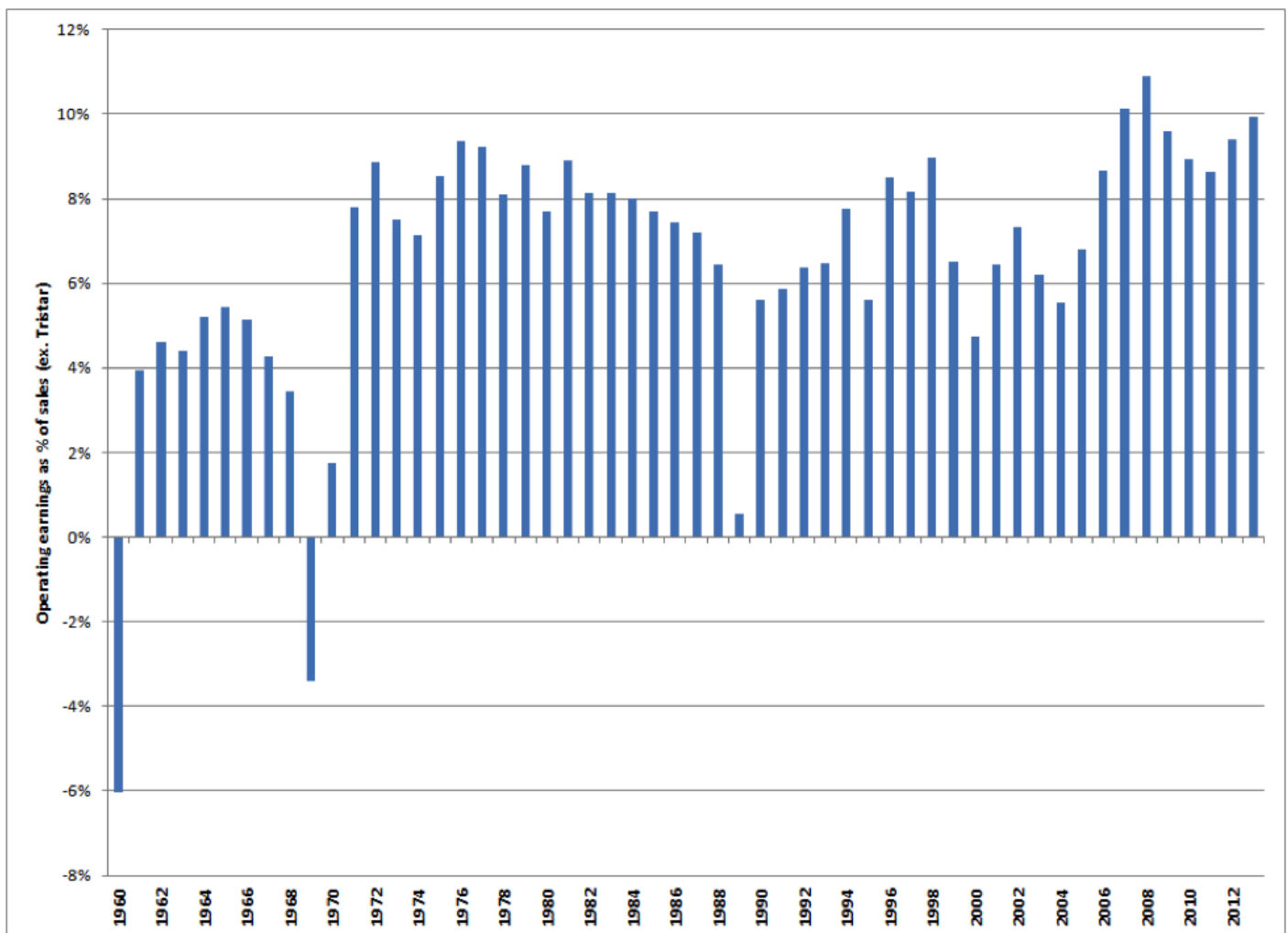


fairly constant in the 1970s when another set of technologies were pursued as part of an offset strategy (GPS, stealth, precision weapons).

- In constant dollars, the stock analyst in us can't help noticing that old highs became new lows. So, the highs in RDT&E spending in the 1960s saw a drop in the 1970s, but the 1990s' lows never fell below 1960s levels. The similar pattern emerges for the 2012-19 period, compared to the 1980's highs.

A final thought before moving to conclusions is whether there are other metrics to consider. Sales is one metric and as noted, on this basis, at least one defense prime's allocation of company funded R&D has been fairly consistent over many, many years. But another is to consider operating earnings. We've shown program profits and/or operating earnings (excluding Tristar) as a percentage of sales in Exhibit 3.

Exhibit 3. Lockheed, Lockheed Martin's Operating Margin 1960-2013



Source: Capital Alpha Partners, annual reports



The data shows some years when Lockheed reported operating losses. The 1960 loss was due to the Electra aircraft program and 1969 was due to C-5A and other defense programs. The negligible profit in 1989 resulted from a charge on the P-7 maritime surveillance aircraft. Recent operating margins are at historically high levels and margin in 2014-16 should be similar or higher on mix shift in Aeronautics. A point here is that margin may not have improved as a result of R&D expense reduction (though we don't know how lower IRAD or P&P expense could have affected margin).

What's all this mean?

- Exhibit 2 suggests that much as DoD is now talking about a new technology offset strategy, it very much remains to be seen whether RDT&E will increase significantly above the current plan or even into next decade. DoD still has significant recapitalization needs in naval vessels and combat aircraft.
- The most recent upcycle in RDT&E spending didn't appear to result in a new set of breakthrough defense technologies akin to 1950s. That said, RD&TE was fairly flat in the 1970s in constant dollars when the last offset strategy was pursued. That might provide optimism that outsized returns could be gained from focused and efficient investments in the next 2-5 years.
- We continue to wonder how willing defense primes will be to reduce reported operating margins in 2015-18 through stepped up IRAD or company-funded efforts. The data in Exhibit 1 show that at, least as far as one contractor is concerned, company funded R&D has shown some variability. With the possible exception of the mid-1960s, it's hard to see a "golden era" where at least one defense prime was expensing significantly higher R&D to support DoD needs.
- We also continue to wonder how relatively low defense R&D expense as a percent of sales will be able to keep pace with the funds commercial firms are spending on technologies that have defense applications. In the 2017-19 time period, that may prove to be one of the more important factors that challenges current consensus views on defense.

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