BEHIND THE NUMBERS
EARNINGS QUALITY & DIVIDEND SUSTAINABILITY RESEARCH

BTN Research

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Current EQ Rating*	Previous EQ Rating
3-	na

6- "Exceptionally Strong"
5- "Strong"
4- "Acceptable"
3- "Minor Concern"
2- "Weak"
1- "Strong Concerns"

Note that a "+" sign indicates the earnings quality improved in the most recent quarter while a "–" sign indicates deterioration

*For a more detailed explanation of the EQ Review Rating scale, please refer to the end of this report

We initiate earnings quality coverage of TransDigm (TDG) with an EQ rating of 3- (Minor Concern)

The company serves the aerospace market for commercial airplanes, business planes, and defense programs with both OEM and replacement parts. TDG focuses on increasing miles flown worldwide as providing steady growth for maintenance on existing plane fleets. It augments this steady growth with acquisitions – 66 and counting so far. The focus is on

finding niche and proprietary parts that can be sold to the maintenance markets for decades such as serving the existing fleet of Boeing 777s or Blackhawk helicopters. While there is some lumpiness to sales for individual platforms, TDG believes it essentially has locked up decades of future sales of replacement parts – giving it almost a utility or pipeline type of steadiness in revenues and cash flow that grows with the number of miles flown increasing.

Results have consistently beaten EPS forecasts and the company sells for 27x next year's earnings, despite organic growth in the low single-digits. We have a few issues with the company's strategy in terms of sustainability. The goal is to not only grow sales with acquisitions, but also boost margins for acquired firms and grow EBITDA faster than sales. The company missed on revenue in 4Q and guided down on EPS growth and revenue growth for 2020.

- Without acquisitions, organic growth is 2%-3%. The surge in defense spending that drove last year has stabilized and returned to lower rates. We also see some rising costs in places like R&D, stock compensation, and the lower margin Esterline deal reducing total growth.

- Department of Defense is looking at pricing. There is little information from TDG about the make-up of pricing and volume for sales. The nature of the business should allow it to boost pricing and produce organic growth. Now, it is being audited by the US Government for issues relating to pricing. There are other inquiries ongoing too. This could be a sizeable issue given it has over 5x EBITDA in debt.

- Auditors called out a critical audit matter related to a loss reserve set up for lower-margin contracts acquired with Esterline. The reserve will be amortized over time as an offset to cost of goods sold and boost gross margin.

- We do not consider several other acquisition-related matters one-time or even non-cash – yet TDG is adding back these on-going costs to adjusted figures. Without these adjustments, margins gains are more subdued. They added over 520bp to margins last year.

- The Esterline deal shows a change in standard policy. It was the largest deal the company has made. Unlike many prior deals, it was not owned by a private equity group who was pruning costs. When sold to TDG, the prior deals could benefit by eliminating the management costs quickly and produce results. Esterline will be a

larger integration and require larges changes to the operations. That is not to say it cannot work – just that it adds more questions.

- Large figures for intangible assets are an issue in our view. Only about 20% of the assets are being expensed, and then at rates of 20-years or more. Yet, R&D and equipment developed in-house are expensed immediately or at most 10-years. We question how Customer Relationships are being capitalized as it seems likely TDG would already have been doing business with many of the same customers.

- ROI on TDG's reported results is about 15%, which would seem to point to little risk of impairment – the government audit notwithstanding. However, that 15% is about 400bp higher by not expensing the full cost of acquisitions. It another 500bp higher by having a huge negative equity figure due to dividends reducing the capital figure and using a 20-year amortization for what is being expensed instead of 10-years like other assets at TDG.

- Debt levels are high and terms require the company to prepay some debt with excess cash flow. That would indicate that the $900 million in free cash flow is not fully available for dividends and acquisitions.

Without Acquisitions – We Doubt the Underlying Growth Is Enough

Organic growth is normally low single-digit. That has been boosted in the last two years with a surge in defense-related sales.

	2019	2018	2017	2016	2015
Total Organic Growth	$401.6	$191.6	$77.2	$55.1	$78.0
Growth rate	10.5%	5.5%	2.4%	2.0%	3.3%
Defense Organic Growth	$180.4	$60.5	$40.7	-$1.0	$22.0
Commercial Aftermarket	$105.5	$109.6	$34.8	$56.0	$39.0
Commercial OEM	$114.3	$44.8	-$4.3	-$11.8	$16.0

With acquisitions, sales growth is obviously much higher:

	2019	2018	2017	2016	2015
Total Sales Growth	$1,412.1	$306.8	$332.9	$464.3	$334.2
Growth rate	37.1%	8.8%	10.5%	17.2%	14.1%

The company's model is that it can improve margins of acquired businesses and throw off sizeable cash flow to pay for deals:

	2019	2018	2017	2016	2015
Adj EBITDA Margin	46.3%	49.2%	48.8%	47.1%	45.6%
Adj EBITDA Growth	28.9%	9.7%	14.4%	21.2%	15.0%
Cash from Operations	$1,015.5	$1,022.2	$788.7	$683.3	$520.9
Capital Spending	$101.6	$73.3	$71.0	$44.0	$54.9
Free Cash Flow	$913.9	$948.9	$717.7	$639.3	$466.0
Acquisitions	$3,976.2	$667.6	$216.0	$1,399.1	$1,624.3
Dividends	$1,712.2	$56.1	$2,581.6	$3.0	$3.4

The latest deal for Esterline came with lower margins and was a sizeable acquisition and that accounts for the lower EBITDA margin in 2019 vs. 2018. TDG has been able to grow EBITDA faster than organic sales as it reduces some overhead at acquisitions. It is now producing over $900 million in free cash flow. However, it is still not covering its acquisition costs, which is being covered with borrowing.

Also, the defense business which produced so much growth of late, is falling back to more subdued growth. According to Kevin Stein the president of TDG on the November call, "*We had a strong bookings year in defense, not as strong as the year before, but our total defense bookings were up in that mid-single-digit range.*"

While we're looking at margins, we think R&D also deserves a quick look. The Esterline deal at $2 billion in sales was spending over 5% of sales on R&D. TDG has been spending less in absolute dollars and percentage of sales. This may be something that needs to rise going forward and could hinder margin expansion:

R&D	2019	2018	2017	2016	2015
TDG R&D	$116.8	$73.8	$73.8	$58.6	$48.3
TDG R&D % Sales	224bp	194bp	211bp	185bp	178bp
Esterline R&D			$109.8	$99.7	$100.8
Ester R&D % Sales			549bp	500bp	503bp

Some Problems Are Developing – Department of Defense Looking at Pricing

The company's discussion of sales and gross margin gives little if any focus on price increases vs. volume changes. For example, here is 2019's MD&A text on sales results:

> *"The increase in organic sales for the fiscal year ended September 30, 2019 compared with fiscal year ended September 30, 2018, is primarily related to an increase in defense sales ($180.8 million, an increase of 13.6%), commercial OEM sales ($115.1 million, an increase of 11.9%) and commercial aftermarket sales ($105.5 million, an increase of 7.9%). Acquisition sales represent sales of acquired businesses for the period up to one year subsequent to their respective acquisition dates. The amount of acquisition sales displayed in the table above for the fiscal year ended September 30, 2019 are attributable to the acquisitions of Esterline (March 2019), Skandia (July 2018), Extant (April 2018) and Kirkhill (March 2018)."*

The gross margin discussion in MD&A is not much better as the company notes that the rise in the cost of sales is due to higher sales both organic and acquisition-related.

One of the concerns centers on TDG's focus to buy specialized niche products in acquisitions that are proprietary and then boost prices on them. While others could conceivably build a similar part and even customers like Boeing and Airbus may do a make-or-buy decision; TDG should have some pricing power simply being the entrenched provider of the part with certification and testing already in place. Also, if an airline spent $1 billion on several airplanes with an expected life of 20-25 years – are they going to replace those planes if a maintenance replacement part costs $5,000 when it used to cost $4,500? Also, unlike cars where there are hundreds of millions of units on the road and can sustain multiple part suppliers – TDG believes it serves a fleet of about 100,000 aircraft.

The only evidence we see of some of the pricing issues is from this year. The Inspector General of the Department of Defense is auditing TDG:

> *"Furthermore, even where the price is not based on cost, the U.S. Government may seek to review our costs to determine whether our pricing is "fair and reasonable." Our subsidiaries are periodically subject to pricing reviews and government buying agencies that purchase some of our subsidiaries' products are periodically subject to audits by the DOD Office of Inspector General ("OIG") with respect to prices paid for such products.* ***In the third quarter of fiscal 2019, we voluntarily refunded $16 million***

> ***to the U.S. government following an OIG audit, and another OIG audit is underway. In addition, our defense-related business is the subject of an ongoing Congressional inquiry by the House Oversight Committee.*** *Pricing reviews and government audits, including the audit underway, and the Congressional inquiry are costly and time consuming for our management and could distract from our ability to effectively manage the business. As a result of these reviews, audits and inquiries, we could be subject to providing further refunds to the U.S. Government or we could be asked to enter into an arrangement whereby our prices would be based on cost, the DOD could seek to pursue alternative sources of supply for our parts, or the U.S. government could take other adverse actions with respect to our contracts. Any of those occurrences could lead to a reduction in our revenue from, or the profitability of certain of our supply arrangements with, certain agencies and buying organizations of the U.S. Government.*
>
> *If a government inquiry or investigation uncovers improper or illegal activities, we could be subject to civil or criminal penalties or administrative sanctions, including contract termination, fines, forfeiture of fees, suspension of payment and suspension or debarment from doing business with U.S. government agencies, any of which could materially adversely affect our reputation, business, financial condition and results of operations."*

Defense work was 30% of TDG sales in 2019. If pricing is reduced, it could impact sales and margins quickly. On the conference call in November, president Kevin Stein added:

> *"The IG, that is an audit of the DLA and its buying practices of TransDigm-related products. We continue to work closely with the IG. I really don't have an estimate yet of when that will complete, but we're actively engaged and working through. It appears to be a similar scope as prior audits. That's really all I have to update right now, but we are working closely with them.*
>
> *On the pricing memo, we have met with the DoD directly on this. The pricing memo was put out to hopefully clarify the situation.* ***We're seeing some additional, we would say, pickiness on pricing or costs or different requests for information.****"*

The Auditors Are Looking More Closely at Some of the Esterline Accounting

When TDG bought Esterline in 2019, it determined that some of the contracts for orders were unfavorable. It booked a $268.4 million loss reserve against these contracts. It will then amortize the reserve into income as an offset to cost of goods sold over time.

We have two basic problems with this. The charge is considered one-time and is added back to results and ignored as though it never happened. However, as this is amortized over time into income, it has the effect of raising the gross margin as it lowers cost of goods sold. It also represents a non-cash source of income. This is not the first time TDG has had this type of amortization. From the cash flow statement, we know it helped results in 2017-19 already:

	2019	2018	2017
Amortiz. Loss Contracts Reserves	$38.3	$10.6	$3.5
Margin gain	73bp	28bp	10bp

The size of the reserve created what Ernst & Young called a Critical Audit Matter in its opinion audit:

> *"Management's accounting for the Company's 2019 acquisition of Esterline was significant to our audit because the amounts are material to the consolidated financial statements and the related accounting for this transaction involved a high degree of subjectivity in determination of the fair value of the $1,310 million acquired intangible assets, and $268 million loss contract reserves.* ***The acquired intangible assets principally consisted of trademarks and tradenames, technology, order backlog, and customer relationships. The loss contract reserves related to acquired contracts with customers that were determined to have below market terms. The high degree of subjectivity was primarily due to the sensitivity of the respective fair values to underlying assumptions about the future performance of the acquired business****. The Company used a discounted cash flow model to measure the intangible assets and loss contract reserves. The significant assumptions used to estimate the value of the intangible assets included discount rates and certain assumptions that form the basis of the forecasted results (e.g., revenue growth rates, customer attrition rates, and royalty rates*_**). The significant assumptions used to estimate the value of the loss contract reserves included discount rates, forecasted quantities of the products to be sold under the long-term contracts and market prices for respective products. These**_

<u>significant assumptions are forward looking and could be affected by future economic and market conditions."</u>

Other "One-Time" Acquisition Accounting Techniques are Helping Margins Too

A quick look at adjustments that TDG makes to earnings and EBITDA shows several standard types of accounts investors would expect to see. We have problems with these adjustments given that they occur every year. Moreover, with the company viewing acquisitions as a key part of its business model – they should be expected to continue. These simply are not one-time in nature nor are they out of the realm of normal activity for TDG. In many cases, these charges also consume cash, and adding them back removes some of the ongoing cash costs of doing acquisitions. Keep in mind Adjusted EPS was $18.27 in 2019.

	2019	2018	2017	2016	2015
EBITDA	$2,148.3	$1,778.4	$1,581.0	$1,373.6	$1,149.3
EBITDA Margin	41.1%	46.6%	45.1%	43.3%	42.5%
Inv. Adjustment	$76.9	$7.1	$20.6	$23.4	$11.4
Acq. Integration	$61.4	$17.5	$6.3	$18.5	$12.6
Acq. Transaction	$30.5	$3.9	$4.2	$15.7	$12.3
Stock Comp.	$93.4	$58.5	$45.5	$48.3	$31.5
Refinancing Cost	$3.0	$6.4	$39.8	$15.8	$18.4
Other	$5.2	$4.8	$13.0	-$0.2	-$1.7
Adj. EBITDA	$2,418.8	$1,876.6	$1,710.6	$1,495.2	$1,233.7
Adj. EBITDA Margin	46.3%	49.2%	48.8%	47.1%	45.6%

The inventory purchase adjustments are something that happen every year because there are always more acquisitions. This charge has the company marking up inventory value at the time of the deal and that in turn boosts cost of goods sold and hurts margin. However, the charge is added back and going forward margins should also improve without adjusted inventory remaining. This is a non-cash charge and it was worth $1.08 in EPS.

Costs to integrate acquisitions. Again, when isn't this going on at TDG? It involves moving employees, consolidating facilities, merging accounting systems… Much of this would involve cash to pay to break leases, buy new equipment/software, severance, moving companies. This was $0.86 of EPS last year. We also think some other on-going costs can be put into these types of charges. For example, a manager spends two weeks traveling to

deal with the integration activities and his hotel, airfare, food, and two weeks of pay may be added to this account. However, if he had been traveling to meet with Boeing and Airbus, those costs would not have been added back. This can create a margin headwind going forward when those on-going costs occur next year as a sales call.

Transaction expenses for acquisitions is legal fees, consultant fees, etc. These also consume cash and recur at TDG. Adding this back contributed $0.43 to EPS.

Stock compensation is something we do not consider acquisition-related nor is it one-time in nature. It is also increasing as a percentage of sales at TDG. It was 116bp of cost in 2015 and reached 179bp in 2019. This rising cost is a headwind for margin expansion. Employees consider it pay, the stock is getting some dilution from it, which reduces EPS. Why should this cost not be considered real? This was $1.31 in EPS.

Refinancing and other is nothing new for a company with a sizeable debt load. Even without acquisitions, TDG needs to roll over debt and has refinanced at different levels of seniority and maturity. We don't consider these to be one-time either and they added $0.12 to EPS.

Altogether, TDG reported an increase of 520bp of margin by ignoring these expenses.

We Wonder if the Esterline Deal Breaks the Historical Track Record on Acquisitions?

TDG has made 66 deals over the years as part of its growth plan and expects to continue doing this. Many of these other deals were smaller in size and were privately held – often by LBO firms. Margins could grow quickly simply eliminating the management fees, consolidating the R&D operations and having experienced managers at TDG take over. Plus, many deals were very niche-oriented also.

Esterline at $3.9 billion was the largest deal TDG has made. It also had many operating parts that fit into several areas at TDG – it wasn't a company where 90% of sales came from working with two types of Boeing planes for example. Integration will likely take longer, and its lower margins already made an impact on recent results in 2019 as the steady rise in adjusted EBITDA margins posted a 290bp decline.

Pulling up the 2017 10-K for Esterline – we see that the company had not been posting much sales growth or margin expansion:

Esterline	2017	2016	2015	2014	2013
Sales	$2,000.3	$1,993.5	$2,002.8	$2,029.5	$1,866.7
Gross Profit	$660.0	$661.9	$677.9	$714.7	$698.1
Margin	33.0%	33.2%	33.8%	35.2%	37.4%
EBITDA	$285.5	$264.6	$241.8	$344.3	$339.6
Margin	14.3%	13.3%	12.1%	17.0%	18.2%

The company had seen some platforms it supplied wind down. There were some accounting issues relating to control to resolve as well. In our view, it differs from other deals where other financial buyers owned the company and had already stripped out some costs and made integration into TDG easier.

This is a big part of TDG now as opposed to other deals bringing $50-$100 million in sales. We're not going to say TDG cannot integrate Esterline – just that this is a different type of deal than what the company has historically digested. Also, the company spoke on the call about looking at more large deals in the future.

Some Issues with Large Intangible Assets

Investors would expect a company that has done so many acquisitions to have items like goodwill and acquired technology on the books. There is $16.3 billion in total assets at TDG with $7.8 billion being goodwill (48%), and $2.7 billion being other intangibles (17%). Of the $2.7 billion in other intangibles – 35% are related to trademarks and tradenames which are not being amortized.

We think TDG is using a very long amortization period for these assets. Acquired technology is being amortized over 20-22 years. Had that been created in-house, the equipment would be depreciated over 2-10 years and the R&D expensed as incurred.

Also, we question why Customer Relationships are getting so much allotment of value. The gross value of Customer Relationships is $438 million, which is 13% of total gross intangibles other than goodwill. There is a fairly small number of platforms to sell parts to. TDG was already a decent-sized company with a presence in many markets. Did any of

these deals actually result in opening the door for TDG to sell to Airbus, American Airlines, or the U.S. Airforce?

As long as the Return on Capital remains high enough, TDG will not see any impairments to these intangibles. However, we also question if the very long amortization lives impacting only a few of the acquired assets is actually boosting the ROI. Paying out huge dividends on occasion has also turned the equity base to a large negative figure, which further can boost ROI:

ROI for TDG	2019	2018	2017	2016	2015
Reported EBIT	$1,926.5	$1,655.4	$1,482.8	$1,267.3	$1,071.5
Debt	$16,898.9	$12,877.2	$11,762.7	$10,195.6	$8,349.6
Equity	-$2,885.0	-$1,808.0	-$2,951.0	-$651.5	-$1,038.3
ROI for TDG	13.7%	15.0%	16.8%	13.3%	14.7%

It's tough to see impairments when the ROI is 15%. (Remember Esterline only had a 6.5-month impact on income but its full debt is on the balance sheet and likely accounts for the ROI being down 1-point in 2019). However, what if the amortization of intangibles was double what is being reported and occurring over a 10-year period like the depreciation? Also, what if the equity balance was really about $3 billion before the dividends. Then ROI drops noticeably:

ROI for TDG	2019	2018	2017	2016	2015
Reported EBIT	$1,926.5	$1,655.4	$1,482.8	$1,267.3	$1,071.5
Extra Amortization	$135.0	$72.5	$89.2	$77.4	$54.2
Adj. EBIT	$1,791.6	$1,583.0	$1,393.6	$1,189.9	$1,017.3
Debt	$16,898.9	$12,877.2	$11,762.7	$10,195.6	$8,349.6
Adj. Equity	$2,922.0	$2,287.5	$1,088.4	$806.3	$416.5
Adj ROI	9.0%	10.4%	10.8%	10.8%	11.6%

Just making those minor adjustments, and suddenly ROI drops by 5-points to essentially 10%. We do not think that matching the amortization period of only 21% of acquired assets to that of current depreciation lives is that onerous of a standard. Moreover, 79% of the acquired intangible assets are still not being expensed at all.

TDG is paying 6.0%-7.5% interest on a large part of its total debt. An ROI of 10%-11% still exceeds that. However, that is only because $8.8 billion in acquisition costs are not being amortized. Over 20-years, that would be $440 million in additional expense, That would

drop ROI to 7% very quickly. It is doubtful, TDG will ever have to change or be held to this type of standard. However, we think it is important for investors to see that growth through acquisition can often appear more profitable than building internally even though the prices paid for acquisitions can exceed the cost of internal growth.

We also think the margin expansion that is touted by TDG owes some of its success to having the acquisition costs that are amortized remain at a fixed rate, against even the modest 2%-3% organic sales growth that TDG normally has.

In the 2019 10-K, TDG forecasts that its amortization expense will be $119.1 million per year from 2021-24. That is 228bp of margin on sales of $5.2 billion. In 3-years at 3% organic CAGR, the sales would rise to $5.7 billion and the fixed amortization would boost margins by 20bp.

How Much More Can TDG Comfortably Borrow?

As noted earlier, TDG reports free cash flow of over $900 million per year. However, that is before acquisitions and any dividends. To fund those events, the company borrows the money. Debt is currently $16.9 billion. That includes $350 million for a securitization facility as TDG is already pulling cash out of receivables.

The maximum leverage it can carry as a multiple of EBITDA is 7.25x. That is net of cash and currently stands at 5.34x using 2020's forecast for $2.825 billion in EBITDA. Much of the company's debt is subordinated to the term loans. For senior secured debt, the ratio cannot exceed 5.0x and net of cash is only 2.1x now. Based on just the ratios, TDG can borrow about $5 billion more if necessary.

The main point to watch here is the term loans currently require $19.1 million in principal payments per quarter or essentially $76 million per year. That comes out of the $900 million of free cash flow. Also, when the leverage ratio exceeds 5.0x – then it must use 50% of excess cash flow to prepay the term loans. At a ratio of 4.5x-5.0x – then 25% of excess cash flow mush prepay the term loans.

Excess cash flow is defined as net income plus non-cash charges and non acquisition-related working capital declines less capital spending, less required principal payments, plus cash

from asset sales. So, the amount of free cash flow that is fully available is likely about half what TDG's cash flow statement shows.

Also, while not critical at this point, the fixed charge coverage is declining.

	2019	2018	2017	2016	2015
Fixed Charge Cov.	2.2x	2.5x	2.4x	2.6x	2.5x

Since capital spending is a cash flow issue, we will point out here that we do not see an issue with TDG under-investing in this area. It routinely exceeds depreciation, so fixed assets are likely newer and up-to-date:

	2019	2018	2017	2016	2015
Depreciation	$89.7	$56.4	$50.9	$43.5	$35.9
Capital Spending	$101.6	$73.3	$71.0	$44.0	$54.9

Ingersoll-Rand (IR) EQ Review

Current EQ Rating*	Previous EQ Rating
4-	na

6- "Exceptionally Strong"
5- "Strong"
4- "Acceptable"
3- "Minor Concern"
2- "Weak"
1- "Strong Concerns"

Note that a "+" sign indicates the earnings quality improved in the most recent quarter while a "–" sign indicates deterioration

*For a more detailed explanation of the EQ Review Rating scale, please refer to the end of this report

We initiate earnings quality coverage of IR with a 4- (Acceptable) rating.

Overall, we see IR's earnings as being mostly "clean" but we do have the following observations that investors should be aware of when viewing the company's headline earnings numbers.

- IR sells extended warranties with certain products. It defers the associated revenue and recognizes it "on a straight-line basis over the life of the contract, unless another method is more representative of the costs incurred." The latter part of the description seems to indicate some subjectivity that could conceivably leave open the possibility to manipulate revenue recognition. The company's disclosures allow us to calculate the amount of the extended warranty deferral amortized in a quarter as a percentage of the average deferred balance. This figure increased sequentially in the 9/19 quarter as the sequential increase in warranties issued in the period significantly lagged the amount amortized into revenue. We estimate this could have added as much as a penny per share to EPS in the period. However, we are not especially concerned given the small amount and the fact that there was a large increase in warranties issued in the 6/19 quarter. Nevertheless, this is an area to monitor on a regular basis.

- IR regularly records material amounts under results of discontinued operations. Such disclosures typically relate to business units that are intended to be sold in the foreseeable future and will therefore not continue to impact ongoing operations. However, in the case of IR, these amounts relate to obligations including asbestos-related payments and receipts, litigation costs, and postretirement benefit payments

that the company agreed to retain at the time it divested those businesses. These amounts fluctuate and can be very material. Since they are included in discontinued operations, they are not reflected in headline earnings numbers or non-GAAP disclosures and are likely dismissed by most investors despite the fact they will likely continue to impact shareholders' equity well into the future.

- With respect to the above point, we do not have a problem with adjusting out large asbestos-related payments and receipts when calculating a figure intended to represent ongoing operating growth. With that in mind, we note that the company does not adjust the asbestos-related amounts generated in its ***continuing*** operations out of its non-GAAP disclosures. While these amounts are much smaller than those included in discontinued operations, they can be materially positive or negative to a particular quarter. Case in point, the increase in asbestos-related income in the 9/19 quarter added about a penny per share to results.

Recognition of Warranty Revenue

One issue to monitor with IR's accounting is its recognition of revenue from issuing extended warranties. The company's description of its accounting for extended warranty revenue reads:

> "The Company's extended warranty liability represents the deferred revenue associated with its extended warranty contracts and is amortized into *Net revenues* on a straight-line basis over the life of the contract, ***unless another method is more representative of the costs incurred."***

(Note that these extended reserves are separate from the company's standard product warranties for which the company also establishes reserves at the time of sale.)

The following table shows the development of the extended warranty deferred revenue account for the last eight quarters and the calculation of amortization of deferred revenue as a percentage of the average liability balance outstanding during the period:

	9/30/2019	6/30/2019	3/31/2019	12/31/2018
Amortization of Deferred Revenue for the Period	-$32.5	-$28.8	-$27.2	-$30.3
Additions for Extended Warranties Issued During Period	$35.6	$34.6	$28.4	$32.5
Changes to Accruals Related to Preexisting Warranties	$0.0	-$0.1	-$0.2	-$0.6
Translations	-$0.7	$0.2	$0.0	-$0.6
Deferred Extended Warranty Revenue Ending Balance	$301.5	$299.1	$293.2	$292.2
Amortization of Def. Rev. % of Avg. Reserve Balance	10.82%	9.72%	9.29%	10.39%

	9/30/2018	6/30/2018	3/31/2018	12/31/2017
Amortization of Deferred Revenue for the Period	-$30.1	-$28.6	-$26.0	-$24.0
Additions for Extended Warranties Issued During Period	$26.6	$33.2	$23.8	$20.8
Changes to Accruals Related to Preexisting Warranties	$0.2	$0.2	-$0.3	$0.8
Translations	$0.1	-$1.3	$0.4	$0.2
Deferred Extended Warranty Revenue Ending Balance	$291.2	$294.4	$290.9	$293.0
Amortization of Def. Rev. % of Avg. Reserve Balance	10.28%	9.77%	8.91%	8.16%

Generally speaking, an increase in the amortization of deferred revenue relative to the reserve balance could be an indication of more aggressive revenue recognition. We estimate if the percentage of revenue recognized relative to the average deferred balance had remained constant with the previous quarter's level, it would have taken about a penny per share off of EPS in the quarter. However, this works both ways as the same exercise yields a penny per share drag on the 3/19 quarter.

For more perspective, the following table shows the sequential increase in warranties issued in the quarter and the sequential increase in extended warranties issued during the period.

	9/30/2019	6/30/2019	3/31/2019	12/31/2018
Amortization of Def. Rev. % of Avg. Reserve Balance	10.82%	9.72%	9.29%	10.39%
Sequential Increase in Warranties Issues	2.89%	21.83%	-12.62%	22.18%
Sequential Increase in Amortization of Deferred Revenue	12.85%	5.88%	-10.23%	0.66%

	9/30/2018	6/30/2018	3/31/2018	12/31/2017
Amortization of Def. Rev. % of Avg. Reserve Balance	10.28%	9.77%	8.91%	8.16%
Sequential Increase in Warranties Issues	-19.88%	39.50%	14.42%	-16.13%
Sequential Increase in Amortization of Deferred Revenue	5.24%	10.00%	8.33%	-21.05%

The 9/19 quarter does appear somewhat unusual in there was only a slight sequential increase in warranties issued while the increase in revenue recognized rose by almost 13%. This was a marked acceleration from the 6/19 quarter. It is possible that the large number of warranties sold in the 6/19 quarter fell later in the period so that quarter did not reflect

a full period of amortization, thus inflating amortization in the 9/19 quarter relative to new warranties sold. Therefore, we are not especially concerned with the increase in the amortization of deferred revenue, especially given the fact that we are only dealing with a possible 1 cps boost. However, we do note that the company's description of its extended warranty accounting policy does seem to leave room open for subjectivity which makes this an area of potential abuse that should be monitored every quarter.

Ongoing Retained Obligations Are Included in Discontinued Operations

IR is still dealing with the fallout from its sale of products containing asbestos decades ago. The company's balance sheet reflects estimated asbestos-related liabilities of $562.5 million offset by estimates for probable insurance recoveries of $299.6 million. The resulting $262 million net liability is not a material threat to the company's financial standing given the $830 million in cash on the balance sheet and likelihood it will be paid out over many years. However, one aspect of the asbestos liabilities investors should be aware of is the fact that a portion of the ongoing activity related to settling the claims is included in results from discontinued operations. The asbestos litigation was aimed largely at the company's Trane operations which IR still owns, as well as some businesses which have since been sold-namely Ingersoll-Dresser Pump which was divested in 2000. Since the Ingersoll-Dresser operations were sold, the resulting asbestos-related payments and receipts have been included as classified as discontinued operations that are excluded from the company's non-GAAP numbers. The following table shows asbestos-related income and expense for the last 8 quarters broken out between continuing and discontinued operations:

Income/(Expense) Related to Asbestos Claims	9/30/2019	6/30/2019	3/31/2019	12/31/2018
Asbestos Income/(Expense) in Continuing Operations	$3.7	$5.9	-$1.8	-$11.7
Asbestos Income/(Expense) in Discontinued Operations	$36.0	-$2.5	-$3.0	-$35.6
	9/30/2018	6/30/2018	3/31/2018	12/31/2017
Asbestos Income/(Expense) in Continuing Operations	$0.5	-$0.7	$1.5	-$0.7
Asbestos Income/(Expense) in Discontinued Operations	-$11.4	-$2.3	-$7.2	-$34.8

Clearly, these amounts are volatile and can be very material in certain quarters. The bulk of these amounts is related to the Ingersoll-Dresser operations and are therefore lumped into discontinued operations. The purpose of discontinued operation disclosure is to show amounts that will soon not impact a company's ongoing operations. However, in this case, these payments will continue to impact IR well into the future. Thus, investors looking only

at non-GAAP numbers from continuing operations are not getting the whole picture of the impact on the company's shareholders' equity in the period.

In addition to the asbestos liabilities, the company agreed to retain other obligations associated with its 2013 spin-off of its commercial and residential security business including postretirement benefits. As with the Ingersoll Dresser asbestos liabilities, these amounts are included in discontinued operations and therefore not reflected in adjusted EPS. The company does disclose the total amount of all expenses related to retained liabilities which is shown in the table below. Note that these amounts include the asbestos liabilities shown in the table above:

Earnings /(Loss) from Retained Obligations in Disc. Ops	9/30/2019	6/30/2019	3/31/2019	12/31/2018
Pretax Earnings/(Loss)	$32.0	-$7.9	-$1.9	-$48.8
	9/30/2018	6/30/2018	3/31/2018	12/31/2017
Pretax Earnings/(Loss)	-$16.0	-$8.6	-$12.1	-$40.7

By comparing to the above previous table, we can see that the bulk of the impact from retained obligations is related to the asbestos liabilities. However, there are still material non-asbestos related amounts that are being included in results from discontinued operations despite the fact they will likely recur into the future.

Asbestos-Related Amounts from Continuing Operations Not Adjusted Out of Non-GAAP

We discussed above that the company lumps the asbestos impact from previously divested operations into results of discontinued operations despite the fact that the company retained the obligation to pay them. It is typical for companies to exclude litigation related inflows and outflows from non-GAAP results. From that standpoint, we do not have a problem with the idea of excluding such payments from an adjusted earnings figure attempting to show the growth in the ongoing operations as long as investors are aware of the impact on cash flow and shareholders' equity. However, that brings up the issue that the company does not exclude the asbestos-related expenses and income from its continuing operations from its non-GAAP adjustments. While the asbestos impact from continuing operations is not as large as that related to discontinued operations, it can nonetheless be material. In the case of the 9/19 quarter, the increase in asbestos-related income included in continuing

operations was an approximate 1 cps boost while the 6/19 quarter benefitted by roughly double that amount.

Explanation of EQ Rating Scale

Rating	Description
6- "Exceptionally Strong"	Indicates uncommonly conservative accounting policies to the point that revenue and earnings are essentially understated relative to the company's peers. Higher possibility of reporting positive earnings surprises
5- "Strong"	Indicates the company has no areas of concern with its reported results and we see very little risk of the company disappointing due to recent results being overstated from aggressive reporting in recent periods.
4- "Acceptable"	Indicates the company may have exhibited a minor "red flag", but the severity of the issue is not yet a concern. Minimal risk of an earnings disappointment resulting from previous earnings or cash flow overstatement
3- "Minor Concern"	Indicates the company has exhibited either a larger number of or more serious warning signs than companies receiving a 4. The likelihood of an immediate earnings or cash flow disappointment is not considered to be high, but the signs mentioned deserve a higher degree of attention in the future.
2- "Weak"	Indicates the company's recently reported results have benefitted materially from aggressive accounting. Follow up work should be performed to determine the nature and extent of the problem. There is a possibility that upcoming results could disappoint as the impact of unsustainable benefits disappears.
1- "Strong Concerns"	Indicates that the company's recent results are significantly overstated and that we view a disappointment in upcoming quarters is highly likely.

In addition to the numerical rating, the EQ Review Rating may also include either a minus or plus sign. A minus sign indicates that our analysis shows the overall earnings quality of the company has worsened since the last review and there is a possibility the numerical rating will fall should the problem continue into the next quarter. Likewise, a positive sign indicates that the overall earnings quality is improving, and the company may see an upgrade in its numerical rating should the trend continue.

Key Points to Understand About the EQ Score

The EQ Review Rating is much more than a blind, quantitative scoring method. While we utilize proprietary adjustments, ratios, and methods developed over decades of earnings quality analysis, the foundation of all of our analysis is reading recent SEC filings, press releases, conference call transcripts and in some cases, conversations with managements.

The EQ Review Rating is not comparable to a traditional buy/sell rating. The Rating is intended to specifically convey the extent to which reported earnings may be over/understated. Fundamental factors such as forecasts for future growth, increasing competition, and valuation are not reflected in the rating. Therefore, a high score does not in itself indicate a company is a buy but rather indicates that recent results are a good indication of the underlying earnings and cash generation capacity of the company. A low score (1-2) will likely result in us performing a more thorough review of fundamental factors to determine if the company warrants a full-blown sell recommendation.

Disclosure

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