A Work Project, presented as part of the requirements for the Award of an International Master Degree in Finance from the NOVA School of Business and Economics

POTENTIAL LBO OF CTS CORP: BUSINESS PLAN, EXIT AND RETURNS

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Abstract:
The following paper focuses on the development of a business plan, exit strategy and calculation of returns for the potential LBO of CTS Corporation, a US-based electronic component manufacturer that serves OEMs in five different end markets. It develops the business plan by clearly showing growth and cost drivers, presents the entry valuation and returns and defines a clear exit strategy in an effort to simulate a section of a real-life Investment Committee Paper.

Keywords:
Private Equity, LBO, Valuation, Returns

Disclaimer
This project was developed in a group and constitutes the first section of the entire thesis. It was done with an academic purpose, using publicly available information and information made available directly by the company. The second part of the work was delivered under the name: "Potential LBO of CTS Corp: Structuring an LBO Deal"

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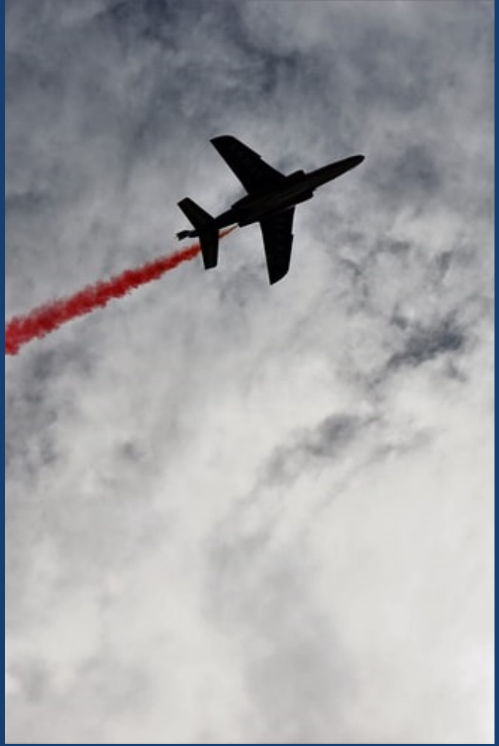


CTS CORPORATION

Individual Report: Business plan, exit and returns

Your Partner in Smart Solutions

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Master in Finance Thesis: Private Equity Challenge

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Business Plan

Investment Case

NOVA SCHOOL OF
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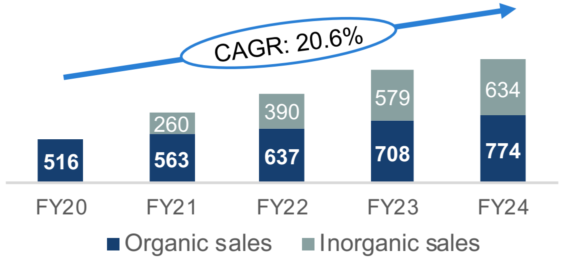
R&D investments, market diversification and M&A activity will drive growth

Top line

Sales in $m



1 Organic growth

Mainly driven by a combination of four factors:

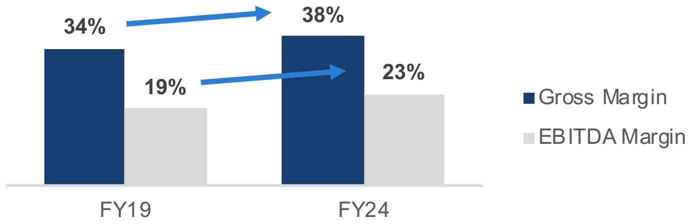
- Increased R&D, **focused on cell base station sensors, sonar aerospace components and haptic applications**
- Aggressive **internationalization** plan through heightened **sales efforts** (strategic hires and technical training programs) in **APAC and Europe**
- Capture of key customers in **Telecom & IT** and **Aerospace & Defense** end-markets to benefit from strong segment CAGRs
- Re-negotiation and **improvement of contractual terms** in purchase agreements with customers

2 Inorganic growth

Horizontal acquisition of 4 strategic targets in order to:

- Achieve **additional revenues above $600m at exit** from add-on targets located in APAC and Europe
- Aggressively enter Telecom & IT and Aerospace & Defense markets in **APAC region,** strengthen position in Europe
- Support internationalization plan through **cost synergies** achieved with APAC targets

Bottom Line



1 COGS

- Increased bargaining power with suppliers (due to larger size) and economies of scale in manufacturing are expected to decrease **COGS** to 62% of revenues (v. 66% in 2019)

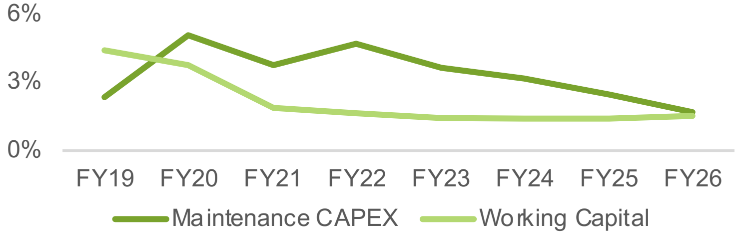
2 Operating expenses

- **Selling and marketing** expenses will increase due to the strategic hires of sales engineers with experience in Aerospace & Defense and Telecom & IT in APAC & Europe
- **Decreases in G&A expenses are anticipated from ERP-system implementation** and strong cost-containment policies, and are likely to offset the increased sales costs
- Some restructuring costs related to the consolidation of manufacturing are expected to drive up **G&A** (incl. severance, equipment relocation, travel costs)
- Identified as a **main driver for sales, R&D spending will be prioritized** to develop strategic products in high-potential market segments, improve CTS' IP position and create entry barriers. They will decrease after FY20

Restructuring charges and **other results** are not forecasted due to Mr. Agrawal's (CTS' CFO) recommendation

Investments

% of sales



1 Maintenance CAPEX

- CAPEX outflows will **remain in line with historical asset turnover ratios**, investing in new equipment and improvements that adequately support the targeted sales level

2 Acquisition CAPEX

- Additional large capital expenditures are expected to be incurred during the first 2-3 years to **acquire 4 synergistic horizontal targets that will add c. $94m in EBITDA by 2024** and bring valuable intangible assets, such as IP, patents, and client lists
- These acquisitions will be financed through the company's **cash flow, an acquisition credit facility and an equity injection**

3 Working capital

- Working capital is reduced during the investment period but rises to entry levels at exit
- **CCC** is reduced from **38 at entry to 28 at exit**
  - DSO reduced from 55 days to 53 days
  - DIO reduced from 42 days to 37 days
  - DPO increased from 59 days to 62 days

Revenue growth driven by the Aerospace & Defense and Telecom & IT markets

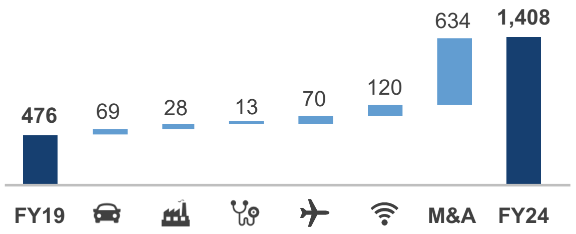
Revenues (in $m)	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	CAGR 19-24
Transportation	274.9	301.1	318.4	335.9	346.0	358.1	367.0	387.2	408.5	426.9	4%
Industrial	76.1	84.7	75.3	84.0	88.6	93.5	98.6	103.0	107.7	112.5	6%
Medical	33.8	42.3	36.6	40.5	43.9	46.3	47.5	49.6	51.9	54.2	6%
Aerospace & Defense	16.9	23.5	29.0	37.7	50.9	68.8	86.0	98.8	104.1	109.6	28%
Telecom & IT	21.1	18.8	16.6	17.6	33.3	70.0	108.5	135.7	158.7	168.3	52%
Incremental sales from M&A	-	-	-	-	260.3	390.0	578.9	633.6	679.8	713.0	
Total Revenues	**423.0**	**470.5**	**476.0**	**515.6**	**823.0**	**1,026.7**	**1,286.6**	**1,408.0**	**1,510.7**	**1,584.5**	**24%**
% total growth	*7%*	*11%*	*1%*	*8%*	*60%*	*25%*	*25%*	*9%*	*7%*	*5%*	

Comments

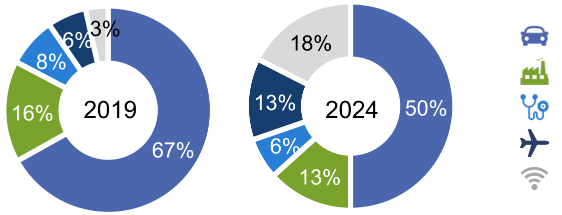
Organic growth rate per end-market

	FY20	FY21	FY22	FY23	FY24	FY23	FY26
	5%	3%	3%	2%	5%	5%	4%
	12%	5%	5%	5%	4%	4%	4%
	11%	9%	5%	2%	4%	4%	4%
	30%	35%	35%	25%	15%	5%	5%
	5%	90%	110%	55%	25%	17%	6%
	8%	**9%**	**13%**	**11%**	**9%**	**7%**	**5%**

Revenue contribution per strategy



Sales Split 2019 vs 2024



Drivers of growth by end market

- **Initial defocus** on transportation clients to gradually reduce its sales share, while maintaining a healthy growth at around 4%
- Higher sales with **top customers** and further penetration in **hybrid and autonomous driving** with sensors and specialized pedals

- Larger **defense spending in NATO states** increases demand for existing products as well as new sonobouy technologies
- Continued sales efforts to book new business and increase sales within **top key players**, such as **Safran and Lockheed Martin**

- Increasing global seaborn trade activities will materialize in higher demand for **sonar systems** and single crystal technology
- **Flow metering** is expected to experience a strong demand due to the likely adoption of such procedure in several industries

- Strong demand from customers due to worldwide adoption of 5G technology and robust connectivity trends, especially in the **small cell base stations (17% CAGR)** segment, combined with contract improvements with key players **Nokia and Ericsson**

- Growth will be achieved mainly through the **expansion of applications of medical sensors** (CAGR 10%) for ultrasound imaging – focus in Europe due to aging population – and capture of newest technology-focused players in the medical industry

M&A

- Growth will be accelerated through **acquired revenues of over $600m** and subsequent margin uplift through cost synergies
- The 4 targets to be acquired are selected based on strategic and financial fit, and their presence in high growth markets or regions

Margin improvement stems from sales of high-margin products and efficiencies

Expenses (in $m)	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	CAGR 19-24	
Gross Profit	**140.4**	**165.0**	**163.0**	**185.6**	**205.1**	**234.9**	**264.3**	**292.7**	**317.8**	**337.3**	***12%***	1
% margin	*33%*	*35%*	*34%*	*36%*	*36%*	*37%*	*37%*	*38%*	*38%*	*39%*		
SG&A	(51.3)	(51.2)	(45.4)	(54.7)	(57.7)	(63.0)	(67.9)	(70.5)	(70.6)	(74.1)		2
Management compensation	-	-	-	(0.7)	-	-	-	-	-	-		
Research & development	(25.1)	(25.3)	(26.1)	(40.2)	(32.6)	(36.9)	(41.0)	(44.9)	(48.2)	(50.5)		3
Other expenses	(4.8)	(5.0)	-	-	-	-	-	-	-	-		
Organic EBITDA	**59.2**	**83.6**	**91.5**	**90.1**	**114.8**	**135.0**	**155.3**	**177.3**	**199.0**	**212.6**	***14%***	4
Add-ons EBITDA	**-**	**-**	**-**	**-**	**29.7**	**49.0**	**81.7**	**93.6**	**104.9**	**114.7**		5
Total EBITDA	**59.2**	**83.6**	**91.5**	**90.1**	**144.5**	**184.0**	**237.0**	**270.9**	**303.9**	**327.4**	***24%***	
% margin	*18%*	*19%*	*19%*	*20%*	*18%*	*18%*	*18%*	*19%*	*20%*	*21%*		
Normalization adjustments	18.3	5.0	-	11.0	-	-	-	-	-	-		6
Normalized EBITDA	**77.5**	**88.5**	**91.5**	**101.1**	**144.5**	**184.0**	**237.0**	**270.9**	**303.9**	**327.4**	***24%***	
% total margin	*18%*	*19%*	*19%*	*20%*	*18%*	*18%*	*18%*	*19%*	*20%*	*21%*		
% organic margin	*18%*	*19%*	*19%*	*20%*	*20%*	*21%*	*22%*	*23%*	*24%*	*24%*		

Cost drivers

2
- **SG&A** will initially increase to **11% of organic revenues** (from an average of 9.5% in FY19) due to the structure personnel increase, sales trainings, ERP system rollout costs, and some expected early lease terminations from factory consolidation. These costs will **return to averages** as sales materialize and cost-efficiencies are

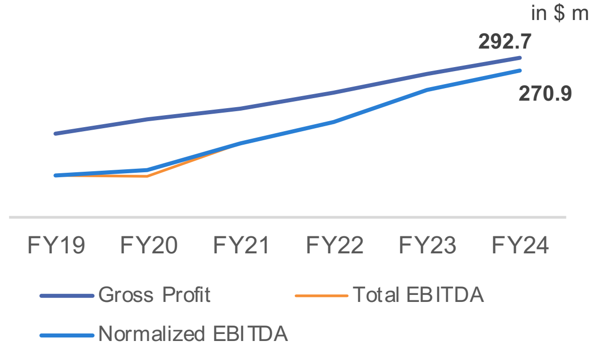
3
- **R&D** spending is projected to be aggressive during the first year – at c. **8% of sales** – to promptly expand the three business lines with products that serve targeted market segments, develop new applications for existing products and strengthen the firm's IP position internationally. R&D will go back to normal levels (6%) in FY21[2]

6
- Normalization adjustments come from **non-recurring costs and historical costs that will not continue in the future.**

Comments: Profitability

1

Gross margin improvements will stem from two sources:
- Increased sales of **custom-engineered products** (historically higher margins) vs standard components
- Greater **negotiation power** with suppliers and positive **scale effects**, reducing the cost of raw materials



4

Organic EBITDA growth comes from:
- Strong revenue growth in high-margin segments
- **Efficiencies achieved at overhead levels**
- Higher gross margins

Lack of growth in total EBITDA FY20 comes from higher R&D spending that year. From a normalized standpoint, EBITDA grows 10% YoY

5

Inorganic EBITDA comes from the acquisition of 4 fast growing companies in APAC and Europe, which will be added to the group between 2020 and 2022, allowing CTS to capture value from early on

From a normalized standpoint, EBITDA grows 10% YoY in FY20

Reported to Adjusted EBITDA bridge (in $m)	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26
Reported Organic EBITDA	**59.2**	**83.6**	**91.5**	**90.1**	**114.8**	**135.0**	**155.3**	**177.3**	**199.0**	**212.6**
% growth		*41%*	*10%*	*-2%*	*27%*	*18%*	*15%*	*14%*	*12%*	*7%*
1 Non-recurring restructuring charges	4.1	5.1	-	-	-	-	-	-	-	-
2 Pension settlement charge	13.5	-	-	-	-	-	-	-	-	-
3 Gain/loss on disposition of PP&E	0.7	(0.1)	-	-	-	-	-	-	-	-
4 One-off R&D Expense	-	-	-	10.3	-	-	-	-	-	-
5 One-off management compensation	-	-	-	0.7	-	-	-	-	-	-
Total adjustments to EBITDA	**18.3**	**5.0**	**-**	**11.0**	**-**	**-**	**-**	**-**	**-**	**-**
Adjusted (Normalized) Organic EBITDA	**77.5**	**88.5**	**91.5**	**101.1**	**114.8**	**135.0**	**155.3**	**177.3**	**199.0**	**212.6**
% growth		*14%*	*3%*	*10%*	*14%*	*18%*	*15%*	*14%*	*12%*	*7%*

EBITDA FY20 – Reported to Adjusted Bridge ($m)

Comments

1
- **Restructuring charges** are related to the **2013 and 2016 strategy innovation programs**. On a conversation with CTS' CFO, it was understood that these charges are not expected to continue going forward. Therefore, they have been removed from historical EBITDA and excluded from the forecasts

2
- **One-time, non-cash settlement charge** that resulted from CTS offering its participants a lump-sum payment to settle their future pension benefits. It was allocated 36% to COGS, 49% to SG&A, and 15% to R&D [1]

3
- **Gain / losses on disposition of PP&E** are non-recurring events and therefore should be excluded from EBITDA

EBITDA FY20

4
- CTS' **R&D investments only convert to sales after 12 months** due to the nature of custom-engineered components, which are a main element of the business plan. Therefore, in order to successfully diversify the Company's end-markets, there will be an **additional R&D expense in FY20 (8% of revenue) to develop a technological base and know-how aimed at the Telecom & IT and Aerospace & Defense markets.** However, this is a one-off expense and is therefore removed from EBITDA

5
- This adjustment aims to remove from EBITDA the **one-time payment to the management team** as a compensation for a non-compete clause amended into their contracts upon transaction

Notes: 1) The lump sum distributed to employees that opted for this option was large enough to trigger the pension settlement charge under U.S. GAAP

Incentives include sweet equity with vesting rules, an NCC and a ratchet clause

Management's compensation package

- The compensation package for CTS' Management team, on top of their current salaries, is composed of 3 main elements:

1 **Participation in Sweet Equity of $11.5m (15% of total ordinary equity)**. This value corresponds to twice the combined total yearly wages – including cash, stock and other compensation, instrument that **returns a 19.4x MM ($223.9m in capital proceeds)**

- Management's sweet equity stake will be vested according to pre-determined vesting rules, as can be seen on the table to the right
- The $11.5m entry equity from management is split in the following way:
  - $6.9m held by Mr. O'Sullivan, CTS' CEO, which results in **$133.5m proceeds in 2024**
  - $2.6m held by Mr. Agrawal, CTS' CFO, resulting in proceeds of **$49.7m in 2024**
  - $2.1m held by Mr. Machado, CTS' General Counsel and Secretary, who receives **proceeds of $40.7m at exit**

2

3 A **ratchet clause** in the equity contract, protecting ordinary equity from being diluted after the equity injection. Such equity injection will be fully funded by the subordinated loan and won't affect management's equity stake

- A monetary **immediate payment of 20% of their current cash salary**, payable in 2020, to compensate for a non-compete clause (NCC) which will be added to the amended contracts. With such clause, management agrees not to enter into or start a similar profession or trade in competition against CTS for two years, should they leave the company prior to exit

4 A long-term incentive (LTI) in the form of a **permanence bonus**, could be an additional element in case of need for room of negotiation. The recommended instrument would correspond to **1.3x management's cash annual salary ($4.4m),** is vested over a 4-year period starting in 2021 through 2024 and is dependent on **achieving business plan EBITDA levels**[1]

NCC compensation

Current Cash Salary (Annual)	
Kieran M. O'Sullivan	$2.0m
Ashish Agrawal	$0.8m
Luis F. Machado	$0.6m
Total	**$3.4m**

Compensation in 2020	
Kieran M. O'Sullivan	$0.4m
Ashish Agrawal	$0.2m
Luis F. Machado	$0.1m
Total	**$0.7m**

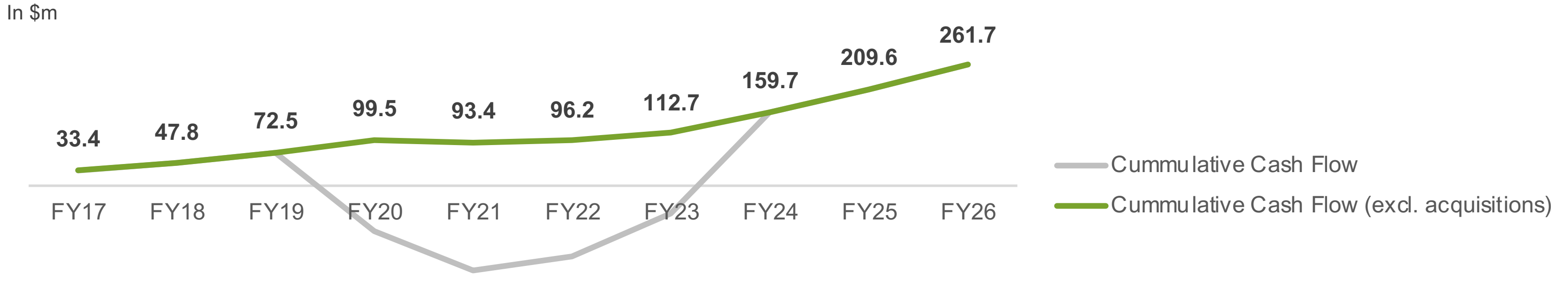
20% of salary

Vesting Rules (in $m)	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27
Management's Final Sweet Equity Stake	**15%**							
Sweet equity vesting rules								
% vested per year	*0%*	*10%*	*30%*	*50%*	*100%*	*100%*	*100%*	*100%*
Vested equity stake	**0%**	**2%**	**5%**	**8%**	**15%**	**15%**	**15%**	**15%**
Value of ordinary shares at exit	-	293.1	538.5	1,101.3	1,492.7	1,904.3	2,246.7	2,588.8
Value of management's stake if 100% vested	-	*44.0*	*80.8*	*165.2*	*223.9*	*285.7*	*337.0*	*388.3*
Management proceeds under vesting rules	**0.0**	**4.4**	**24.2**	**82.6**	**223.9**	**285.7**	**337.0**	**388.3**
Kieran M. O'Sullivan	0.0	2.6	14.4	49.2	133.5	170.3	200.9	231.5
Ashish Agrawal	0.0	1.0	5.4	18.3	49.7	63.4	74.8	86.1
Luis F. Machado	0.0	0.8	4.4	15.0	40.7	52.0	61.3	70.7

Strong EBITDA growth and solid cash flow generation expected

Free Cash Flow (in $m)	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26		CAGR FY19-24
EBITDA	**77.5**	**88.5**	**91.5**	**101.1**	**144.5**	**184.0**	**237.0**	**270.9**	**303.9**	**327.4**	1	***24%***
Depreciation & Amortization	(20.7)	(22.5)	(22.3)	(24.1)	(34.5)	(45.3)	(57.5)	(62.9)	(67.4)	(70.7)	2	
EBIT / Operating Profit	**56.8**	**66.0**	**69.3**	**76.9**	**110.0**	**138.7**	**179.5**	**208.0**	**236.5**	**256.7**		***25%***
Corporate Income Tax	(7.8)	(11.9)	(17.5)	(16.7)	(27.9)	(35.1)	(45.5)	(52.7)	(59.9)	(65.0)		
Maintenance CAPEX	(18.1)	(28.5)	(11.2)	(26.1)	(39.5)	(64.0)	(70.3)	(69.3)	(64.0)	(54.6)	3	
Acquisition CAPEX (net of cash acquired)	-	-	-	(195.3)	(80.9)	(170.5)	-	-	-	-	4	
Working capital needs	(13.9)	(16.8)	12.2	2.8	4.2	(1.1)	(2.0)	(2.0)	(1.7)	(1.4)	5	
Other adjustments to cash	16.3	5.7	5.3	4.5	5.1	5.8	6.7	7.3	7.5	7.7		
Free Cash Flow to Firm	**33.4**	**14.5**	**58.0**	**(153.8)**	**(29.0)**	**(126.2)**	**68.4**	**91.3**	**118.3**	**143.3**		
% growth		*(57%)*	*301%*	*(365%)*	*(81%)*	*335%*	*(154%)*	*34%*	*30%*	*21%*		
Free Cash Flow to Firm (excl. acquisitions)	**33.4**	**14.5**	**58.0**	**41.5**	**51.9**	**44.3**	**68.4**	**91.3**	**118.3**	**143.3**	6	***9%***
% growth		*(57%)*	*301%*	*(28%)*	*25%*	*(15%)*	*54%*	*34%*	*30%*	*21%*		

Cumulative Cash Flows to the Firm



Comments

1
- Very **strong EBITDA growth at 24% CAGR** enabled through add-on acquisitions, internal restructuring and organic growth

2
- **D&A growth driven by acquisitions**, which contribute c.$27m to total D&A expense at exit

3
- Maintenance CAPEX is based on forecast PP&E and **grows in line with overall growth of the company** reaching approx. $69m at exit
- Includes additional maintenance capex from the 4 add-on targets which account for 37% of total maintenance CAPEX in 2024

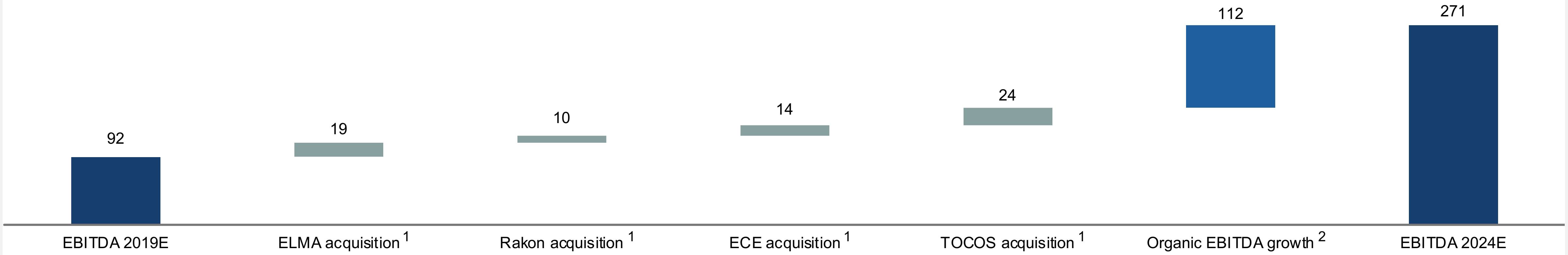
4
- High cash outflows in FY20 – FY22 due to **acquisition of 4 add-on targets amounting to $446.7m**

5
- Working capital needs change from positive to negative during the investment period
- The **CCC first decreases from 38 days in 2019 to 28 days in 2022** and stays constant afterwards

6
- Organic FCFF (excl. acquisitions) is solid despite some minor fluctuations in growth, mainly due to changing working capital needs and maintenance CAPEX
- The **FCFF grows at a CAGR of 9%** over the investment period and reaches **$91.3m at exit**

Strong EBITDA growth based on add-on acquisitions and organic growth

EBITDA bridge



EBITDA 2019E
- The expected EBITDA of $91.5m in 2019 is a result of continued margin improvements through efficiency measures imposed by CTS' management

ELMA acquisition
- ELMA is expected to be acquired in Q4 2020 for an EV/EBITDA multiple of 9.4x
- This acquisition will help CTS strengthen its position in Europe
- ELMA is expected to achieve an EBITDA of $19.2m in 2021
- **Financed with:**
  - c. $40m cash on hand
  - c. $101m ACF

Rakon acquisition
- Rakon is expected to be acquired in Q4 2020 for an EV/EBITDA multiple of 6.5x
- This acquisition will help to expand quickly into new markets and capitalize on growth regions (NZ)
- Rakon is expected to achieve an EBITDA of $10.5m in 2021
- **Financed with:**
  - c. $10m cash on hand
  - c. $44m ACF

ECE acquisition
- ECE is expected to be acquired in Q4 2021 for an EV/EBITDA multiple of 7.8x
- This acquisition will expand CTS' presence in Taiwan and allow for consolidation with existing facilities and units
- The expected EBITDA for 2022 is $13.5m
- **Financed with:**
  - c. $77m cash on hand
  - c. $4m ACF

TOCOS acquisition
- TOCOS will be CTS' last acquisition, which is planned for Q4 2022 for an EV/EBITDA multiple of 8.9x
- It is a further expansion into the strongly growing Asian market
- The target's EBITDA contribution in 2023 is expected to be $24.3m
- **Financed with:**
  - c. $76m cash on hand
  - c. $75m ACF
  - c. $20m equity

Organic EBITDA growth
- The largest amount of EBITDA is contributed by organic EBITDA growth throughout the investment period
- This also includes the EBITDA growth of the add-ons which is achieved through margin improvements implemented by CTS' management

EBITDA 2024E
- The expected EBITDA of $271m in the anticipated exit year is c. 3x the entry EBITDA
- EBITDA development is expected to be mainly driven by organic EBITDA growth
- The significantly improved EBITDA allows for a solid exit in 2024

Notes: 1) Cash EBITDA in year after acquisition including realized synergy effects; 2) Includes EBITDA growth of acquired targets from 2 years after acquisition onwards

02

Exit and Returns

Investment Case

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CTS' internal factors and optimistic end-market prospects allow for rating of Ba2 / BB

Debt market analysis: Comparable transaction

SUNSOURCE — Tier 2 supplier of fluid power and motion control components and service provider for OEMs in the Industrial and Mobile Equipment end-markets.

Acquired by Clayton, Dubilier & Rice in Dec. 2017, transaction terms were undisclosed.

- Sales 2017: **410m**
- Speculated leverage multiple: **5xEBITDA**
- Speculated EBITDA, 2019: **57m**
- Industry: **Industrials**
- Geography: **U.S. and Canada**

Capital IQ debt issuance reported for transaction:

Tranche Type	Maturity	Size	Secured	Spread*	Issued in
ABL Revolver (unrated)	5	50	Yes	375	Dec. 2017
Term Loan B (rated)	7	235	Yes	375	Dec. 2017
Total debt issued for LBO		285			

*bps over LIBOR

Moody's rating for Term Loan at time of transaction:

B2 / B

Starting point for CTS

Rationale behind rating

- Revenue exposure to highly cyclical industrial end markets
- Regional concentration of operations
- A financial policy likely to maintain its financial leverage at around 5x
- Expectations of moderate organic revenue growth and margin expansion
- Stable to modest growth in the company's industrial and energy end markets
- The rating does not anticipate any meaningful debt financed acquisitions or dividends (which would lower the rating) although event risk is high with private equity ownership.

1. Expert opinion - Invesco

- Given current company status (2/3 of sales come from automotive industry), starting point to estimate debt instruments and consequent pricing based on automotive debt market:
  - Max. leverage of **c. 3.5x EBITDA**, which can be increased if there's no significant CAPEX or NWC outflows
  - Debt rating, average: **B2 / B** (congruent with comparable transaction)
- Possible to **issue loans** as opposed to bonds, priced with a **spread of C. 4%** over floating 3-month LIBOR rate
- **Debt should be issued in the U.S.**; amortizing debt is not common in the US **– mainly bullet instruments**
- Only **senior debt** is advisable, **with 1 or 2 tranches**, and an average **maturity of 7 years,** financing costs 6-7% of EV

2. CTS' leverage determinants, B2 starting point

		Impact on rating
Cash flows	1/2 of sales expected to be contractual and predictable	Neutral
Cash flows	No regional concentration, diversified end-markets	Up
Cash flows	Historically volatile free cash flows	Down
Cash flows	No significant expected NWC outflows	Up

		Impact on rating
Assets	High hard fixed assets (land and buildings)	Up
M&A	Expected M&A to be carried out with additional debt	Down
Growth / Market	Diversified end-markets reduce cyclicality exposure	Up
Growth / Market	High growth in end market segments for organic growth	Up

3. CTS' projected debt conditions

Expected rating:
Ba2 / BB

Spreads
320-450 bps

- **Type of debt:** Senior debt, tranches A and B, both secured
- **Additional instruments:** Acquisition Capex Facility (maximum permissible leverage dictated by bank case), replaced by an RCF
- **Maximum leverage:** 4.0x EBITDA – no headroom
- **Average pricing:** LIBOR + 380-450 bps
- **Maturity of debt instruments:** 6-8 years

Sources: Moody's, Capital IQ, Invesco Debt Trading phone call, Pitchbook phone call

Total leverage of 3.9x EBITDA in a single senior loan, priced at LIBOR + 380 bps

Sources of Funds	in $m	% of total	EBITDAx	Pricing
Senior Debt Tranche B	360.0	36%	3.9x	L+380 bps
Total debt	**360.0**	**36%**	**3.9x**	
Subordinated Loan	554.5	56%	3.9x	
Ordinary Equity	76.9	8%	0.5x	
Management Sweet Equity	*11.5*	*1%*	*0.1x*	
Institutional Ords	*65.4*	*7%*	*0.5x*	
Equity Contribution	**631.4**	**64%**	**6.9x**	
Acquisition Credit Facility	*223.3*	*- %*	*-*	*L+420 bps*
Revolver Credit Facility	*150.0*	*- %*	*-*	*L+423 bps*
Total Sources	**991.4**	**100%**	**10.8x**	

Uses of Funds	in $m	% of total
Purchase CTS Equity	1,036.3	105%
Net Debt (Excess Cash)	(131.1)	(13%)
Minimum Operating Cash	38.6	4%
Enterprise Value	**943.8**	**95%**
Financing Fees	14.6	1%
Due diligence fee	*18.88*	
Arrangement fee	*14.16*	
Other Fees and Expenses	33.0	3%
Total Fees	**47.6**	**5%**
Total Uses	**991.4**	**100%**

Evaluated Capital Structures

Instrument	Structure 1	Structure 2	Structure 3	Structure 4
Senor Debt Tranche A	-	50.0	-	-
Senior Debt Tranche B	360.0	300.0	330.0	300.0
Senior Debt Tranche C	-	-	80.0	80.0
Equity Contribution	631.4	641.4	581.4	611.4
Total Sources of Funds	**991.4**	**991.4**	**991.4**	**991.4**
Leverage	*3.9x*	*3.8x*	*4.5x*	*4.2x*
MM at exit	*3.16x*	*3.07x*	*3.19x*	*3.14x*

Comments

- Capital Structure 1 is selected vs Capital Structure 2 as it generates the **highest return with a reasonable leverage level**, in line with the current debt market conditions in the US. Structures 3 and 4 over leverage limits
- A **smaller equity injection is needed under this capital structure**, which drives returns upwards
- There will not be rollover equity from management due to **their small equity stake in the firm at entry**

Comments

Uses of funds

- **Total uses of funds, amounting to $991.4m,** are to be paid for the **EV of $943.8m**, **financing fees of $14.6m** and **other fees** related to the acquisition of **$33.0m**
- The **EV** is based on an entry multiple of **10.3x EBITDA**, explained in the valuation section
- CTS' excess cash is reduced by a **minimum operating cash balance of $38.6m**, which is required for CTS' operations and therefore added in the net debt calculation[2]

Sources of funds

- Total funds are sourced from an **equity contribution of 6.9x EBITDA** ($631.4m) and **leverage of 3.9x EBITDA** ($360.0m)
- Total debt is composed of **a single Tranche B senior debt, of $360m**. It is contracted in US dollars and is non-amortizing, as is customary in the United States. The basis for the capital structure was Invesco's professional advice
- The equity strip consists of a **subordinated loan of $554.5m** and **ordinary equity of $76.9m**
- Top management's **sweet equity contribution of $11.5m** is twice their combined yearly salary and based on a 15:85 ratio

Additional debt instruments

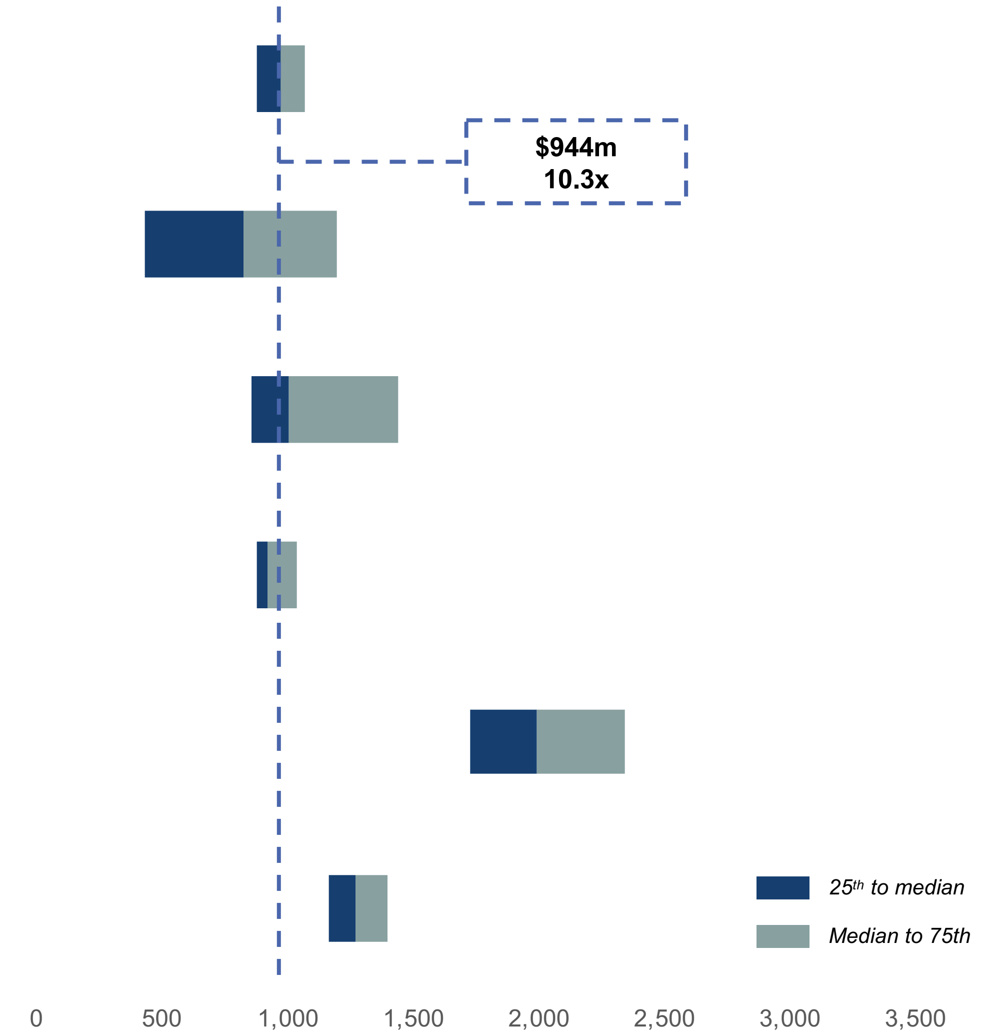
- An **Acquisition Credit Facility with a $223.3m size** will be used to partially finance the projected acquisitions, with drawdown limits based on bank case leverage covenants
- If liquidity issues arise, there will be a **Revolver Credit Facility, with $150m size**. However, on an investment case, such facility is not expected to be used

Notes: 1) Refers to the size of the facility. However, these facilities are not being used for the acquisition of CTS' Corp; 2) Calculated as the average NWC needs of the last 10y

Sources: Invesco Debt Trading phone call

The different methodologies suggest an EV of $944m and a 10.2x EV/EBITDA multiple

Enterprise Value (in $m)



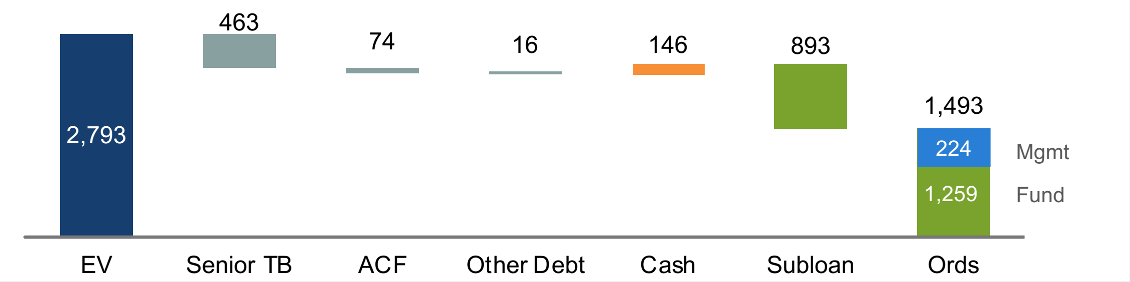
Methodology	EV/EBITDA multiple	Comments
Trading comps	**10.7x** 9.4x – 12.1x	• Comparable companies were selected based on input received from CTS' CFO and have similar business models and end markets • The minimum EV/EBITDA multiple of the peer group was 7.6x while the maximum was 14.3x
Precedent transactions	**9.0x** 4.7x – 13.1x	• Precedent transactions were selected from the industrials sector with an announcement date within the last 6 months • The recent transactions have some extreme outliers with multiples ranging from 1.9x to 38.8x
10-year cycle multiples	**11.2x** 9.0x – 13.5x	• The 2017 median EV/EBITDA multiple of comparable companies of 12.8x was the highest over the 10-year period from 2009 until 2018 • Multiples are generally increasing, although most 2018 multiples are lower than 2017 multiples
Share price premium	**9.7x** 9.2x – 10.9x	• The share prices 1 day, 1 week and 1 month prior to acquisition date of recent transactions are analyzed • The average premium is then applied to CTS' share price resulting in a relatively small range from 25th to 75th percentile
DCF I Gordon growth method[1]	**21.8x**	• The DCF valuation with the Gordon growth method is performed using terminal growth rates ranging from 0.5% to 1.5% • Despite these conservative rates between historical GDP growth rates and inflation rates, this method yields the largest value
DCF II Exit multiple method[1]	**13.8x**	• The second DCF is based on an exit multiple of 9.7x – 10.7x for the calculation of the terminal value • The chosen discount rate (cost of equity) ranges from 8.3% to 9.5% and is based on a re-levered beta of 1.05

Notes: 1) 25th and 75th percentiles not actual percentiles but range of changing input assumptions

Summary of valuations in Appendix IX

The model predicts an attractive 3.1x MM and an IRR of 26% for the the fund[1]

Exit Waterfall (in $m)



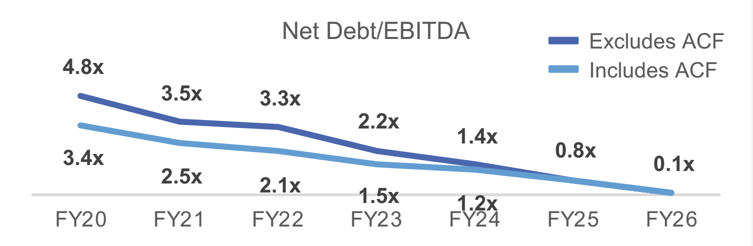
- The **exit is planned for 2024** after an investment period of 5 years and no multiple arbitrage is assumed leading to an exit EV / EBITDA multiple of 10.3x
- The exit EBITDA is forecasted to be approx. $271m leading to an **EV** of **$2,793m** at exit
- The **Equity Value at exit** is expected to be **$2,386m**, implying a **3.1x MM and an IRR of 26%** (fund)

Institutional & Management Returns

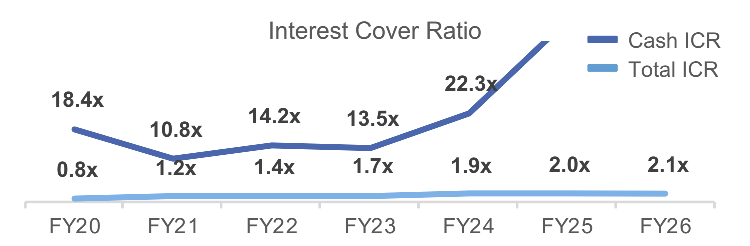
Returns	FY20	FY21	FY22	FY23	FY24	FY25	FY26
Management Exit Proceeds	-	4.4	24.2	82.6	223.9	285.7	337.0
Management Equity	11.5	11.5	11.5	11.5	11.5	11.5	11.5
Management MM Returns	**0.0x**	**0.4x**	**2.1x**	**7.2x**	**19.4x**	**24.8x**	**29.2x**
Management IRR	**NA**	**-38%**	**28%**	**64%**	**81%**	**71%**	**62%**
Institutional Investor Exit Proceeds	609.9	959.6	1,252.3	1,830.5	2,161.8	2,601.0	2,990.2
Institutional Investor Money Equity	687.5	687.5	687.5	687.5	687.5	687.5	687.5
Institutional MM Returns	**0.9x**	**1.4x**	**1.8x**	**2.7x**	**3.1x**	**3.8x**	**4.3x**
Institutional Investor IRR	**-11%**	**18%**	**22%**	**28%**	**26%**	**25%**	**23%**

- In the anticipated exit year, 2024, **management** receives proceeds of **$223.9m** achieving a **MM of 19.4x** and an **IRR of 81%.** To this return, vesting rules have already been applied
- The **institutional investor** receives **$2,161.8m** achieving a **MM of 3.1x** and an **IRR of 26%**[1]

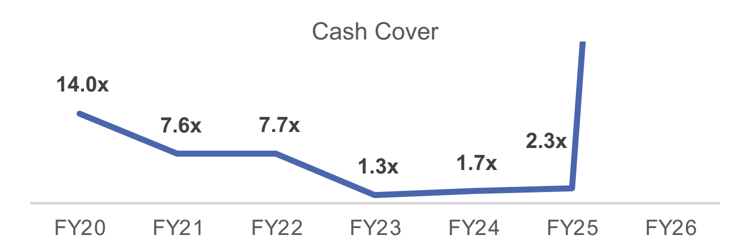
Credit Statistics



- **Net Debt / EBITDA** is decreasing over the investment period to **1.2x** in the anticipated **exit year** (1.4x including the ACF)
- The **driving factor** for this decrease is the strongly increasing **EBITDA** and not Net Debt, which is also growing



- Due to the lack of amortizing debt, the cash interest cover remains over 10.8x over the entire investment. Total interest cover is above 1x in FY21, with an increasing trend
- Again, strong **EBITDA growth** is the main driver for the increase



- The **significant drop in cash cover** is mainly **caused** by the **repayment period** of the ACF from 2023-2025
- However, the **cash cover** remains above the covenant of 1.0x during the investment period

Notes: 1) Initial equity over which returns are calculated includes an equity injection of $20.0m in FY22 for the acquisition of TOCOS (injection is assumed to be 100% with the sub loan, not affecting nor diluting management's sweet equity stake)

Returns in the investment case are robust and most sensitive to the exit year

Bank case[1]

MM assumig 10.3x entry multiple

		Exit year				
		2022	2023	2024	2025	2026
Exit multiple	9.3x	1.2x	1.5x	1.8x	2.2x	2.5x
	9.8x	1.3x	1.6x	1.9x	2.3x	2.6x
	10.3x	1.4x	1.7x	2.0x	2.4x	2.7x
	10.8x	1.5x	1.8x	2.1x	2.5x	2.8x
	11.3x	1.6x	1.9x	2.2x	2.6x	3.0x

IRR assumig 10.3x entry multiple

		Exit year				
		2022	2023	2024	2025	2026
Exit multiple	9.3x	7%	11%	13%	14%	14%
	9.8x	10%	13%	14%	15%	15%
	10.3x	12%	14%	15%	16%	15%
	10.8x	15%	16%	16%	17%	16%
	11.3x	17%	18%	17%	17%	17%

IRR assumig 10.3x entry multiple

		Equity injection in $m				
		10.0	15.0	20.0	25.0	30.0
Exit multiple	9.3x	13%	13%	13%	12%	12%
	9.8x	14%	14%	14%	14%	14%
	10.3x	15%	15%	15%	15%	15%
	10.8x	17%	16%	16%	16%	16%
	11.3x	18%	18%	17%	17%	17%

Base case[1]

MM assumig 10.3x entry multiple

		Exit year				
		2022	2023	2024	2025	2026
Exit multiple	9.3x	1.2x	1.9x	2.2x	2.7x	3.1x
	9.8x	1.3x	2.0x	2.4x	2.8x	3.3x
	10.3x	1.4x	2.1x	2.5x	3.0x	3.4x
	10.8x	1.6x	2.3x	2.6x	3.1x	3.6x
	11.3x	1.7x	2.4x	2.8x	3.3x	3.7x

IRR assumig 10.3x entry multiple

		Exit year				
		2022	2023	2024	2025	2026
Exit multiple	9.3x	7%	17%	17%	18%	18%
	9.8x	10%	19%	19%	19%	18%
	10.3x	13%	21%	20%	20%	19%
	10.8x	16%	22%	21%	21%	20%
	11.3x	18%	24%	23%	22%	21%

IRR assumig 10.3x entry multiple

		Equity injection in $m				
		10.0	15.0	20.0	25.0	30.0
Exit multiple	9.3x	18%	18%	17%	17%	17%
	9.8x	19%	19%	19%	19%	18%
	10.3x	20%	20%	20%	20%	20%
	10.8x	22%	21%	21%	21%	21%
	11.3x	23%	23%	23%	22%	22%

Investment case

MM assumig 10.3x entry multiple

		Exit year				
		2022	2023	2024	2025	2026
Exit multiple	9.3x	1.6x	2.3x	2.8x	3.4x	3.9x
	9.8x	1.7x	2.5x	3.0x	3.6x	4.1x
	10.3x	1.8x	2.7x	3.1x	3.8x	4.3x
	10.8x	1.9x	2.8x	3.3x	4.0x	4.5x
	11.3x	2.1x	3.0x	3.5x	4.2x	4.8x

IRR assumig 10.3x entry multiple

		Exit year				
		2022	2023	2024	2025	2026
Exit multiple	9.3x	16%	24%	23%	23%	22%
	9.8x	19%	26%	24%	24%	23%
	10.3x	22%	28%	26%	25%	23%
	10.8x	25%	30%	27%	26%	24%
	11.3x	28%	31%	28%	27%	25%

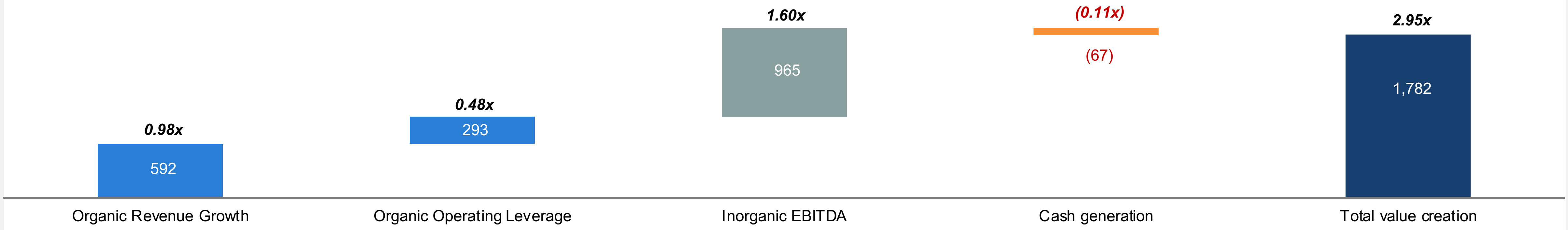
IRR assumig 10.3x entry multiple

		Equity injection in $m				
		10.0	15.0	20.0	25.0	30.0
Exit multiple	9.3x	23%	23%	23%	23%	23%
	9.8x	25%	25%	24%	24%	24%
	10.3x	26%	26%	26%	26%	25%
	10.8x	27%	27%	27%	27%	27%
	11.3x	29%	28%	28%	28%	28%

Notes: 1) Includes $20.0m equity injection leading to lower returns than under defined case assumptions (usually no equity injection needed)

Strong value creation mainly based on inorganic EBITDA and organic revenue growth

Return Breakdown (in $m)



- Organic revenue growth is expected to contribute **$592m** (33%) to total value creation
- It is mainly achieved by:
  - Increased sales efforts in APAC and Europe
  - Diversification towards Aerospace & Defense and Telecom & IT
  - Increased focus on fast-growing sectors through R&D investments
- Organic revenues grow from **$476m at entry to $774m at exit**

- **EBITDA margin** improvements at an organic level are expected to create **$293m** (16%)
- During the investment period, **organic EBITDA margin increases by 370bps**
- This growth is enabled through **internal restructuring:**
  - Relocation of production facilities to low-cost areas (e.g. Czech Republic)
  - Implementation of ERP systems to increase efficiencies
  - Implementation of technical training programs for salespeople

- **Inorganic EBITDA** is expected to be the largest driver for returns creating **$965m** (54%)
- As previously shown in the EBITDA bridge, a total of c.$67m of EBITDA will be acquired during the investment period
- The acquired EBITDA is significantly grown after integration of the business
- A significant portion of the value creation also stems from the **multiple uplift** of the targets achieved through synergies and multiple arbitrage[1]

- Cash generation has a **negative contribution** to the total value creation
- It decreases total value creation by **$67m** or a 0.11x MM
- This is a **result of the large cash outflows from the M&A activity.**
- Cash on hand and an acquisition credit facility are used for the acquisitions. **Both increase the company's net debt**

- The total value created during the investment period is expected to be **$1,782m,** corresponding to a 2.95x MM

Organic impact *Inorganic impact* *Cash*

03

Exit Strategy

NOVA SCHOOL OF BUSINESS & ECONOMICS

A trade sale is the favored exit and a high interest is expected across all segments

	Trade sale	Secondary sale	IPO	Sale in parts
Pros	✓ Highly fragmented market with significant consolidation activity, ensuring numerous interested buyers and a competitive process ✓ Many larger and more diversified players in the market that would have the financial resources to acquire CTS ✓ Significant synergy opportunities likely to lead to higher exit valuations	✓ PE activity currently at a very high level with a record level of dry powder of $2.0tr in 2018 ✓ Majority of dry powder is held in youngest funds (<2 years) indicating potentially high levels of dry powder ready to be invested in 2024 ✓ CTS has a high growth potential with healthy cash flows making it an attractive buyout target ✓ Usually the fastest process	✓ An IPO would give CTS access to a larger market than the other exit strategies and would therefore eliminate the theoretical burden to find buyers ✓ If public market conditions are favorable, this exit strategy will most certainly yield the highest returns	✓ Possibility of several buyers with interest in only one or two of CTS' business lines as opposed to the entire business ✓ Highly attractive business units (e.g. Sense) might benefit from multiple arbitrage when valued in isolation
Cons	× Potentially slower process than a secondary sale	× Strong interest expected from strategic buyers potentially leading to unattractive entry valuations from a PE perspective	× IPOs are usually more expensive, and the timing is also uncertain as it depends on capital market conditions × The ongoing uncertainty of capital markets imposes an undesired degree of risk for this alternative reducing the probability of achieving high returns on the exit	× Loss of synergies between business units leading to reduced efficiencies × Longer process and more difficult to find the right buyers × Involvement in exit of one business unit might distract management from continued value creation in other units
Potential buyers	Tier 1: Amphenol, Methode Electronics, Sensata Technologies, TE Tier 2: Bosch, Coherent, Delphi Technologies, FLIR, fabrinet, Hella, Novanta, TDK	EQT, Equistone, Warburg Pincus	NYSE	First Sensor, KEMET, Stoneridge, Vishay Precision Group

Sources: Broker reports, press research

Four peers are expected to show particularly strong interest in CTS

Potential strategic buyers – Tier 1

Name	Country	Ownership	Sales '18 ($m)	EBITDA '18 ($m)	Net debt / EBITDA '18	Firepower	Description	M&A deals (last 10 years)	Comments	Overall assessment
Amphenol		Listed	6,952	1,691	1.9x	●	• Engages in design, manufacture and marketing of interconnect products • It serves the following end markets: military, commercial aerospace, industrial, automotive, mobile devices, IT & Datacom, mobile networks and broadband	26	• Very high overlap of end markets making CTS a very attractive target to increase market position • Strong financial profile and a solid acquisition history	●
Methode Electronics		Listed	1,000	166	1.8x	◑	• Engages in the manufacture of component and subsystem devices • It serves the following end markets: automotive, transportation, heavy industry, consumer & commercial, military & aerospace, alternative & renewable energy, communications and healthcare	4	• A close competitor in terms of end markets served and currently approx. twice as large as CTS • High interest expected as means to compete with significantly larger players	◕
Sensata Technologies		Listed	3,522	908	3.8x	◕	• Manufactures electromechanical, electronic sensors or controls • It serves a large number of end markets including: aerospace & defence, agriculture, automotive, commercial truck & trailer, construction, energy, HVAC, industrial, marine, material handling, medical, telecom and more	8	• Currently very strong market position • High overlap of end markets making CTS an attractive add-on target	●
TE		Listed	13,988	3,150	1.3x	●	• Engages in the design and manufacture of connectivity and sensors solutions • It serves a large number of end markets including: aerospace, appliances, automation & control, automotive, autosport, communications & wireless equipment, connected home, consumer solutions, data centers, defense & military and more	22	• Very strong financial position and acquisition history • Large and diversified player with focus on sensor solutions • CTS' increased focus on sensors and high degree of innovation make it a natural target	●

Sources: Company information, Mergermarket, press research

Validation of commercial and financial aspects is crucial to proceed with transaction

	Area	Key focus aspects	Potential red flags	Relevance
Commercial	**Market growth & trends**	• Analysis of real strength of major trends during the next 6 years • Special focus on APAC region, Telecom and Defense markets	► Recession risk significantly marking down forecasts, affecting sales ► Overestimation of positive outlook in key markets or high entry barriers	■■■□□
Commercial	**Customers relationships**	• Deep dive into contracts celebrated with top customers • Recognition among customers for reliability, quality, and service	► Impossibility to negotiate contracts with volume and tenure agreements ► Considerable number of dissatisfied large clients	■■⬓□□
Commercial	**M&A targets**	• Full diligence on selected acquisition targets • Special focus on margins, growth prospects, and synergies	► Low operating margins cannot be corrected through synergies ► Little realistically realizable synergies and/or difficult integration	■■■■■
Commercial	**Competitive position**	• Broad and detailed analysis of competitors per product line & location • Examination of IP position and patents relevance and duration	► Weak positioning with customer-engineered products ► Loss of key patents without prospect of acquiring new ones	■■■■□
Commercial	**Sales force effectiveness**	• Evaluation of commercial taskforce's competence to attract and close contracts with key market players	► Unrealistic views about salespeople's abilities to negotiate and attract large customers, gain market share	■■■■⬓
Financial	**Financial reporting**	• Deep analysis of nature behind high cash flows from long term debt • Fair value assessment and reporting of intangible assets • Reporting of restructuring charges as "non-recurring" for normalization	► Fraud, material misstatements, ??? ► Overestimation of intangible assets, namely client lists/relationships ► Overestimation of normalized EBITDA if charges are indeed recurring	■■■■■
Financial	**Fixed asset optimization**	• Appraisal of facilities utilisation rates and capacity to allow for growth • Evaluation of ownership status vs. sale and leaseback strategy	► Inability to consolidate manufacturing in low-cost geographies ► Maximum capacity attained, making accelerated growth unfeasible	■■□□□
Oper.	**R&D capabilities**	• R&D capacity to leverage market trends in a timely manner • Evaluation of R&D's actual role as a driver for recurring revenues	► Not enough R&D capabilities to quickly innovate, diversify product portfolio and exploit emerging trends before competitors	■■■⬓□
Oper.	**ERP systems**	• Appraisal of ERP system implementation success regarding increased efficiencies and overhead reduced costs	► ERP system implementation generates more costs in the short term than short term efficiency benefits	■⬓□□□
Legal	**Pension plans**	• Evaluation of pending pension plan payments, possible future settlements	► Large pension plan settlements in near future or material expected losses from pension funds	■■■□□
Legal	**ESG and insurance**	• Assessment of compliance with environmental policies • Insurance coverage (natural disasters, non-ESG-compliance)	► Not existent proactive ESG actions, leading to possible litigations ► Inappropriate insurance policy or coverage, risking high cash outflows	■■■□□

04

Personal Reflection

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Reflection on skills attained before and during the work project

Skills gained through development of work project

Developing my Master's thesis under the Private Equity Challenge format was a tremendous opportunity for me as it allowed me to gain very practical skills in the area of finance where I intend to pursue my post-graduate career.

I learned to perform a holistic analysis of a company and develop an investment thesis in order to create significant value. Furthermore, performing several valuation techniques, developing an entire business plan and creating an exit strategy significantly ameliorated my understanding of strategy and finance.

Throughout the entire project, I was faced with very real and complex problems and had to apply my analytical thinking and problem solving skills in order to find solutions. This was a great experience as it allowed me to use the my practical experiences gained in previous internships in investment banking. Also, this project allowed me to build an entire LBO model from scratch, together with my teammate Natalia. In my opinion, this is a very valuable experience which taught me a lot and allowed me to do tasks I would not have been able to do in a normal internship and at most other universities.

I believe this particular format of the Master's thesis taught me several practical skills that will be very useful for my career start. As my long-term career plan is to work for an internationally leading private equity firm, I am particularly thankful for this opportunity. I was able to perform the real tasks of a private equity professional under real-life conditions and believe this added great value to my personal development.

Skills attained during Master's degree

The Master's in Finance at Nova School of Business and Economics is in my opinion very practice oriented which adds great value and truly prepares oneself for the career start.

A large part of the work consists of cases and group projects which helps to develop the necessary soft skills not only to have a great chance in the job market and get the desired job, but also to perform well and build a solid basis for a great international career. I felt challenged with regards to both work load and content which is in my opinion a very real resemblance of an Analyst position. I was able to enhance my analytical thinking, my presentation skills and my ability to work output driven in a team. Moreover, courses such as Corporate Finance, Investments, Financial Modelling and Private Equity really helped me to prepare for interviews and the resulting internship in the M&A team at Rothschild.

Overall, I truly believe this Master program has taught me very useful skills and prepared me well for the future. It has further widened my horizon and I am happy to have chosen this program.