

DATA I/O (DAIO)
BY AVI FISHER,
CIO, LONG CAST ADVISERS

Data I/O (ticker: DAIO) is a small cap company with \$41M mkt cap and \$19M in net cash, leading to a total enterprise value of ~\$22M. The company makes capital equipment for the tail end “packaging and handling” portion of the semiconductor cycle so sales are lumpy and cyclical, two attributes (among others) that contribute to an unattractive base case scenario. However, innovation, changing customer needs, management capability and a valuation that assumes “business as usual” make this a very compelling long-term investment.

Recent results still orbit around a blowout 2017, when sales and profitability peaked at \$34M and \$5.6M. 2018 comps have expectedly declined; through 3Q18 trailing 12-mos revs were \$29M and EBITDA \$3.1M, down 9% and 39%. In our analysis we consider 2016, with \$23M and \$2M of sales and EBITDA, as the comparable baseline.

The stock will not screen for value. At ~\$4.80 per share, it trades for 9x annualized '18 EBITDA. However, the company is “over spending” on R&D by roughly \$1.2M / year – a small team of people – to fund development of a security platform called “SentriX” (we’ll circle back on this later). Normalize R&D by adding back \$300k / quarter – just the incremental spend above long term “normal” R&D rates - and this is trading at 5x EBITDA. We think it’s an attractive valuation for a well-run business that is lapping negative comps and on the cusp of potentially material changes.

							FY18			'12-'18
	FY12	FY13	FY14	FY15	FY16	FY17	TTM	9M18	Annld '18	MEDIAN
Sales	17,085	18,717	21,924	22,017	23,413	34,051	29,462	21,366	28,488	
Gross profit	8,638	9,510	11,825	11,544	12,868	20,059	17,516	12,783	17,044	
R&D	5,564	4,586	4,708	4,701	5,065	6,896	7,316	5,550	7,400	
SG&A	7,450	6,378	5,997	5,850	6,376	8,116	8,055	6,239	8,319	
D&A	1,265	613	593	542	602	822	924	736	981	
EBITDA	(3,111)	(841)	1,713	1,535	2,029	5,869	3,069	1,730	2,307	
EBITDA ex R&D	2,453	3,745	6,421	6,236	7,094	12,765	10,385	7,280	9,707	
% EBITDA margin	-18%	-4%	8%	7%	9%	17%	10%	8%	8%	
EV / Sales	1.3x	0.2x	0.4x	0.8x	0.5x	1.9x	0.7x	1.0x	0.8x	0.8x
EV / GP	2.5x	0.3x	0.7x	1.5x	0.8x	3.3x	1.2x	1.7x	1.3x	1.3x
EV / EBITDA	-6.9x	-3.8x	5.0x	11.0x	5.3x	11.2x	7.0x	12.5x	9.4x	7.0x
EV / EBITDA ex R&D	8.7x	0.8x	1.3x	2.7x	1.5x	5.2x	2.1x	3.0x	2.2x	2.2x
	FY12	FY13	FY14	FY15	FY16	FY17	@ 3Q18			
Price basis (avg or current)	\$4.00	\$1.75	\$2.25	\$3.50	\$2.75	\$10.00	\$4.80			
Shares	7,995	7,767	7,948	8,054	8,132	8,436	8,439			
Mkt cap	31,980	13,592	17,883	28,189	22,363	84,360	40,507			
Net debt / (cash)	(10,528)	(10,426)	(9,361)	(11,268)	(11,571)	(18,541)	(18,902)			
EV	21,452	3,166	8,522	16,921	10,792	65,819	21,605			

DAIO makes and sells [automated handlers, ie capital equipment to program microchips and microcontrollers](#). If you studied programming or electrical engineering you likely at some point had to program a chip, probably using some small tabletop device. If you did not, just know that every digital device has within it a microcontroller that is programmed with firmware, including the BIOS that “wakes the chip up”, tells it “you’re a chip” and enables the chip to accept future commands. Chip programming is an essential gateway in a chip’s life.

A few things worth noting here: Chip programming is a mature industry. Chips have been around for a long time, chip programming has been around a long time and equipment for programming chips has been around for a long time. An ex-CEO of a small electronics company – ie a buyer of programmed chips – told me this about the chip programming industry:

“It’s very simple to load application programs into micro controllers at scale. It’s been done for 40 plus years since microcontrollers came to market. There is nothing new or difficult here. This is old old old undifferentiated stuff you are exploring. Good if it’s just personal curiosity. Irrelevant to contemporary trends and issues.”




































We have no doubt this is a smart view from an executive who has since returned to academia.

But we have a slightly differentiated take. First, chip programming is a gateway function; though methods of programming can change, the need to program will not, so there’s something overlooked but essential about this business. Second, while this is indeed a mature industry it remains fragmented. There are a variety of reasons for this but one that jumps out is that products are perceived as undifferentiated and customers are price sensitive, so there’s been limited R&D investment in the space.

However, we see a high probability that increases in chip density and chip content as well as required improvements in chip security will require new investment in chip programming, raising the “innovation barrier” and putting space between leaders and laggards. DAIO is at the forefront of some of these changes and one of the few investing in it.

DAIO’s customers fall into three general buckets: Electronics distributors who offer programming as an upsell; programming centers that offer outsourced programming as a service to assemblers; and contract manufacturers that source, distribute, program and assemble electronics.

These customers buy DAIO capital equipment at avg price of ~\$500k / unit and use them to program chips to their customer’s specs. Annual software and maintenance fees run ~10% of the initial price in. Below is a summary of customers who use DAIO programmers.

Sample Customers		
Automotive	Wireless	IoT/ Industrial/Consumer
         	  	            
Programming Centers and EMS		
        		

CEO Anthony Ambrose took over in 2012 restructured, cut costs, invested in upgrading machines and focused the sales efforts on the niche automotive market, which is seeing growth in chips per car and data per chip. The P&L under his tenure shows a steady progression of improving sales and BVPS while reducing (and holding) SG&A to below 30% of sales. Concurrently, they’ve been self-funding R&D and managing a very conservative balance sheet.

2017 saw a robust year – selling nearly two years of equipment in one - as suppliers to the automobile industry re-tooled and upgraded to better, faster and more reliable equipment for chip programming. DAIO grew market share and installed base, which concurrently supports higher recurring revenues. The company seems to be putting some distance between itself and its competitors.

Last year could have been a random blip or it could have been the result of a well-articulated, well-executed and well-implemented strategy. Either way 2018 comps are impossible. The baseline view is that customers face a digestion period and a long trough lies ahead. Perhaps. But we look at DAIO’s working capital management during 2017 – working capital management is hardly random - as evidence of a strong executive team, an essential components to a successful small company investment.

Despite a stretched supply chain and a demanding order cycle, DAIO thrived and now has a cash horde that’s funding both continued R&D for “SentriX” and a recently announced \$2M share buyback (5% of the outstanding shares). Without any guess on possible futures, \$20M EV seems cheap simply for terrific management that solves an essential problem in a potentially consolidating industry.

Now let’s consider the future: So what is “SentriX”?

Currently, when chips are protected (and often they are not) there is a separate external HSM (Hardware Security Module) on the motherboard protecting and authenticating the chip, like a guard dog outside a house.

There is an effort in the semi-conductor industry to install security directly onto the chip itself. The term for this in engineering circles is “Embedded Trust” or “Root of Trust”. By using the same cryptographic tools used in securing communications (public and private keys, certificates, validation and other forms of authentication) and programming that into the chip, “Root of Trust” would ensure hardware authenticity, so manufacturers can better control their product and customers know they’re not getting fake, useless and potentially corrupted chips.

There is wide agreement in computer security circles that an IoT world where connected chips are ubiquitous will require some level of hardware authenticity. The question is price.

Industries that already require higher levels of security *and* are willing to pay for it (military, finance and medical devices) have begun to adopt some “Embedded Trust” features. The industry-wide issue is bringing the technology to market at scale and at a reasonable cost for consumer electronics adoption. My sense from speaking with sources in the industry, (including others trying to crack this problem who admire the steps DAIO is taking), is that by order of magnitude, the military will pay \$1.50 more for a \$0.25 chip with security, finance \$1, medical devices \$0.75 but for consumer electronics adoption, costs need to breach \$0.50 per chip. Regulations requiring “Root of Trust” security may be required for consumer adoption but it seems reasonable to expect that it is only a matter of time.

DAIO management is approaching this entire problem in a novel and fascinating way.

Under the brand “SentriX” they are partnering with firms that offer security related IP, exclusively licensing the IP, packaging the IP + their programmer as a platform, then giving (gratis, for free) the machine to the customer and charging a per unit price for each securely programmed chip, sharing the revenue with the IP provider.

This solution solves problems and creates opportunities up and down the company's ecosystem. I'll note a few here.

- DAIO's customers (electronics distributors, programming centers and contract manufacturers) can offer a secure upsell with zero capital at risk.
- Since DAIO is an essential gateway in marketing their technology, the IP partners are incentivized to help DAIO expand their footprint. To this point, it's worth noting that one of DAIO's first IP partners, [SecureThingz, was acquired by IAR Systems](#) for \$30M, on \$500k of revenues. This indicates the perceived value in the IP. Plus, if IAR wants a return on their investment, they need increased “SentriX” distribution.
- Getting more machines on more customer floors will put even more space between DAIO and its competitors. It appears to be the only programmer doing this at a scale at this moment.
- The effort enables DAIO to transition from being a piece of equipment sold, to a platform that holds the keys (cryptographic and proverbial) towards an expanding technology.
- It would also enable DAIO to transition away from the cyclicity of capital goods spending towards more consistent and recurring revenues. This would offer visibility, which tends to justify higher valuation multiples.
- Most important, the willingness to try something new and different reflects the quality of the grey matter managing this ~\$20M EV company.

In short, if SentriX works, we think in 3-5 years this could be a substantially larger and different company, not a capital equipment maker but a secure hardware platform.

DAIO has long signaled that 2018 is a market development year for SentriX. At 3Q18, it had 4 SentriX machines deployed but they are under-utilized. Consider an initial program with 10 machines producing 1M chips / year. At 10M chips and \$0.25 / chip, this is \$2.5M of incremental pre-tax profit. (The company has \$13M of NOL's remaining). This is all conjecture since the company does not disclose its expected revenue / chip but it provides a sense of what an initial ramp could look like.

Possibly, the machines will never be used, SentriX could fail, and the company would cut back the R&D spend and suddenly you're paying 5x EBITDA for a company in a niche fragmented industry benefitting from secular tailwinds (more chips, more info on chips), and that has shown more than once that it can separate itself from the pack and drive innovation.

The bear case, is that this is a fair to middling business in a fragmented industry using technology that's been around for 40+ years. Key risks of course are competition and new technologies that change the way chips are programmed.

We see the baseline “unattractive and irrelevant” as both attractive and relevant because it discounts changes in the industry and ignores management capabilities. This company is small and focused and winning in an industry perceived as undifferentiated and unimportant. With the benefit of a continuing upgrade cycle and technology evolution, we believe it has the opportunity to continue turn itself into something more relevant and more valuable over time.

-- END --