

Ambarella (AMBA) \$115.00

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Ambarella has attracted a number of Wall Street analysts and retail investors. The company has exposure to a number of companies and trends that Wall Street is quick to rate higher and higher. While management is not to blame for the exuberance, shares have reached a level that almost no company manages to maintain over the long haul: an enterprise to sales ratio of more than 10x. Dichotomy believes that as investors wake up to the risks with the current valuation and the risks of a concentrated customer base, Ambarella will re-rate lower.

<b>Ticker:</b>	<b>AMBA</b>	<b>Current Price:</b>	<b>\$115.00</b>
<b>Action:</b>	Short	FD Market Cap (M)	\$3,849
<b>Expected Timeframe:</b>	0.5-2 years	Enterprise Value(M):	\$3,614
<b>Target Allocation</b>	1-2%	Target Price:	\$50.00
<b>Asset Class:</b>	Common Equity		

**Investment Overview/Background**

Ambarella is a fabless system-on-a-chip (SoC) designer that focuses on video processing. Their chips are deployed into areas such as security cameras, automotive cameras, wearable/sport cameras, and infrastructure cameras. The chips, market segments, and image processing capabilities can be found below.

Table 1. SoC Offering from Ambarella Source: [2015 10K](#)

	<b>Chip</b>	<b>Node</b>	<b>Quality</b>
Infrastructure broadcast encoders, transcoders	A6	65nm	1080p60
	A8	32nm	1080p60
Wearable, Sports, flying cameras	A2S	65nm	1080p30
	A5S	45nm	1080p30
	A7L	32nm	1080p60
	A9	32nm	4KUltraHD
	A12W	28nm	1080p60
	H1	28nm	4KUltraHD
Automotive Cameras	A2S	65nm	1080p30
	A5S	45nm	1080p30
	B5		
	A7LA	32nm	1080p30
	A9	32nm	Surround View
IP Security Cameras	A12A	28nm	Dual 1080p30
	A5S	45nm	1080p30

	S2	32nm	4kp30
	S2L	28nm	1080p60
	S3	28nm	4KUltraHD

Ambarella sales are concentrated and their top five largest customers collectively account for 64% of total revenue. Their largest customer was GoPro, with an estimated 32% of their FY 2015 revenue (\$76.4 million with an ASP of \$14.70). Ambarella has thus far dominated the high-end imaging chip market.

Right now, Wall Street loves the potential of Ambarella, and the valuation reflects this love. Currently Ambarella sports a 76x price-to-earnings ratio and a 16.5x enterprise value-to-sales multiple when looking at 2015 figures.

### You Don't Know What You Don't Know

There are a number of looming threats for Ambarella. Here is what is known: Ambarella has a valuation that assumes near perpetual growth at the same margins enjoyed only over the past few years. On the flipside, here is what the bulls don't know: whether GoPro will diversify their chip manufacturers, whether a larger company will start producing similar products, and whether history will repeat itself.

Starting with the initial problem, GoPro is a massive portion of their sales, an estimated 32% during 2014. Right now GoPro is using only Ambarella for their image processing chips. With Ambarella's valuation, it is basically assumed that GoPro will not only keep using Ambarella exclusively, but GoPro will continue to grow at astronomical rates. While a discussion of why shorting GoPro is outside the scope of this report, there are a number of [reputable](#) short sellers who believe that GoPro is an attractive short. Ignoring the potential overvaluation of GoPro (a manufacturer of a product that may likely be a fad), GoPro is incentivized to diversify their suppliers.

It is unlikely that any business would keep a single supplier for a critical component, unless forced to. Black swans exist and it would be foolish for GoPro to keep only Ambarella as a supplier. In a call I had with GoPro management, it was confirmed that "are always looking to new suppliers" and "other chip manufacturers are out there". Perhaps most [interesting](#)/coincidental, GoPro's CFO, Jack Lazar, was the former CFO of Athero's. Athero's was acquired by Qualcomm. Qualcomm's Snapdragon chip is [rapidly](#) increasing image [processing](#) capabilities. Could a Snapdragon chip be the next chip in GoPro camera's? Time will tell.

Whether or not Qualcomm directly competes with Ambarella is not the main point. Ambarella has competition and will continue to face more competition. Ambarella is not fighting small, no name companies. They are going up against massive companies chasing market share in any way possible. This includes Qualcomm, Intel, Texas Instruments, and a slew of other competitors.

A shift and sharp change can happen in other ways too. Bulls of Ambarella would be wise to examine the company's history to see just how fast change can occur. In their 2014 [10-K](#), Ambarella warns investors of this sudden change. "For example, our largest OEM end customer in 2011, Eastman Kodak Company, or Kodak, closed its camera division in January 2012." While I am not suggesting that GoPro will close overnight, change happens rapidly and a premium valuation is only deserved when cash flows can be extrapolated for a number of years into the future, not just a few years at best.

Other markets that excite bulls of Ambarella include drones, cop-cams, and security cameras. There are a number of misconceptions about these end markets that detract from any sensible bullishness. For example, it is [believed](#) that Ambarella's chips are the "brains" behind drones. This is patently false. Ambarella's chips provide the image processing for cameras that can attach to the drones, like GoPro's for instance. The actual chips that power drones are the same ones that power computers: Intel and AMD processors.

Regarding security cameras, Ambarella [cater's](#) to higher end cameras, 1080p and Ultra HD in particular. There are several processors out there that can handle the higher-end [demands](#). Furthermore, it seems unlikely that every single security camera user would need Ultra HD for their camera. For many customers, simpler formats such as 720p will suffice. Indeed, most of the most popular security cameras on Amazon (that aren't fakes) are 720p. If 1080 becomes the norm, it will most likely be spurred on by price decreases, price decreases that Ambarella (and other SoC manufacturers) will need to embrace.

### The Myth of a Takeover

Despite a valuation that leaves one faint from a lack of reality, there have been several rumors that Ambarella will be acquired by another tech company. Pacific Crest Securities analyst, [Brad Erickson](#), has been the most consistent believer in this. Erickson believes (and many others if one trolls through internet message boards of Ambarella) that Qualcomm is the most logical buyer. With their recent \$10 billion debt [offering](#), Qualcomm is supposedly looking for large acquisitions.

There are multiple problems with this unfound belief. First, half of the money will be allocated to share buybacks. After buybacks, that would leave \$5 billion to acquire other companies. At the current valuation, Ambarella has a market cap of \$3.8 billion on a fully diluted basis. Qualcomm would need to rationalize paying more than 40x for earnings to be realized in 2017. This would be a very tough sell to the board, although certainly not impossible.

What makes the sell even tougher is who sits on the board. Barry Rosenstein's [Jana Partners](#) owns more than \$2 billion worth of Qualcomm stock. Jana has generally been a responsible shareholder and works with companies to reward shareholders. I believe (but cannot prove) that Jana would want little association with buying a company like Ambarella at its current valuation.

### Valuation

A short of Ambarella is not predicated on bad management (indeed, I believe management is quite good here), or any egregious action, simply overvaluation and simple capitalism. I believe more competitors will enter the space over time, and many of Ambarella's end products will either prove to be fads, or lose their tremendous growth rates as the law of large numbers works its magic.

The model below shows what growth could look like if revenues grow at 35% per year and the company becomes taxed at 25%, which would be lower than the current federal rate to account for international cash generation.

Table 2. Bullish Earnings Estimate for Ambarella

Year	FY 2016	FY 2017	FY 2018	FY 2019
Revenue	\$294,675	\$397,812	\$537,046	\$725,012
Gross Margin	61.0%	59.8%	58.6%	57.4%
Gross Profit	\$179,752	\$237,812	\$314,625	\$416,249
R&D	\$66,332	\$69,649	\$73,131	\$76,788
SG&A	\$33,692	\$37,061	\$40,767	\$44,843
Operating Income	\$79,728	\$131,103	\$200,727	\$294,618
Operating Margin	27.1%	33.0%	37.4%	40.6%
Net Income	\$63,783	\$104,882	\$160,582	\$235,694
EPS	\$1.91	\$3.07	\$4.72	\$6.83

This looks great, if it is even close to reality. If this type of earnings growth is sustainable over a long period, an analyst could apply a 35x multiple to the 2016 number and determine a fair value on a Price-to-earnings to growth ratio (PEG ratio). For the sake of argument, I will apply a 40x multiple to account for excess growth and potential new markets.

A 40x multiple on FY 2016's estimated EPS of \$1.91 would result in a price target of \$76.22/share, some 34% below the current market capitalization of Ambarella. There are very few companies that can maintain 40x multiples. Generally, companies with 40x multiples are market leaders with established moats and have a long runway for their products. While Ambarella has a first mover advantage, they are hardly the only company in the space and their moat will be overcome once a larger player starts to notice the excess margins Ambarella is enjoying.

Put another way. If 2016 earnings are \$1.91, does Ambarella deserve a 60x multiple?

Given the potential competition that Ambarella has coming for it, the fad products they supply, and the spotty history of losing customers overnight, I believe that Ambarella deserves a much more pedestrian multiple. Currently, the S&P trades at a 22x EPS multiple. Given Ambarella the benefit of doubt, and assuming it deserves a 10% market premium, they would command a 25x multiple. If we apply a 25x multiple to my 2016 estimates, Ambarella is worth \$47.75, or 58% less than the current market value.

Finally, a DCF requires a Herculean effort to achieve fair value at \$115/share. If I assume 35% growth until 2019, apply a terminal value of \$150.26 to earnings after 2020 and discount the cash flows back at a paltry 8%, I achieve a price target in-line with today's share price. Ambarella has yet to operate consistently for a decade, but bulls are applying multiples to the company that imply it will operate consistently and steadily for *decades* to come.

The valuation simply does not make sense. Any way you slice and dice it, Ambarella has a fair value that is at least 34% below the current value and likely more than 50% lower. Bulls are assuming that the company continues to grow rapidly, scales into new markets, and enjoys a lonely position in the market for years to come. Bears only simply need to believe that markets are rational, customers want multiple suppliers, and competitors will emerge to arbitrage the margins that Ambarella *may* enjoy.

As a final note about valuation and the changes that take place in tech, consider Qualcomm, the potential acquirer of Ambarella (see previous section for an overview). Qualcomm at one point was the only real chip provider in town and enjoyed enormous competitive advantages over rivals. This has begun to reverse though and Qualcomm, once an infallible company, is now being challenged by activists to improve the business and turnaround declining sales. Tech changes fast, bulls should remember that before placing premium valuations on businesses that appear indefensible.

### **Risks**

As a high flying tech stock, Ambarella enjoys plenty of love right now. There are a number of risks to Ambarella.

1. Ambarella could dominate the market for years to come. A significant portion of my thesis is that other competitors will enter. While this follows basic capitalistic principles, it may not happen as fast as I think. As an example, the Chinese have tried to get into DRAM for a number of years now with little success. Ambarella could have a long-term competitive advantage.
2. The demand for their products could extend into other markets. It is clear that analog video is going away and digital is here to stay. Ambarella could find ever more markets to enter in.
3. This is a stock held by a number of retail owners. Retail investors could bid this up excessively. Position sizing will be paramount here, even if there is substantial downside.

### **Conclusion**

Ambarella belongs to an elite club that Dichotomy Capital loves. The >10x price-to-enterprise value club. This club is ripe with successful shorts over the years, and Ambarella will likely be the in the same boat when we look back several years from now. With a number of competitors staring at the company, I believe Ambarella will suffer the same fate it suffered several years ago – their core market will tighten tremendously and perhaps even disappear. The current stock price assumes that Ambarella will enjoy the margins and market share they currently enjoy for decades to come. I believe decades of prosperity (and the multiples that go along with it) should be bestowed upon only the best companies in the universe. My price target is \$50/share, which allows plenty of room for revenues, and profitability, to grow for the company.

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