

EZchip Semiconductor Ltd. (EZCH)

Competitive Threats, Customer Defections and an Unsustainable Valuation

We believe that shares of EZchip Semiconductor Ltd. (EZCH) are highly overvalued. EZCH shares currently trade at \$23.97, implying an egregious 7.5x 2013E EV/Revenue and a 32.5x GAAP P/E, surprising multiples for a business that has repeatedly demonstrated its inability to grow. As we frequently see in mispriced businesses, a high-level sector story – in this case, the need for greater bandwidth on capacity constrained carrier networks – has steered investors into an overpriced stock with many idiosyncratic risks. We believe that investors are not properly assessing the competitive risks posed to EZchip's business or the limits of the addressable market, especially in light of EZCH's astronomical valuation.

Before 2012, EZCH was fortunate enough to have little outside competition in high-speed network processors. But since the start of last year, two well-funded industry leaders have mounted attacks into EZchip's core Network Processing Unit (NPU) business. To begin with, Marvell Technologies ([MRVL](#)) began to compete for NPU market share following their January 2012 acquisition of EZchip's then-largest competitor, Sweden-based Xelerated. Given EZCH's reliance on Marvell as a conduit in the foundry relationship with Taiwan Semiconductor ([TSM](#)), the new arrangement appears conflicted. The dynamics are akin to Coca-Cola ([KO](#)) relying on Pepsi ([PEP](#)) for the manufacturing of Coke syrup.

But the most substantial competitive risk to EZCH, in our opinion, is the entry of Broadcom ([BRCM](#)) into the high-speed network processor market. Through its acquisition of NetLogic in 2011, high-end semiconductors have become a strategic priority for BRCM. In April 2012, Broadcom [introduced](#) a full-duplex 100Gb (i.e. 200Gb/s) NPU, pitting EZchip's upcoming NP-5 in direct competition with an industry leader. While EZchip touts its 200Gb/s headline figure for the NP-5, the chip is merely a full-duplex (two-way) 100Gb/s device, giving it the exact same bandwidth as Broadcom's chip. Another critique of BRCM's NPU is that it lacks an integrated "TCAM" (Ternary Content Addressable Memory). This argument overlooks the fact that Broadcom can add TCAM and other functionality as an [expansion](#). But most troublingly for EZCH's investors, Broadcom now produces each of the individual components of the line card (TCAM, NPU, multi-core processor, etc.), allowing them to write software that transcends across individual components. This might allow BRCM to optimize the efficiency of the various hardware inputs and constitute a strong selling point versus EZCH's NP-5.

But even if one believes that the BRCM component is somehow inferior, credible alternate vendors in the marketplace could drive down NPU pricing. This issue is overlooked by many analysts who instead rely on EZCH management for guidance. In their Q4 2012 [presentation](#), EZCH tells investors that it expects a 40% increase in unit pricing between 2012 and 2016. Not only is this assumption inconsistent with the entry of Broadcom and Marvell, it's contradictory to the very nature of Moore's Law, where more computational power is delivered at ever decreasing costs over time. NPU pricing is also limited by a constant threat of NPU replacement by in-house designs from the likes of Cisco, Huawei, ZTE, and other router manufacturers. Just over three years ago, Juniper decided to [replace](#) all of its EZCH chips with in-house designs on future router designs. EZCH shares fell [14%](#) immediately after the 2009 announcement. Huawei may have made a similar decision as they've delayed all EZCH orders as of Q4 2012. Management speculates that Huawei is using an in-house solution for at least a portion of their NPU demand, but they admit to having almost no visibility into this key customer account ([EZCH Q4 2012 Call](#)). A business that lacks pricing power should earn a commodity-like multiple, not the stratospheric valuation premium that EZCH currently boasts.

Foreseeing the threat in their core NPU market, EZCH has rushed to publically announce a shift towards the data center market. EZCH's L4-L7 next-generation processor ("NPS"), if successful, won't generate meaningful revenues until 2016+ (*Sept 5th NPS Call*). But that hasn't stopped some investors from glowingly referring to the NPS as a 'game changer.' Unfortunately for the EZCH bulls, a privately-held Intel spinout named Netronome already produces a 200Gb/s flow [processor](#) with L2-L7 functionality that has won widespread industry [praise](#). And as one of only a handful of outside partners with access to Intel's semiconductor foundries, Netronome's chips can be produced at the 22nm [scale](#) and below. Compare this to EZCH, whose next-generation NP-5 will only be produced at the 28nm [scale](#) with Taiwan Semiconductor.

Lastly, we believe that Wall Street research analysts are twisting forward EPS, and by association, overstating their EZCH price targets. Through the use of a non-GAAP technique that excludes stock-based compensation ("SBC"), we believe that the \$1.13 2013E consensus EPS is inflated by about 35%. Wall Street analysts have no logical grounding for excluding these costs. Given EZchip's meager revenue stream in relation to its \$690m market capitalization, its history of unfulfilled promises, the rapidly emerging competitive threats from Broadcom and Marvell, and EZCH's technological disadvantages in the data center market, we believe that EZCH's share price is poised for a sharp correction. Like many other technology hardware manufacturers dependent on a single customer for much of their revenue, EZCH's stock is one design loss away from falling by as much as 45%.

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I. Summary of Red Flags

We believe that EZchip is significantly overvalued for the following reasons:

- **Broadcom's 200Gb/s Network Processor Should Pressure EZCH's NP-5 Market Share and Price Point.** EZCH has historically benefited from its cushy position as the leader in a duopoly market with Xelerated (now Marvell). But that dynamic changed drastically this year when Broadcom announced its entry into the market in mid-2012 via the BCM 88030 network processor. According to recent management comments, Broadcom expects to enter production and have customers in 2013, some of which could be poached from EZCH ([BRCM 2012 Analyst Day](#)). EZchip has told investors that "we believe that substantially all NP-4 customers will select the NP-5," but that sounds more like wishful thinking than fact to us ([EZCH Q4 2012 Call](#)). While EZchip touts its 200Gb/s headline figure for the NP-5, the chip [is actually](#) a full-duplex (two-way) 100Gb/s device. This is precisely the same speed as Broadcom's BCM 88030, a full-duplex 100Gb/s processor. The confusing nomenclature may be [misleading](#) some investors to brush off the risks from Broadcom. Broadcom began a push into more complex processors in late 2011 with its [acquisition](#) of NetLogic. This has allowed Broadcom to design all of the individual components of the router line card (NPU, TCAM, multi-core processor, etc.). Broadcom's CEO explained the benefits of this integrated supplier approach, saying: "We're able to make the products work better together, so we can optimize our switches to work with the network processors...it's our goal to design [products] as a platform to bring significant advantage to customers who purchase all of them together" ([BRCM Q2 2012 Call](#)). A single publicly announced customer loss to BRCM could spell disaster for EZCH shares.
- **Marvell Technologies, the Sole Supplier for EZCH's NP-4 and NP-5, has Recently Become a Direct Competitor.** In order to guarantee manufacturing capacity, Cisco appears to have demanded that EZCH use a larger company as a conduit between itself and EZCH's semiconductor foundry, Taiwan Semiconductor Manufacturing. Marvell, as "the sole supplier of our NP-4 and NP-5" ([EZCH's 2011 20-F](#)), serves this function by employing its buying power to move its orders to the front of the queue. But the arrangement has grown increasingly conflicted following Marvell's [purchase](#) of Xelerated, a small NPU startup, in January 2012. Xelerated had [launched](#) a 50Gb/s full-duplex processor (100Gb/s) in August 2010 and was EZchip's chief competitor at the time. We would expect Marvell to support the Xelerated team with much-needed capital to potentially push forward a next-generation chip to compete with EZCH's NP-5.
- **EZchip's NPS Chip Appears Fundamentally Handicapped Versus the Privately-Held Netronome.** Investors who refer to the NPS chip as a 'game-changer' are severely underestimating Netronome, a privately-held Intel spinout run by an accomplished Caltech graduate. Netronome recently made its presence known by directly challenging EZCH at a Linley Tech Conference. A review of the conference illustrates the similarities between the two companies, [stating](#) that the NPS "will take EZchip beyond its switch/router roots and into a wider venue that looks more like, well, like Netronome's business". Netronome had previously [introduced](#) its 200Gb/s L2-L7 chip (called NFP-6xxx) back in June 2012. And notably, as only one of a handful of Intel fabrication customers (others include Archronix and Tabula), Netronome should hold a long-term technological advantage versus EZchip. Intel's best-in-class foundry has allowed

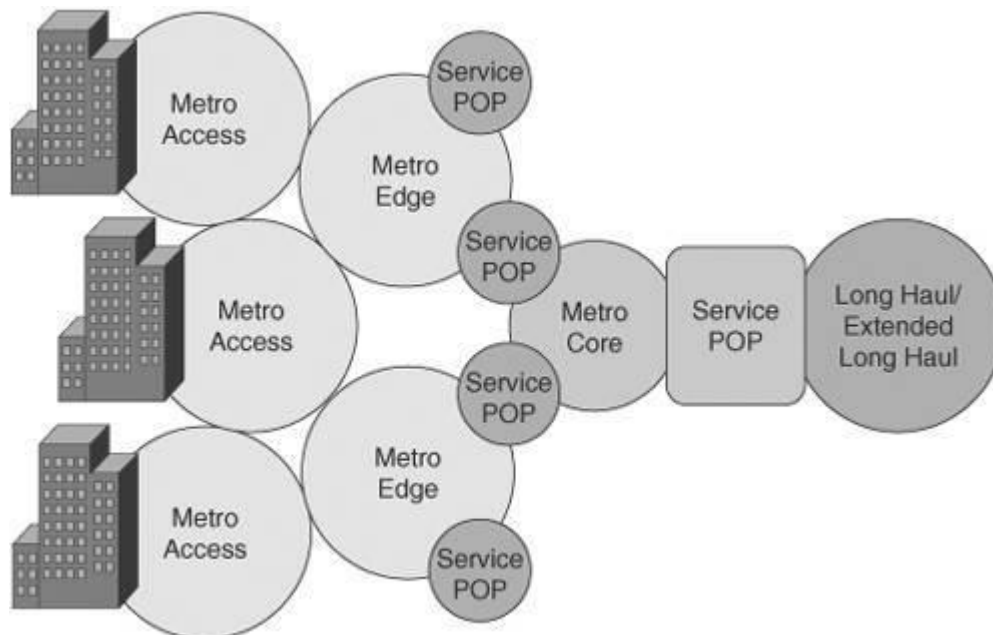
Netronome to create its NFP-6xxx at the 22nm scale, and future designs may be made on Intel's 14nm scale. On the other hand, EZCH's foundry provider, Taiwan Semiconductor, will fabricate the supposedly next-generation NP-5 at only a 28nm [scale](#). A smaller manufacturing scale can increase energy efficiency and add to bandwidth capacity. As a private company, Netronome has been under-covered by equity analysts and we believe that EZCH investors are underestimating the risks imposed by this formidable competitor. The significance of the Intel foundry relationship may be confirmed as Cisco is [rumored](#) to be near announcing a billion dollar foundry deal with Intel to produce its own silicon chips. If this were the case, it would prove that Cisco clearly values Intel's 22nm-scale technology.

- **Consensus EPS Estimates use Non-GAAP Measures that Inflate EPS (and Analyst Price Targets) by Roughly 35%.** To boost their lackluster earnings figures, EZCH management guides investors using non-GAAP reporting figures that exclude stock-based compensation ("SBC"). While this tactic is frequently used by technology companies, disciplined investors and analysts shouldn't be fooled. Since public shareholders of EZCH stock didn't receive their stock for free, then how can stock be gifted to EZchip's employees without expense? Of the research reports we've read, Felt & Company, Deutsche Bank, Jefferies, Brean Capital, and Oppenheimer all follow management's non-GAAP EPS to build their price targets. EZchip gifted its employees about \$11m in stock options over the last twelve months (EZCH [20F](#), [6K](#)), translating to a decrease in EZCH's non-GAAP EPS by about \$0.39/share. This calculation has a very material impact on the price targets for a company which earns as little as EZchip does. For example, Felt & Co reaches a strong buy conclusion and a \$35 target price by using a 22.5x P/E multiple on 2014 Non-GAAP EPS of \$1.55 (February 14th report). If we removed \$0.39 of stock-based comp expense from Felt's figures, their same valuation multiple yields a target price of only \$26. Because of this widely perpetuated miscalculation, it is a mistake for the investor community to be guided by forward multiples on Yahoo Finance or other sites that rely on these inflated non-GAAP EPS figures.
- **Given What's Been Discussed Above, We Believe that Shares are Overvalued by as Much as 45%.** Based on the forthcoming competitive risks from Broadcom and Marvell, EZCH's extensive track record of overstating growth potential, a relative lack of pricing power, and a weak backdrop in carrier spending, we believe that EZCH stock should now trade at a valuation multiple more in line with the broader semiconductor market. Peers demonstrating year-over-year revenue growth, unlike EZCH, generally trade between 10 and 15x 2013 P/E. After deducting our estimated SBC of \$0.39/share from the Street's non-GAAP EPS estimate of \$1.13, we valued EZCH based on our adjusted 2013 EPS estimate of \$0.74. With the addition of 25% of EZCH's cash balance, a generous 2013 P/E multiple range of 15 – 20x leads to a valuation range of \$12.50 - \$16, or a 32% - 48% discount to the current trading price. We also don't believe that management's 3x revenue target by 2016 is realistic, and instead have used Gartner industry projections and our own assumptions to reach a 'bull-case' 2016 revenue target of \$85m. At a 35% - 40% EBITDA margin and a 6x - 8x multiple, this translates into a price target of \$14 - \$17, still a 29% - 43% discount to the current price.

II. Company Overview

EZchip designs high-speed Ethernet Network Processors (“NPU”) used by the telecom industry to increase bandwidth in the aging ethernet networks used for phone, data, and voice services. EZchip’s processors are used in high-speed network routers sold by Cisco, ZTE, Juniper Network, and other hardware businesses that then sell routers directly to businesses like AT&T and Verizon. The Carrier Ethernet network can be divided into three domains: i) the Access network that connects individual traffic flows (“the last mile”); ii) the Edge (or “Metro”) network that aggregates traffic within an urban area, and finally; iii) the Core network, which routes and processes all data requests to the proper channels. Access NPUs tend to have lower bandwidth requirements (1Gb/s-20Gb/s) than Edge NPUs (20Gb/s+). EZCH’s routers are designed for the “Edge” of the network. Edge routers aggregate the incoming data streams from individual access routers and direct them to the Core. As one moves closer to the Core, router processing needs become increasingly complex. Because of this, better-capitalized router manufacturers such as Cisco and Juniper produce their Core routers using in-house NPUs that have computing power beyond that of EZCH’s chips. These in-house Core chips are commonly called ASICs (application-specific integrated circuits). In order to save costs and overhead, some of these router companies outsource the simpler Access and Edge chip design to smaller companies like EZchip. Competitors in the high-speed NPU market include Marvell Technologies, Broadcom, and in-house chip design teams that decide against sourcing NPUs from an outside provider.

As a fabless semiconductor business, EZCH is reliant on Taiwan Semiconductor Manufacturing to manufacture its finished processors. TSM, which produces \$17bn in annual revenue, probably views EZCH (\$55m 2012 revenue) as a footnote on its customer list. Because of this, Cisco uses Marvell Technologies (a much larger TSM customer) as a conduit for its EZCH orders to ensure that its outsourced chips get priority at TSM’s foundries (*EZCH 2011 20-F*).



EZchip currently boasts an enviable valuation of 9.6x 2012A revenue, 37.8x 2012A EBITDA, and 44.4x 2012 GAAP P/E. At valuation multiples as high as these, it's not surprising that many cling to the belief that EZchip's best days are yet to come. As with many overvalued stocks that we've encountered, management directs investor attention to an outsized addressable market opportunity in order to distract investors from disappointments in its underlying business. The EZCH bull case relies on its ability to achieve dominant market share of its 2016 "Total Serviceable Market" of \$800m, consisting of a \$400m NPU opportunity and a \$400m data center opportunity (Q4 2012 investor presentation). Management further encourages the investor frenzy by leading investors to believe that revenue will grow 2.8x-3.7x by 2016 from the 2012 figure of \$54.7m. This forecast was recently reduced from a revenue multiplier of 4x-5x, as had been used in the Q3 2012 investor [presentation](#). Considering that EZCH's management has a history of over-promising and under-delivering, we caution investors against any of this forward guidance at face value. Those who believed management's promises of growth have been sorely disappointed time and time again. EZCH's revenue shrank from \$63.5m in 2011 to \$54.7m in 2012, hardly the type of momentum one would expect from a business with an almost 10x 2012A revenue multiple.

<u>Capitalization</u>		<u>Valuation Multiples</u>		
<i>\$mm, excl. share price</i>	<i>3/8/2013</i>	<i>\$mm; Consensus Est⁽³⁾</i>	<i>Figure</i>	<i>Multiple</i>
Current Share Price	\$23.97	2012A Revenue	\$54.7	9.6x
Outstanding Shares ⁽¹⁾	28.2	2013E Revenue	69.7	7.5x
Dilutive Effect of Options ⁽²⁾	0.7	2014E Revenue	94.2	5.6x
Market Capitalization	\$693.0	2012A EBITDA	\$13.9	37.8x
Less: Cash	(168.3)	2013E EBITDA	30.5	17.2x
Add: Debt	–	2014E EBITDA	48.8	10.8x
Enterprise Value	\$524.7			

Sources

- (1) Weighted Avg per Feb 13h Form 6-K
- (2) EZCH 2011 20-F
- (3) CapitalIQ
- (4) LTM stock-based compensation of \$11.2m or \$0.39/share (20-F, 6-Ks)

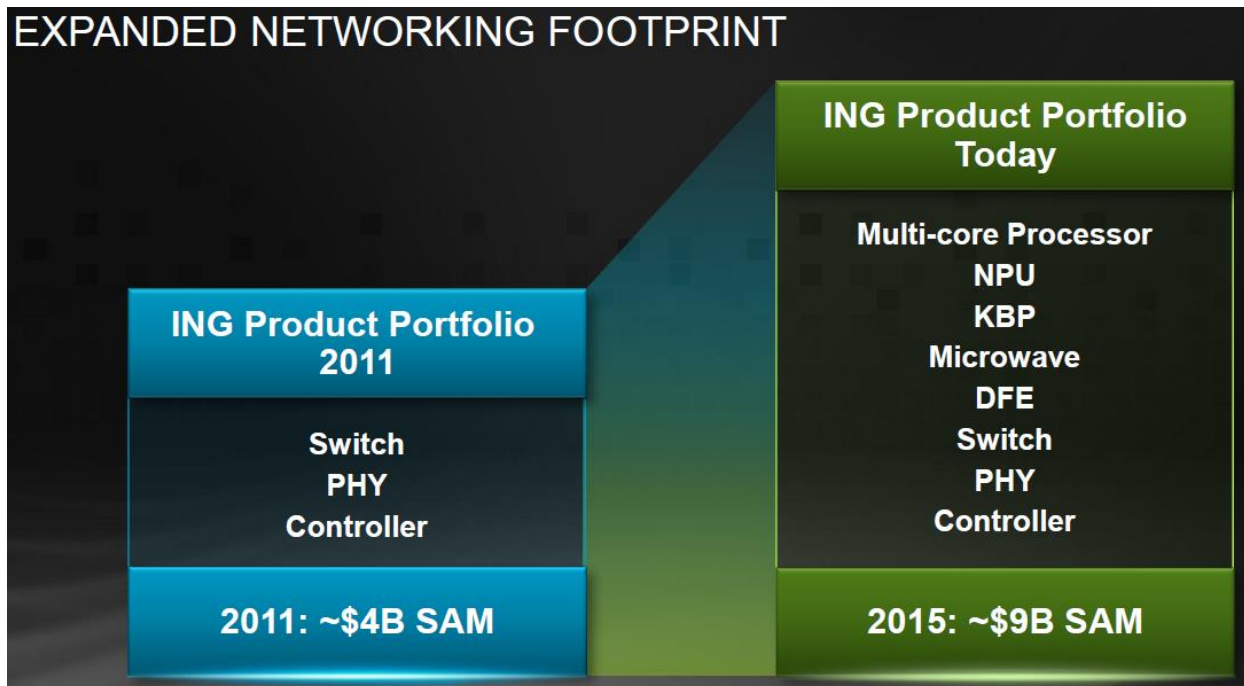
2012A EPS (GAAP) ⁽⁴⁾	\$0.54	44.4x
2012A EPS (Add-back SBC)	0.92	26.1x
2013E EPS (GAAP) ⁽⁴⁾	0.74	32.5x
2013E EPS (Add-back SBC)	1.13	21.3x
2014E EPS (GAAP) ⁽⁴⁾	1.24	19.3x
2014E EPS (Add-back SBC)	1.63	14.7x

III. Looming Competitive Threats

Industry Leaders are Encroaching on EZCH's Core Market

EZchip has historically been fortunate enough to have just one significant competitor in high-speed NPUs, the privately-funded Xelerated. But last year, the competitive landscape drastically changed. To begin with, Marvell Technologies [acquired](#) the Swedish-based Xelerated on January 4th, 2012. At the time, Xelerated was the only company [producing](#) a 100Gb/s NPU aside from EZchip. Marvell will now compete in the 100Gb/s NPU segment directly with EZchip while remaining EZCH's only manufacturing partner. This newly antagonistic relationship with Marvell leaves EZCH in a precarious situation since the majority of EZCH's foundry orders at Taiwan Semiconductor are run through Marvell. Should the Edge processor market eventually become large enough, Marvell may decide its share of NPU revenues are more important than the royalties it collects serving as a manufacturing conduit for EZCH.

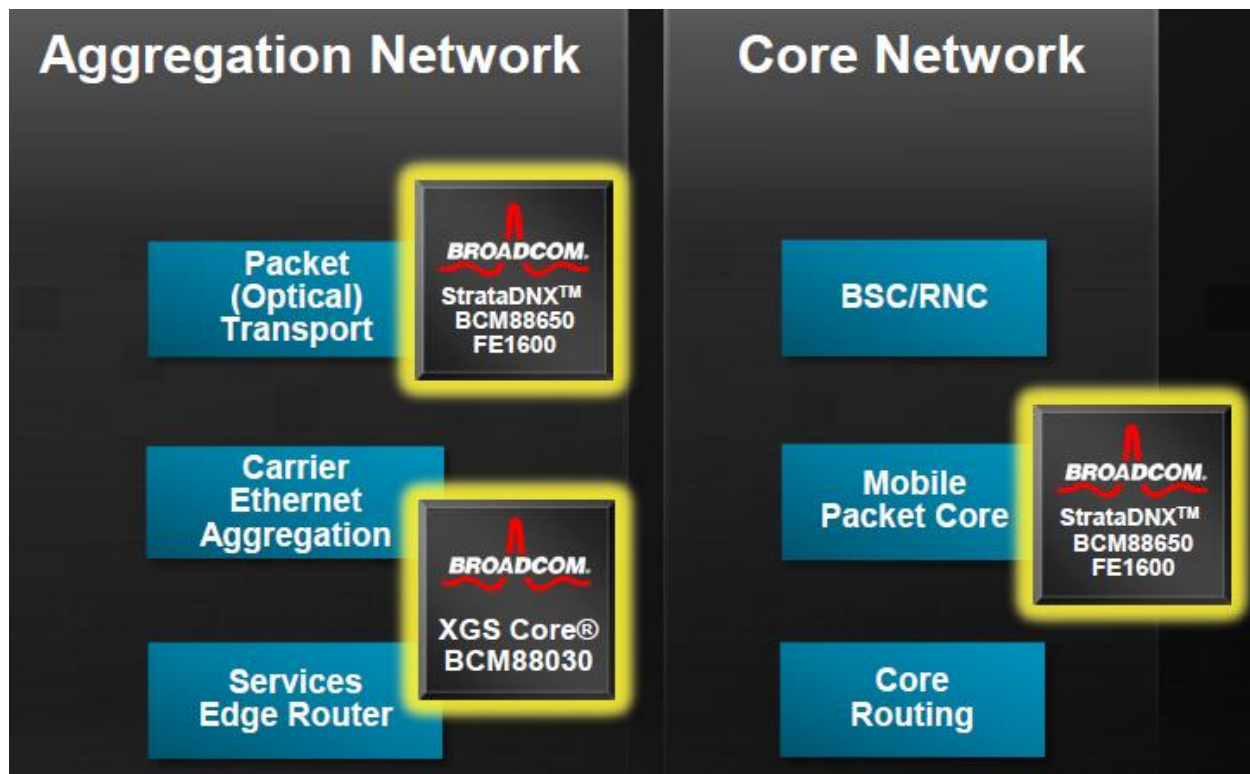
In addition to Marvell, we believe the biggest near-term competitive threat to EZchip is Broadcom. Broadcom began to vastly expand its product portfolio in September 2011 when it [acquired](#) the multi-core and high-performance processor maker NetLogic for \$3.7bn. This marked the start of Broadcom's foray into NPU design using the engineering talent brought in from NetLogic. By providing all components in a network line card (NPU, multi-core processor, TCAM, etc.), Broadcom intends to bundle its solutions, which could eliminate the need for individual component providers like EZchip. Broadcom's newly expanded product platform is shown below:



Source: BRCM December 6th, 2012 [Analyst Day](#).

Broadcom officially announced the BCM 88030 high-speed network processor, a full-duplex 100Gb/s (effectively 200Gb/s), in April 2012. EZCH's share price fell 9% on the announcement, but little has been made of the announcement since. Broadcom, on the other hand, appears extremely excited about its new market opportunity. At its 2012 analyst day on December 6th, Broadcom gave an update on the progress it has made:

“Another example of a product that expands our [addressable market] is 100 gig network processor that we that we introduced earlier this year. And by the way, you should be seeing all these products in production, right, with customers in 2013. So again, this is a product that's -- it that 100 gigabits of full duplex processing. Our nearest competitor's product about 40 gig, if you look at it as an apples-to-apples comparison, and again, this is a product that very well-positioned for further penetration into the traditional network processor market in EDGE routers primarily, as well as in some core router applications, as well as packet transport applications.”
 –BRCM at December 6th Analyst Day

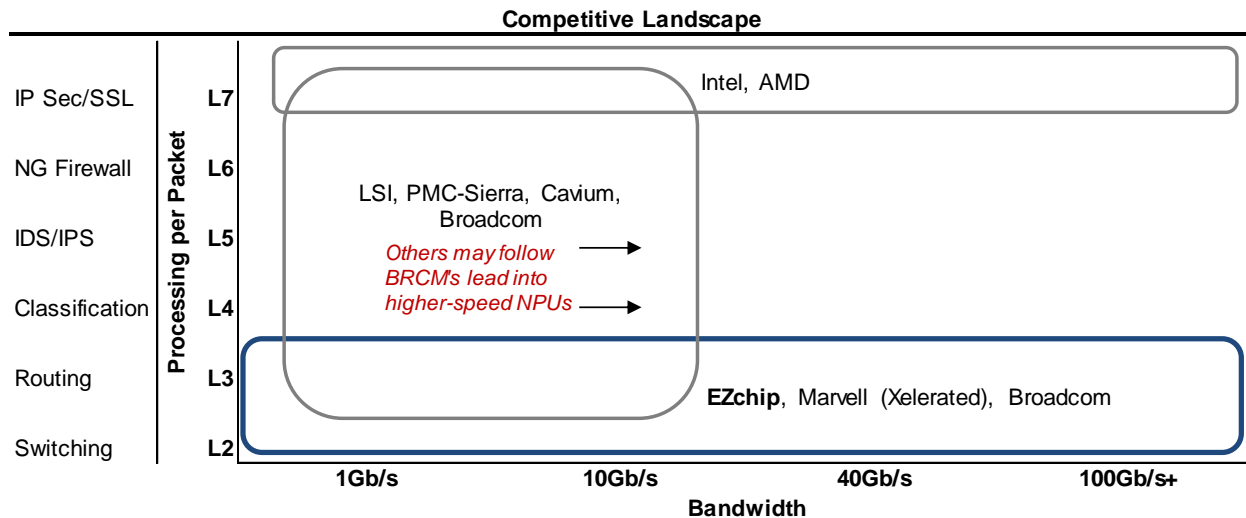


Source: Slide 35, BRCM December 6th, 2012 Analyst Day.

EZCH has only recently begun to acknowledge the competitive threat posed by Broadcom, and even now does so ever so slightly. After adopting a very defensive tone when asked about the competition on its Q4 2012 earnings call, EZchip brushed off the concern by stating that, “we don’t see much of them [BRCM and Marvell] in edge routers” (*EZCH Q4 2012 Call*). Just three months before, on the Q3 2012 earnings call, EZCH’s CEO stated that, “We said all along that we feel that with NP-4 and NP-5 we kind of securing our market and our customers and we don’t feel that we really have competition there... We feel that with NP-5, the chances for us to secure all the 5 large customers are pretty high” (*EZCH Q3 2012 Call*). Since management’s comments are generally taken as absolute truth by EZCH analysts, the Street is not currently modeling for the pricing and market share effects of a Broadcom entry. We believe that this is a gross mistake and will lead to EZCH (once again) missing its projections in the near future.

Further Competition Could Emerge if Market Opportunity Grows

Besides the head-to-head competition from Marvell and Broadcom, there are at least half a dozen general purpose processor companies that have the potential to expand into high-speed NPUs. These potentially incremental competitors include [LSI \(LSI\)](#) and [PMC-Sierra \(PMCS\)](#), both of which already produce low-speed NPUs. For instance, PMC-Sierra is already the #1 [manufacturer](#) of lower-speed mobile backhaul network processors. Should the high-speed market grow in size, these companies would should the resources and in-house capability to quickly enter EZCH’s market.



Source: Kerrisdale Research, Company filings

In-house Chip Design Concerns: The Juniper and Huawei Case Studies

While outside competitive threats are hardly discussed by management, EZchip management acknowledges the potential for router customers to bring NPU design in-house, previously mentioning that “the competition comes from in-house, from our customers that has always been our concern in edge routing and that continues to be our concern” (*EZCH Q3 Call*). Juniper Networks, once EZCH’s largest customer, was the first major vendor to abandon EZchip in 2009. Juniper first began selling routers embedded with the NP-2 processor in 2007 and accounted for as much as 55% of EZCH revenue in 2008. But then, in an attempt to compete more effectively with Cisco, Juniper announced a manufacturing contract with IBM that allowed it to bring NPU chip design in-house. This October 29, 2009 [announcement](#) was a major body blow to EZchip’s long-term business viability as it removed a top-tier router vendor from the customer list. Yet somehow, EZCH shares only fell 7% from \$12.84 to \$11.97 on the date of the announcement. Normally, when a company loses its largest customer, the market reaction is much more negative. But EZCH’s investors seem to repeatedly put a mystical faith in the future of this business.

Investors were once again blindsided on February 13, 2013 when EZchip announced on its Q4 2012 call that Huawei had not yet placed production orders, leading management to believe that Huawei was substituting in-house designs for EZCH chips. Management’s conclusion that Huawei is developing an in-house solution is “currently a mere speculation” (*EZCH Q4 2012 Call*) since EZCH apparently doesn’t maintain an open dialogue with Huawei. While EZchip remains optimistic that they’ll only be replaced in the “lower end,” management’s lack of insight into a key customer account betrays a much broader concern, the lack of intimacy between EZchip and its key customers. We saw this dynamic at work in our previous [work](#) on [MLNX](#). If a business with only a handful of customers cannot maintain a clear grasp of the strategic intentions of a major customer, it’s equally unlikely to correctly predict its revenue stream years into the future.

The EZchip congregation may be slowly losing its faith as EZCH shares fell over 20% after the Q4 2012 call. The Juniper and Huawei examples remind us that EZCH’s designs are perpetually

at risk of replacement. Going forward, investors should remember that Cisco is unlikely to ever pay EZchip hundreds of millions of dollars for something it might be able to [do itself](#).

EZCH's Naivety to Competitive Risks is Consistent with a History of Disappointing Results

Bullish research reports and investor write-ups on EZCH typically argue that EZCH's premium valuation is warranted by a steady revenue stream from past and future design wins. Because EZCH's customers, such as Cisco and ZTE, generally stick with a single NPU manufacturer for each router model, once a design is won it tends to be sticky for the lifetime of that product cycle. But empirical evidence suggests that EZCH's quarterly revenue is actually highly volatile, quite the opposite of a steady income stream. This is the result of EZCH's over-reliance on telecom carrier expenditures, which is an extraordinarily difficult market to forecast.

\$m; year-end Dec 31st	2011A				2012A			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Revenue								
Cisco	\$4.6	\$5.3	\$3.6	\$3.4	\$7.0	\$5.8	\$4.0	\$6.5
% QoQ Growth	109.1%	15.2%	(32.1%)	(5.6%)	105.9%	(17.1%)	(31.3%)	63.0%
Juniper Networks	2.9	3.4	5.5	3.4	1.8	2.2	2.1	3.2
% QoQ Growth	81.3%	17.2%	61.8%	(38.2%)	(47.1%)	22.2%	(4.5%)	52.4%
ZTE	0.4	2.2	3.9	0.3	1.5	3.6	0.7	1.5
% QoQ Growth	(94.9%)	528.6%	77.3%	(92.5%)	410.2%	140.0%	(80.6%)	114.3%
Other	5.3	6.4	5.7	7.2	4.1	4.2	2.5	4.0
% QoQ Growth	(18.5%)	20.2%	(11.0%)	25.8%	(42.6%)	2.0%	(40.4%)	59.8%
Total Revenue	\$13.2	\$17.3	\$18.7	\$14.3	\$14.4	\$15.8	\$9.3	\$15.2
% QoQ Growth	(23.1%)	31.3%	8.1%	(23.7%)	1.0%	9.6%	(41.2%)	63.7%

Sources: EZCH 6-K and 20-F [filings](#); earnings calls

With such unpredictable end-market demand, it would be hard for any company to have good visibility on near-term results. But this hasn't stopped EZCH from bullishly proselytizing to its investors. As the inconsistency between the quotes below and EZCH's underlying financial results shows, EZCH's growth promises have proved false time and time again.

"We continue to believe that ZTE is still early in its ramp up and continue to be excited by the growth potential that ZTE represents with the NP-3 and the NP-4" – Q4 2010 Earnings Call

"But we feel comfortable that NP-4 will grow very significantly starting in the second half of [2011] and next year [2012]." – Q1 2011 Earnings Call

"So, basically, we believe that other than Juniper, we expect all our other customers to grow on a year-over-year basis." – Q2 2011 Earnings Call

"We expect Cisco to grow significantly for us in 2012." – Q4 2011 Earnings Call

“We expect our main growth drivers for 2012 will be the ramp up of our new NP-4 customers and the recovery in... carriers' capital expenditure. We believe this will result in year-over-year growth in 2012.”
– Q1 2012 Earnings Call

Given management's track record of over-promising and under-delivering, we believe that investors should be highly skeptical of EZCH's commentary going forward.

IV. Tepid End-Market Demand has Forced Risky Change in Strategy

December Gartner Report Lowered Expectations for the Carrier Capex Market

Gartner, the well-regarded research institution, [released](#) a Q4 2012 update to its Carrier Network forecasts that portends a bleak future for traditional wireline spending. Gartner now predicts that network infrastructure spending will decline 6.6% in 2012 compared to 2011 due to “weaker demand and aggressive price competition.” Making matters worse for EZCH, global telecom players such as AT&T, Verizon, China Telecom, and Vodafone are increasingly focused on mobile networks and backhaul as opposed to wireline installations. While EZCH does sell into the wireless market, it appears from the exchange below that mobile backhaul accounts for less than 10% of EZCH's business.

<Q - Paul McWilliams>: Okay. End market-wise, what percentage of your NP sales are driven by carrier, is that 100%, 90%?

<A - Dror Israel>: About 90%.

<Q - Paul McWilliams>: Okay. With the balance coming from enterprise?

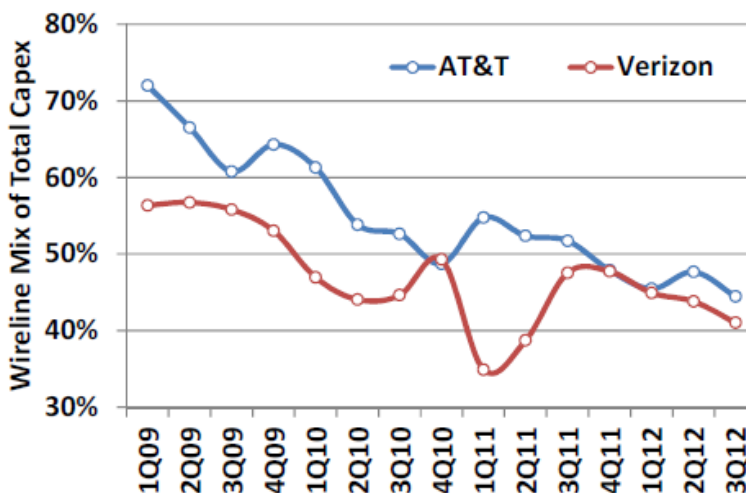
<A - Dror Israel>: Not only enterprise, but let's say more access, kind of boxes, and wireless backhaul and these kind of...

<A - Eli Fruchter>: But it's also, Paul, it's also some enterprise. It's things like load balancing, which we see, some security boxes where our chips will be used as accelerators for [ph] Intel CPUs (45:23) or multi-cores. And so it's really very, very many different applications I would say that will make the remaining 10%.

Source: EZCH Q2 2012 Call

If the comments on mobile backhaul indicate that a substantial portion of EZCH's business is driven by core wireline routing, then recent spending patterns from AT&T and Verizon should be concerning. Wireline capex as a percentage of total spending has collapsed from around 60% in 2009 to around 40% today. EZCH attributes much of its recent weakness to this trend: “There is short-term problem...it depends on...the carrier CapEx and service providers spending especially wireline... and this is the main reason for the decline in expected revenues” (EZCH Q2 2012 Call).

Figure 1: Wireline Capex Mix on a decline



Source: Company reports and CapStone Investments estimates

Source: November 9th, 2012 Capstone Investments Research report.

Poor Prospects in Carrier Ethernet have forced a Shift to the Data Center

The telecom infrastructure market is not nearly as exciting as it once [was](#). Between these end-market headwinds and EZCH's inability to drive NPU growth, it's quickly apparent why investors are growing wary of the EZCH story. These fears first materialized on EZCH's Q2 2012 [call](#) when management announced Q3 revenue guidance of \$8m-10m, a ~40% sequential decline from the previous quarter. Spooked investors sent EZCH shares down 25% after the call. EZCH must have felt compelled to reassure these jittery investors as it rushed to pre-announce plans for a research-stage product just three weeks after the Q2 call. On August 28th, EZchip [pre-announced](#) that it was going to unveil a new product line on September 5th. By the time September 5th finally arrived, EZCH shares had already recovered more than half of their original loss. EZchip even hosted an analyst call to announce its new project, dubbed the "NPS" (Network Processor for Smart Networks). We believe that this early announcement was a tacit admission that EZchip foresees continued market weakness and mounting competitive pressures in Carrier Ethernet.

EZchip "does not have customer commitments" for the NPS but said that it expects to "see design wins for the NPS in the first half of next year [2013]" while conceding that "it's too early to talk about target numbers" (*EZCH Sept 5th NPS Call*). This project has caused a ramp in R&D spending, up from \$4.1m in Q3 2011 to \$5.2m in Q3 2012 and Q4 2012. Since EZCH has said that the NPS won't meaningfully contribute to revenue until 2016, this growing R&D expense on an unproven technology should be a headwind on earnings for years to come.

EZchip's NPS Technology is Fundamentally Disadvantaged

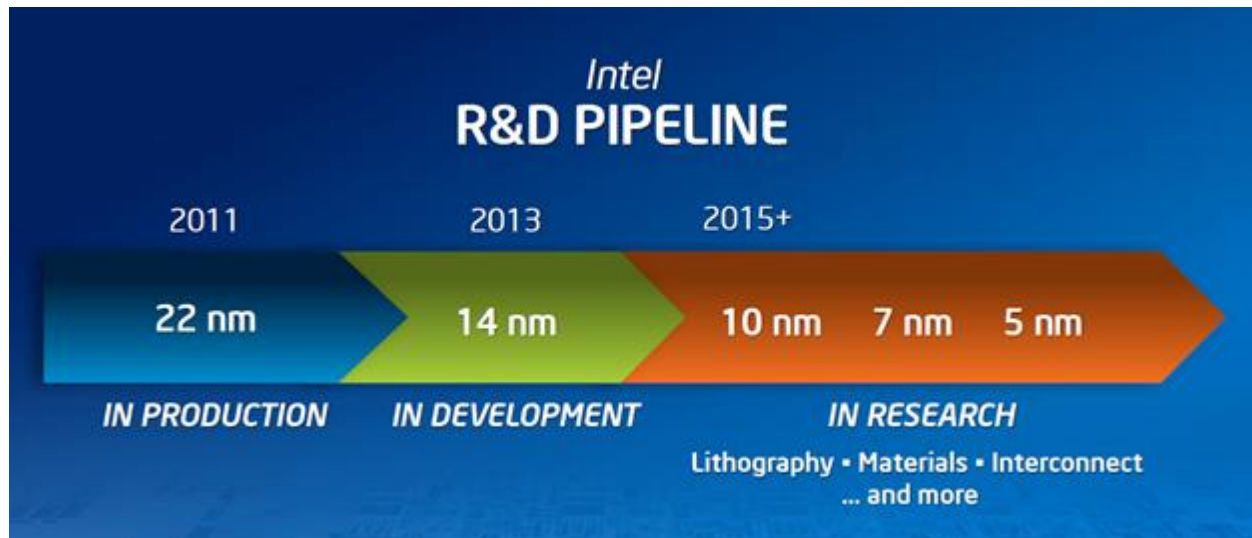
Whereas EZchip's series of NP processors are optimized for carrier networks, the NPS will be designed for the data centers. EZchip claims that the advanced 'L2-L7' architecture adds \$400m to EZCH's total serviceable market, doubling its overall market opportunity by 2016. Because

this opportunity stretches so far into the future and includes a myriad of unknowns, we would warn investors against even considering adding it into EZCH's valuation until definitive customer agreements assigned. But since the stock market loves a good story, we'll address our immediate concerns.

The most direct potential competitor comes in the form of an underfollowed, privately-owned business named Netronome. Netronome is a spinout from Intel that focuses solely on high-end network processors. Netronome has already designed a 200Gb/s chip (NFP-6xxx) for the data center, putting it well ahead of EZCH's NPS. The Linley Group also [believes](#) that the flexibility of the chip makes it a competitor to EZchip's NP-5 for the next-generation network processing market. The Intel spinout is run by Howard Bubb, a Caltech-educated electrical engineer who previously held senior positions at Intel, and the venture is funded by blue-chip investors such as Tudor, Top Technology Ventures, and DFJ Esprit. Within the next year or so, we think that Netronome could announce a next-generation chip that matches the theoretical bandwidth of EZCH's NPS chip, putting pressure on EZCH's share price. Beside the potential trouble for EZCH's NPS chip, Netronome also [aspires](#) to move into EZchip's core L2-L3 Carrier Ethernet market. The Chief Router Architect at ZTE, a major EZCH customer, recently praised Netronome's NFP [chip](#):

"Netronome has once again delivered on its strengths; flow-aware processing and large scale integration of programmable resources. The flexible, ultra high speed interfaces, processing cores and network specific hardware accelerators provided by NFP-6xxx family of products allow it to be positioned in both the line cards as well as service cards of next generation routers. NFP-6xxx along with prepackaged networking software closely aligns with our vision for our router family of products" - Ye Zhining, Chief Architect Router Products, ZTE.

Aside from these glowing reviews, we believe that Netronome holds an important manufacturing edge over EZchip. Netronome's NFP-6xxx chips are [built by Intel](#) using a 22-nanometer manufacturing scale. EZchip, on the other hand, is reliant on a TSM foundry that is consistently a generation behind Intel. On the September 5th NPS call, EZCH said it plans to "use 28 nanometer for [the NPS]" (*EZCH Sept 5th NPS Call*). EZCH's NP-4 currently engages TSM's 55nm scale while the NP-5 will also employ TSM's 28nm manufacturing process. Smaller manufacturing architecture can translate directly into better speed, power use, and efficiency metrics. But by the time of EZchip's potential NPS release, Intel's fabrication facilities will have already moved to 14nm and beyond.



Source: Intel 2012 Investor [Meeting](#), page 37

Beyond the direct threat from Netronome, the data center market is already occupied by heavy hitters such as Cavium ([CAVM](#)) (see [Cavium Octeon III Sizzles at 100Gbps](#)), PMC-Sierra, and LSI. These well-capitalized competitors will most certainly fight to protect their share of the L4-L7 chip market and will move into higher-speed chips should market demand warrant.

V. Unsustainable Valuation by Any Measure

The semiconductor industry, as a group, tends to trade at a relatively modest valuation multiple given the industry's reliance on product cycles and the commoditization of many parts of the business. Competitive advantages disappear overnight and customers can leave within a single product cycle. But when a misunderstood company becomes the flavor-of-the-month, valuation metrics can quickly get out of hand. Such has been the case for EZchip's 40x+ 2012 P/E multiple.

USD in millions	Share Price	Market	Enterprise	EV / Revenue		EV/EBITDA		P/E ⁽¹⁾	
	3/8/2013	Cap	Value	2012A	2013E	2012A	2013E	2012A	2013E
EZchip	\$23.97	\$693.0	\$524.7	9.6x	7.5x	37.8x	17.2x	44.4x	32.5x
<i>Semiconductor Competitors</i>									
Intel Corporation	\$21.61	111,487.0	99,731.0	1.9x	1.8x	4.5x	4.7x	10.3x	11.2x
Broadcom Corp.	\$33.50	19,293.1	17,264.1	2.2x	2.0x	14.6x	8.8x	11.5x	12.0x
Altera Corp.	\$35.26	11,441.8	8,214.9	4.6x	4.5x	13.1x	13.5x	20.4x	22.8x
Xilinx Inc.	\$38.37	10,446.9	8,119.0	3.7x	3.6x	12.1x	11.4x	21.4x	20.1x
LSI Corp.	\$6.90	4,005.8	3,328.1	1.3x	1.4x	9.1x	6.3x	9.5x	11.6x
Marvell Technology	\$10.72	6,033.9	4,098.1	1.3x	1.3x	9.2x	8.0x	13.2x	13.7x
Brocade	\$5.92	2,775.9	2,992.0	1.3x	1.3x	6.1x	5.0x	9.5x	8.9x
Advanced Micro Devices	\$2.56	1,897.0	2,756.0	0.5x	0.6x	n.m.	13.2x	n.m.	n.m.
Cavium	\$38.12	1,901.7	1,870.2	8.0x	6.0x	47.3x	20.6x	n.m.	n.m.
Average excl. EZCH				2.8x	2.5x	14.5x	10.2x	13.7x	14.3x

Sources: CapitalIQ, Company Filings

(1) EZCH EPS adjusted to include \$0.39/share of annual stock-based comp expense

CAVM 2013E P/E is 100x+ after including \$0.76/share of SBC

Given the uncertainty of EZCH's growth, the company's tendency to over-exaggerate product ramps, the loss of a key customer account to in-house designs, and the entry of Broadcom and Marvell into the NPU space, we'd argue that EZCH no longer deserves a premium valuation to the industry. We also believe that EZCH's mispricing exists because most of the Street's analysts exclude EZCH's mounting stock-based compensation ("SBC") expense from EPS, thereby inflating earnings by 30%+. Over the last twelve months, EZCH spent \$11.2m on stock grants (or \$0.39/diluted share). While this might be a minor footnote for a largecap organization, it's a very major line item for EZCH. By excluding SBC, the analysts are effectively reducing EZCH operating expenses by the same amount, leading to embellished valuation multiples. After netting out this \$0.39/share of SBC to analysts' 2013E EPS estimates, we reach a GAAP earnings estimate of \$0.74/share. With the addition of 25% of EZCH's cash balance, an above average industry P/E multiple of 15x produces an \$12.50 price target and a generous 20x P/E would led to a \$16 price target, or a 32% - 48% discount to the current trading price.

EZCH bulls might reject this valuation argument by instead citing management's target of 3x revenue growth between 2012 and 2016. To construct its target, EZCH cites April 2012 research from Infonetics and its own internal sources. Gartner, a very well-regarded technology research firm, published more recent thoughts on the market in December 2012, predicting that the Edge Router and Switch market will grow by only 3.6% in 2013 and 11.3% in 2014. While this might be exciting if EZCH were trading at 10x P/E, these are hardly awe-inspiring numbers for a high-flying growth stock.

EZCH further constructs its long-term 3x revenue growth target by assuming that its average selling price ("ASP") increases by 40% and the EZCH's edge router market penetration increases from 30% to 40%, resulting in an additional 30% - 70% revenue boost (Q4 2012 *Investor Presentation*). We take issue with both of these assumptions. As Moore's Law helps explain, customers will demand higher performance at a lower cost over time. Even the high-end chip titan Intel ([INTC](#)) posted flat year-over-year growth in 2012. EZCH clearly isn't immune to this dynamic since revenue fell between 2010 and 2012 even though the next-generation NP-4 began ramping in 2H 2011 (*EZCH Q1 2011 Call*). For these reasons, we'd only credit EZCH

with an inflationary-driven ASP growth of 3%/year. We also believe that any end-market replacement of ASICs by NPUs will be overshadowed by market share losses to Broadcom, Marvell, and other potential competitors, leading us to believe that EZCH's end-market share will remain flat. By combining these two assumptions with Gartner's end-market growth of 44% between 2012 and 2016, we project 2016 revenue of only \$85m.

Gartner Edge Router Forecasts

\$mm	2012E	2013E	2014E	2015E	2016E
Edge Routers/Switches ⁽¹⁾	\$10,335.3	\$10,709.3	\$11,918.2	\$13,394.5	\$14,891.7
% YoY Growth	1.9%	3.6%	11.3%	12.4%	11.2%
Cumulative Growth					44.1%

Kerrisdale "Bull Case" 2016 Revenue Target

2012-2016 End-Market Growth	44.1%	
2012-2016 ASP Growth ⁽²⁾	12.0%	Inflationary-driven growth of 3%/year
Change in EZCH Market Share ⁽²⁾	—	Assume competitors negate penetration gains
Implied Revenue Growth	56.1%	
EZCH 2012A Revenue	\$54.7	
Implied 2016A Revenue	\$85.4	

(1) December 13th Gartner Report, "Forecast: Carrier Network Infrastructure...
...Worldwide, 2009-2016, 4Q12 Update"

(2) Kerrisdale assumption

Sources: Gartner Edge Router Forecasts, EZCH filings

At a 35%-40% GAAP EBITDA margin, the high-end of the historical trend, the 2016 revenue target of \$85m would result in only \$30 - \$34m of EBITDA. A liberally high 6x-8x forward multiple results in an enterprise value of \$179m - \$272m. After adding the current cash balance of \$168m plus \$50m for the interim cash generation, we can then infer a market capitalization target of \$400m - \$490m, or about \$14 - \$17/share.

Kerrisdale's Illustrative Valuation Range

\$m, expect per share	Valuation Range	
2013 EPS Method		
2013E GAAP EPS ⁽¹⁾	\$0.74	\$0.74
Industry Multiple	15.0x	20.0x
Implied Price	\$11.10	\$14.80
Add: 25% of Cash Balance ⁽¹⁾	1.46	1.46
Implied Price Target	\$12.56	\$16.26
% Discount to Current	(47.6%)	(32.2%)
2016 Revenue Method		
2016E Revenue	\$85.0	\$85.0
EBITDA Margin ⁽²⁾	35.0%	40.0%
Implied EBITDA	\$29.8	\$34.0
Industry Multiple	6.0x	8.0x
Implied Enterprise Value	\$178.5	\$272.0
Add: Interim Cash Generation	50.0	50.0
Implied Price Target ⁽³⁾	\$13.73	\$16.96
% Discount to Current	(42.7%)	(29.2%)

Sources: Company filings, Comparable Company Analysis, Kerrisdale estimates

(1) Technology companies do not generally return cash to shareholders

(2) Kerrisdale estimate based on historical figures

(3) Includes current cash plus Kerrisdale's estimate of cash generation through 2016

The Problem with Neglecting EZCH's Stock-based Compensation Expense

Warren Buffet, among others, has repeatedly attempted to educate investors on the lunacy of [treating SBC as a non-expense](#). In the chart below, we've shown how large of an impact stock expense has had on EZCH's results:

\$m; year-end Dec 31st	2011A				2012A			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
GAAP EPS	\$0.05	\$0.17	\$0.27	\$0.14	\$0.18	\$0.19	\$0.00	\$0.17
<i>EZChip's Adjustments</i>								
Stock-based Comp	\$2.1	\$2.1	\$2.2	\$2.2	\$2.6	\$2.8	\$2.9	\$2.9
Non-Cash Taxes	1.4	2.1	0.0	–	–	–	–	–
Amort of Purchased Tech.	0.4	0.4	0.1	0.1	0.1	0.1	0.1	0.1
Weighted Avg Diluted Shares	27.9	28.8	28.6	28.6	29.3	29.5	29.6	29.6
"Non-GAAP" EPS (excl. SBC)	\$0.19	\$0.33	\$0.35	\$0.22	\$0.27	\$0.29	\$0.10	\$0.26

Source: Company Filings.

(1) Q4 2011 GAAP EPS excludes one-time payment of \$9.9m to the Israeli gov't for prior grants.

As shown below, the figures extracted from Wall Street research match non-GAAP EPS, inflating the analysts' projections and, by association, EZCH price targets.

<u>Felt & Co.</u>				<u>RBC Capital</u>				
<u>EPS</u>	2012A	2013E	2014E					
Mar	\$0.27	\$0.23E	\$0.34E	EPS (Op) - FD				
Jun	\$0.29	\$0.26E	\$0.38E	2011	0.19A	0.33A	0.35A	0.22A
Sep	\$0.10	\$0.31E	\$0.42E	2012	0.27A	0.29A	0.10A	0.26A
Dec	\$0.26	\$0.35E	\$0.41E	Prev.				0.21E
FY	\$0.92	\$1.15E	\$1.55E	2013	0.22E	0.25E	0.30E	0.38E
P/E	27.8x	22.2x	16.5x	Prev.	0.20E	0.26E	0.32E	0.44E

Sources: Felt & Co Feb 14th, 2012 report; RBC Capital Feb 14th, 2012 report.

EZCH's Customer Concentration Makes it Susceptible to a Sudden Correction

Without a doubt, Cisco has been the savior of EZCH's stock price over the past year. The router vendor has represented between 37% to 49% of EZCH's revenue over the past four quarters and an even greater percentage of gross profits given the royalty arrangement. While investors have hitherto overlooked the competitive shifts brooding in the NPU market, they would stand at attention if EZCH lost a major customer. Should Cisco, or any of EZchip's other major customers, award an NPU contract to Broadcom in 2013, EZCH shares could experience a fate similar to that of many other overly concentrated hardware suppliers. A recent example in the technology sector is Audience ([ADNC](#)), a maker of audio processors for smart phones. Like EZchip, Audience was heavily reliant on a single customer, in this case Apple, which represented 55% of Audience's Q2 2012 revenue. After it was [announced](#) that Apple would use in-house audio processors in the iPhone 5, Audience shares experienced a one-day fall of over 60%. The chart below helps illustrate the risks involved in heavily concentrated technology suppliers.



Source: CapitalIQ

VI. Conclusion

EZCH was able to prevent a share price collapse despite its terrible 2012 results by diverting attention to the research-stage NPS chip. Never mind that the NPS product is 4+ years away from contributing meaningfully to revenue and that the underfollowed Intel spinout Netronome has a sustainable manufacturing edge. But with this trump card now played, EZCH investors and analysts have now begun to examine the looming competitive threats from Broadcom, Marvell, and in-house chip design teams. Huawei's apparent decision to select in-house designs over EZCH puts another crack in management's long-term revenue growth projections, which on further study appear to be built on little more than wishful thinking. It's not hard to imagine a scenario where Broadcom's 200Gb/s NPU wins at least one or two customers away from EZCH and confidence in the stock quickly collapses. Moreover, continued weakness in the wireline capex market should keep organic growth muted through 2013. As stated by EZCH's CEO on the Q3 earnings call, "The revenue ramp of these customers will depend on the success of their new NP-4 platforms in the market, which in turn is driven by the CapEx levels of the carriers" (Q3 Earnings Call). These very basic end-market and competitive concerns lead us to believe that EZCH's sky-high 32.5x 2013E P/E is simply unsustainable.

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