Cut PT to $120 July 08, 2024

MU: Peak earnings + nascent worries = downside risk

LYNX EQUITY STRATEGIES

KC Rajkumar, CFA, PhD
(408) 425-5680
KC@LynxEq.com

*A quarter ago when we raised our FY25 eps estimate to ~$12 (link) and with consensus estimates at ~$7, we felt it appropriate to value the stock at $150 by applying a 12x multiple, in the upper half of historical range. With the stock having hit out PT, and with Street eps estimates now likely at peak earnings, we think it **reasonable to consider applying a lower** multiple to the stock.*

*MU management reiterated its outlook that HBM capacity is sold out though Cy25. With HBM pricing through Cy25 have having been contracted out and with little intention by management to increase DRAM bit supply during the Fy25 capex cycle, **we do not see further upside** to FY25 DRAM consensus estimates. Management's outlook for HBM revenue in the 'multiple $billions' was modeled into estimates ahead of the earnings call. Management's outlook for record overall revenue in Fy25 was already dialed in a quarter ago when consensus revenue estimate was at $32.6bn vs. previous peak of $30bn. Fy25 revenue estimates now run more than $10bn above the previous high sent of $30bn in Fy18. At the recent earnings call, management did little to coax up Fy25 estimates. Given the visibility management provided, we think Street expectations could be closing in on peak earnings*

*Meanwhile, **nascent worries** have descended on investors' minds. **1)** August guidance came in under buyside expectations, with no clear reason from the Street for the shortfall. We provide a possible reason for the guidance miss – Share loss in Mobile DRAM to Samsung. **2)** More worrisome are the emerging concerns on HBM yield, which management did not quite snuff out during the call, in our view. Going into the call we had warned of a 'wrinkle in the AI narrative' and that management may not provide adequate clarity. Unlike many on the Street, going into the call, we pointedly did NOT raise our PT. We fear the issues could be related to NVDA's **H200 ramp**, which MU may have little control over.*

*We believe the Street has pulled forward the ramp in revenue/margins expected for the next 12-18 months. As such we think the stock should be trading at multiple associated with peak eps (10x or lower) and not trough eps (12x or higher). Based on peak earnings and nascent yield worries, we cut our eps multiple to **10x**. At our FY25 estimates of $39.5bn/$11.8, **we cut our PT to $120** from $150.*

We note that in the Fy18 cycle, with eps peak at $12, the stock peaked at ~$60. In this cycle, we think eps potential needs to be substantially higher than $12-$14 for the stock to trade more than 2x the previous stock peak set during the previous DRAM surge.

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Odd statements leave investors guessing: At the top of the Q&A session, in response to a question, the CEO stated 'we are very much focused on continuing to ramp our [HBM] production and also to **improve our yields'**. This may sound like a banal enough statement, except that the question was not about HBM yields.

Rather, the question was about qualifying HBM3e for a broader base of customers beyond NVDA. Instead of providing an answer to this question, the CEO's statement on yields sounded **more like a disclosure**, perhaps lending credence to yield-relayed chatter that had been circulating on the Street before the earnings call.

Then there is the matter of HBM '**trade ratio**'. When management says it takes 3x the DRAM wafers to get to a given target for HBM bits output versus the wafers required for traditional D5 bits, does this 'trade ratio' refer to loss of bits MU incurs **before** shipping HBM3e product to NVDA? Or does it refer to loss of HBM bits at **packaging and testing** of the H200 module at NVDA? Who bears the cost of loss of DRAM bits? MU or NVDA?

Our view on yield issues: While yield loss at CoWoS packaging has been known for a while, we are coming around to believe that there could be additional yield loss of NVDA's module (GPU and HBM) during the testing of H200 modules. The H200 module perhaps has some of the **highest current densities** ever recorded in electronic devices, we believe higher than that in H100. Even though the NVDA GPU module is cooled during operation, challenges in heat-dissipation could be higher than previously anticipated, leading to **heating-related failures**.

During the initial stages of the product ramp, perhaps it is a matter of testing enough number of H200 modules to filter in working devices. But as the unit volume ramps the logistic of testing devices could turn into an exponential problem, slowing down output and the **pace of revenue ramp**. There was little on the MU call that gave us confidence that yield issues do not exist. We think the management's odd statement at the top of the Q&A session is **cautionary**.

If the HBM trade ratio were to **decrease**, as yields improve, wouldn't that increase bit supply and reduce MU's profitability? If the trade ratio were to **increase** above 3x, wouldn't the additional yield loss raise concerns with NVDA's data center customers about reliability of H200?

Is there upside to HBM revenue expectations? We do not think so. **1)** Management stated that HBM is sold out for Cy24 and Cy25, **2)** further pricing increase of HBM is unlikely as pricing has been contracted out for Cy25, **3)** further increase of HBM output is unlikely as little of the Fy25 capex has been allocated to bit supply growth. Even if NVDA were to increase its demand forecast for HBM, we do not see how MU would be able to increase output or pricing. **4)** Samsung's potential entry into the HBM market as some point in the next 6-12 months could dilute MU's share if not at H200 but possibly at B100. Recall that B100 is expected start ramping in CQ4/CQ1.

Management reiterated the Fy25 guidance for HBM at 'several $billions'. Heading into earnings, we think Street models already dialed in HBM revenue north of $5bn, and perhaps quite a bit higher. In this context, reiteration at the earnings event of 'several $billions' does little to move the needle.

Management spoke of overall revenue setting a 'substantial revenue record' in Fy25. But with sell-side models already at or slightly above ~$40bn versus the previous revenue record of $30bn in Fy18, management's outlook does not move the needle.

Why did Aug guidance miss enhanced expectations? We think this is in part due to weakness in MU's **mobile business** arising from China's import policy. We believe the **surprising strength in Samsung's** reported Q2 revenue/profitability comes, not from AI end market, but from share gain in China's mobile DRAM market.

Due to restrictions imposed by the China government, we think there is **excess inventory** of MU's lpDDR5 in the disti channel. So much so, we believe that MU's lpDDR5's disti pricing is **lowe**r than lpDDR4's pricing. Under normal channel inventory conditions, the lpD5 should be priced higher than lpD4.

Due to China import policy restrictions on MU, we think China mobile handset vendors prefer Samsung's lpDRR5 over MU's, even for handsets allocated for export purposes. Oppo/Vivo/Xiaomi provide ~30% of global smartphone units. China's policy largely locks MU out of this market. Due to weak sell-thru, we think lpDRR5 inventory at China distis has been building up for a while. We think MU decided to cut sell-in in May and Aug quarter to normalize disti inventory.

We think lpDRR5 channel inventory resulted in MU's Mobile segment revenue in the May quarter printing **down 1% q/q**, while each of the other 3 segments reported revenue **up** for the quarter. We think MU's overall DRAM bits printing down ~7% q/q is largely due to decline in lpD5 bits sold into China's mobile market. We do not expect lpDRR5 demand in China distis to normalize until China's import policy changes.

The next positive catalyst for the stock is the upcoming **TSM earnings event**. We expect TSM to sound **enthusiastically positive** on AI revenue potential for the rest of the year, which will be seen as a positive read-thru for MU's HBM. While the stock may make another attempt to cut above the previous high, we expect the drive to stall, as worries regarding revenue ramp at HBM/H200 persist.

The arc of our PT changes: We started raising our MU PT right after NVDA's April'23 earnings on the basis of HBM potential (link) when there still was considerable inventory in DRAM channel. Into MU's Nov'23 earnings, we spoke of a sudden 'urgency' in the DRAM channel, as DRAM customers began to sense a tightening of supply. We called for upside to our $80 PT (link). Three months later, into the Feb'24 earnings, and with the stock in the mid-$90s, we raised our PT sharply to $150 (link) into our expectations of MU essentially becoming tied at the hip to the 2nd phase of NVDA's AI GPU ramp. Three short months later, into the Apr'24 earnings, with the stock having hit our PT, we decided **not** to raise our PT into Apr'24 (link).

The velocity at which consensus earnings expectations have risen, we think expectations may have become over-extended. We might even say HBM expectations may have entered **bubble territory**. With little upside to Fy25 estimates and with nascent yield worries, we think it appropriate now to **cut our PT for the first time this cycle**.

Net/Net: The months of May/June witnessed a series of positive catalysts from the AI ecosystem, all through which MU stock ran up, finally stalling at our previous PT of $150. At the earnings event two weeks ago, MU management did not provide incremental guidance for taking up Street's Fy25 revenue estimates. Additionally, investors were left with **nascent worries** about HBM yield and qualification.

We expect the stock to remain volatile as it ricochets between 1) positive commentary from MU/TSM/NVDA management regarding demand pull from hyperscale customers and 2) investor worries about the pace of HBM/H200 ramp.

We believe the Street has pulled forward ramp in revenue/margins expected for the next 12-18 months. Based on peak earnings, nascent worries on HBM yield and the potential for a slower ramp of HBM revenue, we cut our eps multiple to 10x. At our FY25 estimates of $39.5bn/$11.8, **we cut out PT to $120** from our previous PT of $150.

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