

U.S. Semiconductors

PC Pulse: May 2022 – Another NB Miss, Shutdowns the Largest Factor but Demand Likely Softened as Well

May NBs again came in below, with shutdowns the headline but demand likely also slowing with further cracks in Consumer (material miss at Quanta). This is just the beginning in our view, as we continue to believe the PC correction is just getting started.

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Weaker NB results in May (-19% Y/Y) and a reduced outlook for Q2 despite several ODMs acknowledging incremental supply improvement as production in China resumed. The majority of ODMs still guide the year flattish to down slightly, which strikes us as overly optimistic given NBs are tracking down 15% Y/Y on a YTD basis. Consumer clearly remains pressured as evidenced by the substantial miss at Quanta this month (>1M units below our estimate). We are once again cutting our FY numbers to reflect the weaker May and a less optimistic outlook for the balance of the year. **Implications:** Clearly a negative for **INTC** and **AMD**. INTC took a cautionary tone this week signaling some risk to its June guide. We do believe INTC has more inventory to work through in the channel given such a strong Q420/Q121 but we don't see how AMD is immune to this softness despite their reiteration of their guidance and down HSD outlook for the market. AMD's June is likely safe but we still see corrections needed in its segments outside of the Data Center into next year. For INTC, we are intrigued that they may finally be resetting the bar enough but we just don't see a catalyst for the stock with the market softening.

May Below on Continued Consumer Weakness: May NBs of 11.5M (+22% M/M) missed our estimate of 12.6M (+34% M/M), largely driven by Quanta (4M vs. our 5.2M). This also comes despite several players having pointed out improvement in production in Shanghai and Kunshan. We are reducing our Q2 NB forecast to 36.7M (-12% Q/Q), below our prior 37.5M. 2022 guidance from most ODMs is still flattish to down slightly Y/Y, but we see this ultimately being worse. We are taking down our 2022 NB forecast to -12% Y/Y (from -11%). Moving to MBs, May came in roughly in line at 2.4M (-5% M/M), with misses at Pegatron and Gigabyte largely offset by beats at Elitigroup and Microstar. Our MB Q2 estimate remains at 7.6M (-9% Q/Q) and our 2022 forecast at -9% Y/Y.

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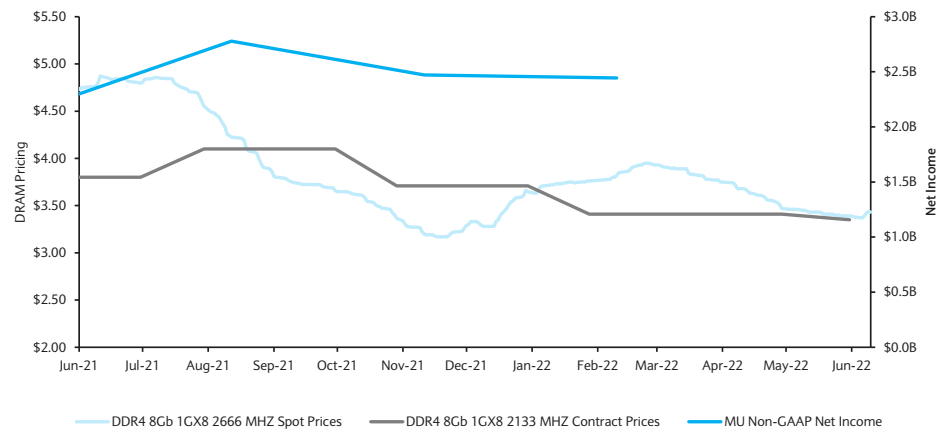
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FIGURE 1. Monthly Results & Changes to Estimates Summary (units in 000s)

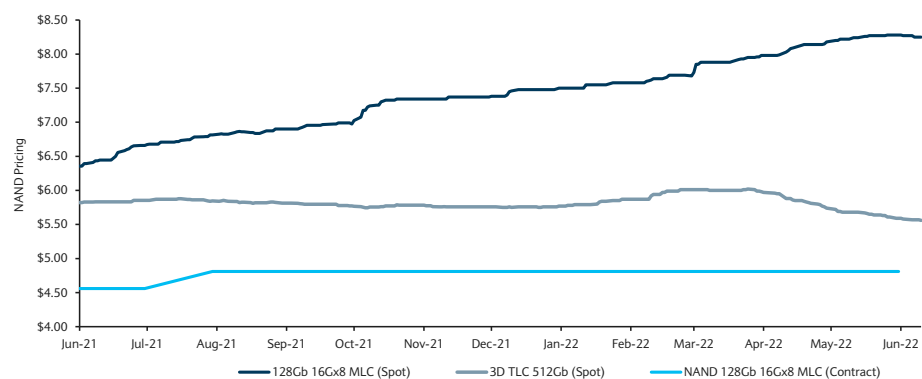
May Monthly Results & Updated June and Quarterly Estimates							
Taiwanese ODMs	May Actual	Barclays Prior Est.	June Forecast	Barclays Prior Est.	2Q22 Forecast	Barclays Prior Est.	3Q22 Forecast
Top 5 NB ODM	11,500	12,600	15,800	15,450	36,725	37,475	43,158
MoM; QoQ	+22%	+34%	+37%	+23%	-12%	-10%	+18%
Top 4 MB ODM	2,358	2,375	2,700	2,750	7,552	7,619	8,970
MoM; QoQ	-5%	-5%	+15%	+16%	-9%	-8%	+19%
Combined	13,858	14,975	18,500	18,200	44,277	45,094	52,127
MoM; QoQ/YoY	+16%	+26%	+33%	+22%	-11% / -19%	-10% / -17%	+18% / -8%

Source: Company Reports and Barclays Research

DRAM Spot Down/NAND Mixed: DRAM spot was down 1% M/M (-12% over the last 3 months), with contract down 2% M/M (-2% over the last 3 months). For NAND, 128GB MLC spot was flat M/M (+5% over last 3 months) as was contract pricing (also flat over the last 3 months). 3D TLC 512GB NAND spot was down 2% M/M (-7% over the last 3 months).

FIGURE 2. DRAM Spot vs. Contract Pricing

Source: Company Reports, DRAMeXchange, and Barclays Research

FIGURE 3. NAND Spot vs. Contract Pricing

Source: Company Reports, DRAMeXchange, and Barclays Research

Implications for Hardware - HPQ, DELL, AAPL: May ODMs missed our estimates again driven by NBs with continued component supply and logistics constraints related to Shanghai lockdowns, but this is likely masking deteriorating demand profile. May NBs of 11.5M (up 22% M/M and down 19% Y/Y) missed our previous estimate of 12.6M. Quanta once again underperformed as it is levered to Consumer/Education which is cracking. MBs missed by 1%. We remain in the camp that there is more of a correction coming, but it likely needs to start showing up in weaker ASPs. For 2022, ODMs still project flat to down outlooks for builds which

we view as too optimistic. We expect a reversion to start at some point along with tougher compares as we doubt this elevated rate of PCs is sustainable. We don't think enterprise resilience is enough to offset consumer/education weakness (60% of PC mkt). We still believe the PC market is above trend in the long run while current supply constraints could be masking underlying demand weakness. We are interested to see how builds trend over the next few months as lockdown/supply eases. However, Chromebook growth has slowed meaningfully. Chromebooks had a huge bounce on learn from home, but that seems to be over. Just like in Smartphones, the low end is the first to correct. We are expecting units to get back to 300M in 2023 as the replacement rate for both consumer and commercial normalizes. At some point mid/high tier should be affected. We still believe when component availability comes back, and macro pressures persist, there will be a reversion in ASPs. Both HPQ and DELL have been enjoying the higher prices for a year now. We expect AAPL to have flat growth in Macs for 2022 as compares get more difficult and it laps Covid tailwinds. PC growth should also decelerate as we model 5.7% growth Y/Y for the Jul-Q for HPQ, vs. 9.3% growth for Apr-Q. For Jul-Q for Dell, we are modeling 4% Q/Q decline and 5% growth Y/Y, also a deceleration from prior quarters. We project Dell PC revenue growth to be up 2.9% Y/Y for FY23 and flattish for FY24. We expect 6.1% Y/Y growth for HPQ for FY22 before reverting lower to a 2.5% decline for FY23. Dell has roughly 77% exposure to commercial/enterprise, which has tailwinds, above 50/50 commercial/consumer split for the industry, and above 65% commercial mix for HPQ. Dell gained share recently, at the expense of HPQ.

FIGURE 4. Q/Q Unit Shipments - PC vs. MPU vs. NB & Motherboards

Quarterly unit in '000	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22E	3Q22E	4Q22E	1Q23E	2Q23E	3Q23E	4Q23E	2020	2021	2022E	2023E
Taiwanese NB and Motherboard shipments																
Top 5 NB ODM	44,550	45,500	47,850	52,100	41,635	36,725	43,158	45,315	38,677	40,373	42,953	40,805	158,020	190,000	166,833	162,808
Top 4 MB ODM	9,930	8,913	8,658	9,732	8,291	7,552	8,970	8,906	7,660	8,043	8,687	8,252	38,425	37,233	33,719	32,643
Total NB and Motherboard	54,480	54,413	56,508	61,832	49,926	44,277	52,127	54,221	46,338	48,416	51,640	49,058	196,445	227,233	200,552	195,451
Q/Q	-9%	0%	4%	9%	-19%	-11%	18%	4%	-15%	4%	7%	-5%				
Historical Seasonality	-17%	9%	7%	0%	-15%	9%	6%	0%	-15%	6%	6%	2%				
Y/Y	72%	8%	4%	3%	-8%	-19%	-8%	-12%	-7%	9%	-1%	-10%	21%	16%	-12%	-3%
MPU Shipments																
NB MPU*	78,623	74,440	55,165	56,300	52,700	51,295	55,720	59,400	51,011	48,431	50,210	48,481	247,100	264,528	219,115	198,134
MB MPU	21,313	19,800	21,600	24,000	18,450	17,485	18,597	19,498	17,849	18,089	18,711	18,604	81,942	86,713	74,031	73,253
ARM	4,150	4,601	5,632	6,200	5,950	5,556	6,833	8,350	6,105	6,436	7,974	8,416	5,194	20,583	26,689	28,930
Total NB+DT MPU	104,085	98,841	82,397	86,500	77,100	74,337	81,150	87,248	74,964	72,956	76,895	75,501	334,235	371,823	319,835	300,316
Q/Q	-2%	-5%	-17%	5%	-11%	-4%	9%	8%	-14%	-3%	5%	-2%				
Historical Seasonality	-8%	3%	11%	0%	-7%	3%	10%	2%	-8%	3%	8%	5%				
Y/Y	44%	37%	-2%	-18%	-26%	-25%	-2%	1%	-3%	-2%	-5%	-13%	22%	11%	-14%	-6%
PC Sales																
WW NB PC	63,279	61,923	63,819	67,731	58,609	59,344	59,031	57,104	52,354	50,832	54,835	61,599	219,917	256,752	234,088	219,620
WW DT PC	19,881	20,643	21,335	23,246	20,176	19,420	20,709	21,243	19,767	19,830	20,950	19,573	78,599	85,104	81,549	80,120
Total PC Shipments	83,160	82,566	85,153	90,976	78,785	78,764	79,740	78,348	72,120	70,662	75,785	81,172	298,516	341,856	315,637	299,740
Q/Q	-8%	-1%	3%	7%	-13%	0%	1%	-2%	-8%	-2%	7%	7%				
Historical Seasonality	-15%	3%	10%	3%	-14%	3%	10%	4%	-14%	1%	10%	3%				
Y/Y	56%	13%	4%	1%	-5%	-5%	-6%	-14%	-8%	-10%	-5%	4%	14%	15%	-8%	-5%

*Includes x86 Tablet MPU Shipments

Source: Company Reports and Barclays Research

FIGURE 5. Top Four Taiwanese Motherboard ODM Monthly Shipments (Ks of Units)

Top Four Taiwanese Motherboard ODM Monthly Shipments (Ks of Units)																		E
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Pegatron																		
Shipment	575	475	660	625	620	625	610	575	575	610	710	725	675	500	725	550	425	450
MoM/QoQ %	(15%)	(17%)	39%	(5%)	(1%)	1%	(2%)	(6%)	0%	6%	16%	2%	(7%)	(26%)	45%	(24%)	(23%)	6%
Historical Seasonality	0%	(11%)	25%	5%	(16%)	7%	2%	(5%)	8%	1%	(4%)	(6%)	10%	(2%)	17%	(4%)	(10%)	4%
YoY %	(4%)	(32%)	(12%)	(17%)	55%	19%	22%	15%	0%	2%	(2%)	7%	17%	5%	10%	(12%)	(31%)	(28%)
Gigabyte																		
Shipment	1,300	920	1,200	1,173	910	860	800	905	1,055	950	1,100	925	1,100	750	900	675	650	850
MoM/QoQ %	37%	(29%)	30%	(2%)	(22%)	(5%)	(7%)	13%	17%	(10%)	16%	(16%)	19%	(32%)	20%	(25%)	(4%)	31%
Historical Seasonality	46%	(21%)	26%	(10%)	5%	7%	2%	6%	(3%)	(19%)	31%	(26%)	41%	(16%)	24%	(8%)	(4%)	10%
YoY %	37%	31%	9%	30%	(9%)	(22%)	(30%)	(35%)	(25%)	(24%)	(10%)	(3%)	(15%)	(18%)	(25%)	(42%)	(29%)	(1%)
Elitegroup																		
Shipment	550	450	550	550	450	450	331	456	501	434	402	626	385	278	428	519	533	550
MoM/QoQ %	(15%)	(18%)	22%	0%	(18%)	0%	(26%)	38%	10%	(13%)	(7%)	56%	(38%)	(28%)	54%	21%	3%	3%
Historical Seasonality	14%	(34%)	98%	17%	(3%)	31%	(5%)	(7%)	6%	(9%)	(4%)	(10%)	59%	(32%)	53%	24%	(13%)	15%
YoY %	69%	260%	83%	(15%)	(31%)	(31%)	(40%)	(30%)	(9%)	(4%)	(27%)	(4%)	(30%)	(38%)	(22%)	(6%)	18%	22%
Microstar																		
Shipment	1,250	850	1,150	950	850	850	750	950	1,150	1,050	1,150	1,050	950	650	950	750	750	850
MoM/QoQ %	32%	(32%)	35%	(17%)	(11%)	0%	(12%)	27%	21%	(9%)	10%	(9%)	(10%)	(32%)	46%	(21%)	0%	13%
Historical Seasonality	32%	(21%)	18%	1%	(0%)	12%	4%	(8%)	2%	(8%)	8%	(17%)	33%	(19%)	19%	(7%)	0%	11%
YoY %	47%	13%	21%	12%	(11%)	(26%)	(38%)	(14%)	10%	0%	10%	11%	(24%)	(24%)	(17%)	(21%)	(12%)	0%
Top 4																		
Shipment	3,675	2,695	3,560	3,298	2,830	2,785	2,491	2,886	3,281	3,044	3,362	3,326	3,110	2,178	3,003	2,494	2,358	2,700
MoM/QoQ %	14%	(27%)	32%	(7%)	(14%)	(2%)	(11%)	16%	14%	(7%)	10%	(1%)	(6%)	(30%)	38%	(17%)	(5%)	15%
Historical Seasonality	19%	(20%)	30%	(2%)	(4%)	12%	1%	(4%)	3%	(9%)	4%	(16%)	31%	(17%)	22%	(4%)	(6%)	9%
YoY %	35%	18%	15%	5%	(6%)	(19%)	(27%)	(21%)	(8%)	(9%)	(5%)	3%	(15%)	(19%)	(16%)	(24%)	(17%)	(3%)

Source: Company Reports and Barclays Estimates

FIGURE 6. Top Four Taiwanese Motherboard ODM Quarterly Shipments (Ks of Units)

Top Four Taiwanese Motherboard ODM Quarterly Shipments (Ks of Units)															
	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23	2021	2022	2023
Pegatron															
Shipment	1,710	1,870	1,760	2,045	1,900	1,425	1,924	2,212	1,770	1,858	2,007	1,907	7,385	7,461	7,542
MoM/QoQ %	(15%)	9%	(6%)	16%	(7%)	(25%)	35%	15%	(20%)	5%	8%	(5%)			
Historical Seasonality	(15%)	7%	(2%)	2%	(14%)	7%	(2%)	4%	(12%)	7%	(0%)	10%			
YoY %	(17%)	12%	12%	2%	11%	(24%)	9%	8%	(7%)	30%	4%	(14%)	1%	1%	1%
Gigabyte															
Shipment	3,420	2,943	2,760	2,975	2,750	2,175	2,501	2,376	2,091	2,196	2,371	2,253	12,098	9,802	8,911
MoM/QoQ %	(0%)	(14%)	(6%)	8%	(8%)	(21%)	15%	(5%)	(12%)	5%	8%	(5%)			
Historical Seasonality	2%	(2%)	11%	(14%)	2%	(2%)	4%	(14%)	2%	(3%)	9%	(14%)			
YoY %	24%	(2%)	(30%)	(13%)	(20%)	(26%)	(9%)	(20%)	(24%)	1%	(5%)	(5%)	(8%)	(19%)	(9%)
Elitegroup															
Shipment	1,550	1,450	1,288	1,462	1,091	1,602	1,842	1,750	1,540	1,617	1,747	1,659	5,750	6,285	6,563
MoM/QoQ %	(6%)	(6%)	(11%)	14%	(25%)	47%	15%	(5%)	(12%)	5%	8%	(5%)			
Historical Seasonality	(21%)	6%	1%	(3%)	(21%)	3%	1%	(3%)	(21%)	6%	1%	(5%)			
YoY %	107%	(26%)	(26%)	(11%)	(30%)	10%	43%	20%	41%	1%	(5%)	(5%)	(6%)	9%	4%
Microstar															
Shipment	3,250	2,650	2,850	3,250	2,550	2,350	2,703	2,567	2,259	2,372	2,562	2,434	12,000	10,170	9,628
MoM/QoQ %	7%	(18%)	8%	14%	(22%)	(8%)	15%	(5%)	(12%)	5%	8%	(5%)			
Historical Seasonality	(4%)	0%	13%	(8%)	(4%)	0%	12%	(8%)	(4%)	0%	13%	(8%)			
YoY %	27%	(10%)	(15%)	7%	(22%)	(11%)	(5%)	(21%)	(11%)	1%	(5%)	(5%)	1%	(15%)	(5%)
Top 4															
Shipment	9,930	8,913	8,658	9,732	8,291	7,552	8,970	8,906	7,660	8,043	8,687	8,252	37,233	33,719	32,643
MoM/QoQ %	(2%)	(10%)	(3%)	12%	(15%)	(9%)	19%	(1%)	(14%)	5%	8%	(5%)			
Historical Seasonality	(8%)	4%	7%	(5%)	(7%)	4%	5%	(5%)	(8%)	1%	7%	(4%)			
YoY %	23%	(7%)	(19%)	(4%)	(17%)	(15%)	4%	(8%)	(8%)	7%	(3%)	(7%)	(3%)	(9%)	(3%)

Source: Company Reports and Barclays Estimates

FIGURE 7. Top Five Taiwanese NB ODM Monthly Shipments (Ks of Units)

Top Five Taiwanese NB ODM Monthly Shipments (Ks of Units)																		E
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Quanta																		
Shipment	6,400	6,000	6,600	6,100	6,200	6,700	5,900	5,500	6,000	6,100	7,000	6,800	6,000	4,800	6,100	3,200	4,000	6,000
MoM/QoQ %	(10%)	(6%)	10%	(8%)	2%	8%	(12%)	(7%)	9%	2%	15%	(3%)	(12%)	(20%)	27%	(48%)	25%	50%
Historical Seasonality	(27%)	(29%)	128%	(11%)	18%	9%	(7%)	11%	7%	(8%)	4%	3%	(23%)	(26%)	113%	(4%)	11%	9%
YoY %	220%	445%	57%	33%	32%	29%	5%	(13%)	(6%)	2%	6%	(4%)	(6%)	(20%)	(8%)	(48%)	(35%)	(10%)
Compal																		
Shipment	4,300	3,300	5,500	4,400	3,800	4,800	4,900	4,700	5,700	5,100	5,300	5,600	3,600	3,600	4,600	2,200	3,300	4,800
MoM/QoQ %	(25%)	(23%)	67%	(20%)	(14%)	26%	2%	(4%)	21%	(11%)	4%	6%	(36%)	0%	28%	(52%)	50%	45%
Historical Seasonality	(29%)	(8%)	80%	(5%)	9%	11%	(14%)	(5%)	17%	0%	(4%)	10%	(26%)	(23%)	91%	(4%)	(4%)	12%
YoY %	72%	106%	49%	2%	(10%)	20%	23%	34%	39%	(7%)	15%	(2%)	(16%)	9%	(16%)	(50%)	(13%)	0%
Wistron																		
Shipment	1,700	1,500	2,200	2,000	1,800	2,300	2,000	2,100	2,500	2,300	2,500	2,700	1,700	1,600	2,300	1,600	1,900	2,400
MoM/QoQ %	(26%)	(12%)	47%	(9%)	(10%)	28%	(13%)	5%	19%	(8%)	9%	8%	(37%)	(6%)	44%	(30%)	19%	26%
Historical Seasonality	(28%)	(11%)	61%	(19%)	15%	24%	(16%)	(0%)	20%	(2%)	(0%)	1%	(28%)	(14%)	62%	(10%)	3%	24%
YoY %	70%	76%	29%	18%	6%	28%	18%	31%	32%	15%	19%	17%	0%	7%	5%	(20%)	6%	4%
Inventec																		
Shipment	1,600	1,500	1,700	1,600	1,600	1,800	1,900	2,000	2,000	1,800	2,000	1,800	1,500	1,500	2,000	1,800	1,700	1,700
MoM/QoQ %	(11%)	(6%)	13%	(6%)	0%	13%	6%	5%	0%	(10%)	11%	(10%)	(17%)	0%	33%	(10%)	(6%)	0%
Historical Seasonality	(22%)	(31%)	140%	(5%)	13%	10%	(13%)	10%	2%	(9%)	0%	4%	(16%)	(33%)	133%	(0%)	(0%)	16%
YoY %	33%	275%	(6%)	(20%)	(6%)	(10%)	0%	5%	5%	6%	18%	0%	(6%)	0%	18%	13%	6%	(6%)
Pegatron																		
Shipment	675	575	1,000	750	775	875	750	900	1,000	1,000	1,100	1,000	775	560	1,000	625	600	900
MoM/QoQ %	(21%)	(15%)	74%	(25%)	3%	13%	(14%)	20%	11%	0%	10%	(9%)	(23%)	(28%)	79%	(38%)	(4%)	50%
Historical Seasonality	(16%)	(39%)	41%	17%	13%	(2%)	(0%)	10%	9%	9%	(6%)	(5%)	(19%)	(33%)	58%	16%	12%	5%
YoY %	17%	53%	74%	(19%)	(30%)	(13%)	(25%)	(14%)	0%	14%	26%	18%	15%	(3%)	0%	(17%)	(23%)	3%
Top 5																		
Shipment	14,675	12,875	17,000	14,850	14,175	16,475	15,450	15,200	17,200	16,300	17,900	17,900	13,575	12,060	16,000	9,425	11,500	15,800
MoM/QoQ %	(17%)	(12%)	32%	(13%)	(5%)	16%	(6%)	(2%)	13%	(5%)	10%	0%	(24%)	(11%)	33%	(41%)	22%	37%
Historical Seasonality	(26%)	(22%)	90%	(8%)	13%	11%	(11%)	4%	11%	(4%)	(1%)	4%	(23%)	(25%)	88%	(3%)	3%	12%
YoY %	102%	198%	42%	10%	6%	18%	9%	6%	12%	2%	13%	1%	(7%)	(6%)	(6%)	(37%)	(19%)	(4%)

Source: Company Reports and Barclays Estimates

FIGURE 8. Top Five Taiwanese NB ODM Quarterly Shipments (Ks of Units)

Top Five Taiwanese NB ODM Quarterly Shipments (Ks of Units)					E	E	E	E	E	E	E	E	E	E	E
	1Q21	2Q21	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23	2021	2022	2023
Quanta															
Shipment	19,000	19,000	17,400	19,900	16,900	13,200	15,180	15,939	13,708	14,256	15,111	14,356	75,300	61,219	57,430
MoM/QoQ %	(4%)	0%	(8%)	14%	(15%)	(22%)	15%	5%	(14%)	4%	6%	(5%)			
Historical Seasonality	(23%)	12%	8%	(3%)	(21%)	12%	8%	(3%)	(21%)	12%	8%	1%			
YoY %	160%	31%	(5%)	1%	(11%)	(31%)	(13%)	(20%)	(19%)	8%	(0%)	(10%)	26%	(19%)	(6%)
Compal															
Shipment	13,100	13,000	15,300	16,000	11,800	10,300	12,875	13,519	11,491	11,951	12,668	12,034	57,400	48,494	48,143
MoM/QoQ %	(17%)	(1%)	18%	5%	(26%)	(13%)	25%	5%	(15%)	4%	6%	(5%)			
Historical Seasonality	(16%)	12%	5%	(1%)	(18%)	12%	8%	(1%)	(19%)	4%	8%	3%			
YoY %	68%	4%	32%	1%	(10%)	(21%)	(16%)	(16%)	(3%)	16%	(2%)	(11%)	20%	(16%)	(1%)
Wistron															
Shipment	5,400	6,100	6,600	7,500	5,600	5,900	6,785	7,124	6,056	6,298	6,676	6,342	25,600	25,409	25,371
MoM/QoQ %	(16%)	13%	8%	14%	(25%)	5%	15%	5%	(15%)	4%	6%	(5%)			
Historical Seasonality	(20%)	10%	9%	(2%)	(20%)	12%	9%	2%	(20%)	11%	9%	4%			
YoY %	52%	17%	27%	17%	4%	(3%)	3%	(5%)	8%	7%	(2%)	(11%)	26%	(1%)	(0%)
Inventec															
Shipment	4,800	5,000	5,900	5,600	5,000	5,200	5,980	6,279	5,337	5,657	6,110	5,804	21,300	22,459	22,909
MoM/QoQ %	(8%)	4%	18%	(5%)	(11%)	4%	15%	5%	(15%)	6%	8%	(5%)			
Historical Seasonality	(18%)	14%	4%	0%	(18%)	9%	4%	(2%)	(14%)	9%	9%	0%			
YoY %	41%	(12%)	4%	8%	4%	4%	1%	12%	7%	9%	2%	(8%)	6%	5%	2%
Pegatron															
Shipment	2,250	2,400	2,650	3,100	2,335	2,125	2,338	2,454	2,086	2,211	2,388	2,269	10,400	9,252	8,955
MoM/QoQ %	(13%)	7%	10%	17%	(25%)	(9%)	10%	5%	(15%)	6%	8%	(5%)			
Historical Seasonality	(24%)	(1%)	6%	24%	(24%)	(1%)	9%	24%	(24%)	(2%)	10%	20%			
YoY %	48%	(21%)	(13%)	19%	4%	(11%)	(12%)	(21%)	(11%)	4%	2%	(8%)	2%	(11%)	(3%)
Top 5															
Shipment	44,550	45,500	47,850	52,100	41,635	36,725	43,158	45,315	38,677	40,373	42,953	40,805	190,000	166,833	162,808
MoM/QoQ %	(10%)	2%	5%	9%	(20%)	(12%)	18%	5%	(15%)	4%	6%	(5%)			
Historical Seasonality	(18%)	9%	7%	1%	(18%)	9%	7%	1%	(19%)	8%	7%	3%			
YoY %	89%	11%	9%	5%	(7%)	(19%)	(10%)	(13%)	(7%)	10%	(0%)	(10%)	20%	(12%)	(2%)

Source: Company Reports and Barclays Estimates

Analyst(s) Certification(s):

We, Blayne Curtis and Tim Long, hereby certify (1) that the views expressed in this research report accurately reflect our personal views about any or all of the subject securities or issuers referred to in this research report and (2) no part of our compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report.

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Advanced Micro Devices (AMD, 09-Jun-2022, USD 98.80), Equal Weight/Neutral, A/CD/CE/E/J/K/L/M

Apple, Inc. (AAPL, 09-Jun-2022, USD 142.64), Equal Weight/Neutral, A/CD/CE/D/J/K/L/M/N

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Dell Technologies Inc. (DELL, 09-Jun-2022, USD 50.35), Equal Weight/Neutral, A/D/E/J/K/L/M/N

HP Inc. (HPQ, 09-Jun-2022, USD 36.67), Underweight/Neutral, CD/CE/E/J/K/L/M/N

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Overweight - The stock is expected to outperform the unweighted expected total return of the industry coverage universe over a 12-month investment horizon.

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IT Hardware and Communications Equipment

Apple, Inc. (AAPL)	Arista Networks, Inc. (ANET)	Casa Systems (CASA)
Ciena Corporation (CIEN)	Cisco Systems, Inc. (CSCO)	Corning Incorporated (GLW)
Dell Technologies Inc. (DELL)	F5, Inc. (FFIV)	Harmonic, Inc. (HLIT)
Hewlett Packard Enterprise Company (HPE)	HP Inc. (HPQ)	Juniper Networks, Inc. (JNPR)
Keysight Technologies, Inc. (KEYS)	Motorola Solutions, Inc. (MSI)	NetApp, Inc. (NTAP)
Pure Storage, Inc. (PSTG)	Samsung Electronics Co., Ltd. (005930.KS)	Ubiquiti, Inc. (UI)

U.S. Semiconductors

Advanced Micro Devices (AMD)	Allegro Microsystems (ALGM)	Analog Devices (ADI)
Broadcom Inc. (AVGO)	Cirrus Logic Inc. (CRUS)	Coherent Inc. (COHR)
II-VI Incorporated (IIVI)	Intel Corp. (INTC)	Lumentum Holdings Inc. (LITE)
MACOM Technology Solutions Holdings, Inc. (MTSI)	Marvell Technology Group, Ltd. (MRVL)	Micron Technology, Inc. (MU)
NVIDIA Corp. (NVDA)	NXP Semiconductors NV (NXPI)	Ouster, Inc (OUST)
Qorvo Inc. (QRVO)	QUALCOMM, Inc. (QCOM)	Seagate Technology plc (STX)
SGH (SGH)	Silicon Laboratories, Inc. (SLAB)	SiTime Corporation (SITM)
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Advanced Micro Devices (AMD / AMD)

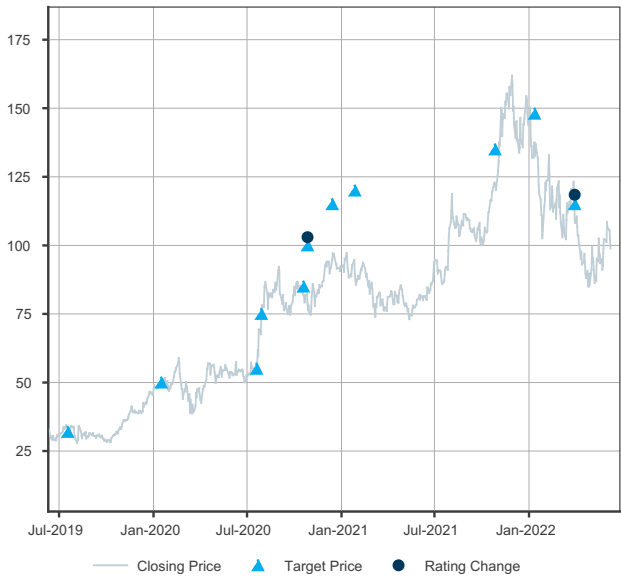
Stock Rating: **EQUAL WEIGHT**

Industry View: **NEUTRAL**

USD 98.80 (09-Jun-2022)

Rating and Price Target Chart - USD (as of 09-Jun-2022)

Currency=USD



Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

Publication Date	Closing Price*	Rating	Adjusted Price Target
31-Mar-2022	119.22	Equal Weight	115.00
12-Jan-2022	132.00		148.00
27-Oct-2021	122.93		135.00
27-Jan-2021	88.84		120.00
14-Dec-2020	94.78		115.00
27-Oct-2020	78.88	Overweight	100.00
19-Oct-2020	82.00		85.00
29-Jul-2020	76.09		75.00
20-Jul-2020	57.46		55.00

16-Jan-2020	49.77	50.00
18-Jul-2019	33.00	32.00

On 10-Jun-2019, prior to any intra-day change that may have been published, the rating for this security was Equal Weight, and the adjusted price target was 28.00.

Source: Bloomberg, Barclays Research

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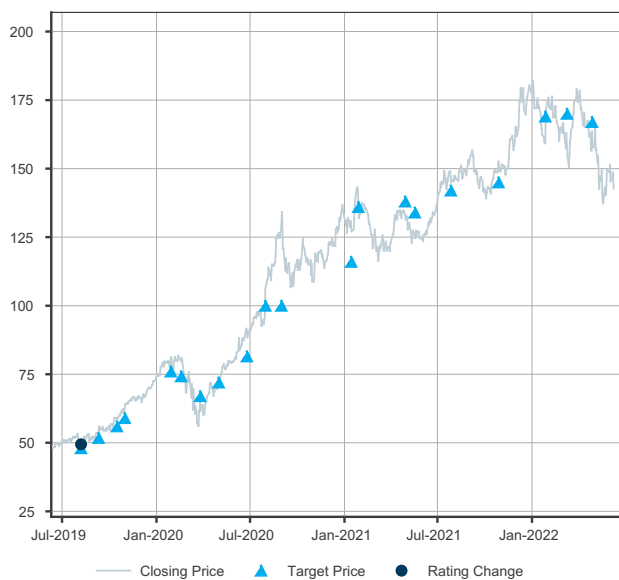
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Valuation Methodology: Our price target of \$115 is based upon 25x our CY23 EPS of \$4.62.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Risks to our thesis include continued PC growth at above historical rates, share gains in servers and PCs well above our expectations, better margins, and stronger than forecasted semi-custom results.

Apple, Inc. (AAPL / AAPL)Stock Rating: **EQUAL WEIGHT**Industry View: **NEUTRAL****USD 142.64** (09-Jun-2022)**Rating and Price Target Chart - USD (as of 09-Jun-2022)**

Currency=USD



Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

Publication Date	Closing Price*	Rating	Adjusted Price Target
28-Apr-2022	156.57		167.00
10-Mar-2022	162.95		170.00
27-Jan-2022	159.22		169.00
28-Oct-2021	152.57		145.00
27-Jul-2021	146.77		142.00
18-May-2021	124.85		134.00
29-Apr-2021	133.48		138.00
28-Jan-2021	137.09		136.00
14-Jan-2021	128.91		116.00
31-Aug-2020	129.04		100.00
31-Jul-2020	106.26		100.00
25-Jun-2020	91.21		81.50
01-May-2020	72.27		72.00
26-Mar-2020	64.61		67.00
18-Feb-2020	79.75		74.25
29-Jan-2020	81.09		76.00
31-Oct-2019	62.19		59.00
16-Oct-2019	58.59		56.00
10-Sep-2019	54.18		51.75
07-Aug-2019	49.76	Equal Weight	48.00

Source: Bloomberg, Barclays Research

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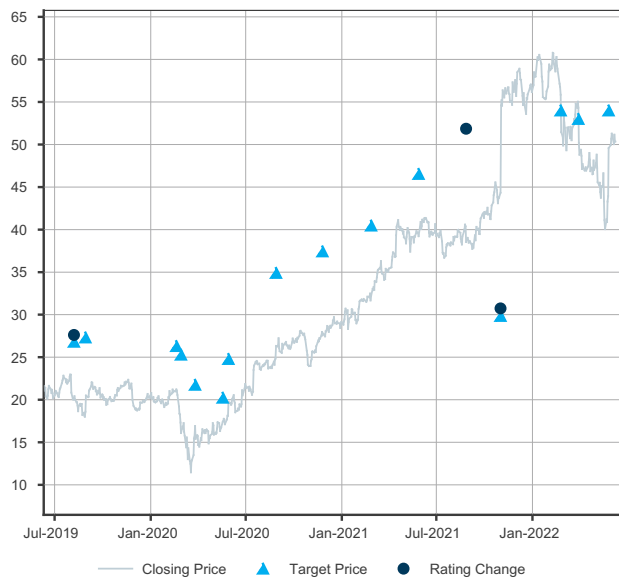
Valuation Methodology: We rate AAPL Equal Weight with a price target of \$167. While many are excited about Services and Wearables, we remain cautious on high Street expectations for the 5G iPhone cycle. We believe EPS growth will come mostly from buybacks. Our \$167 PT is based on a 27x P/E multiple on our CY23e EPS estimate of \$6.18.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: 1) iPhone growth. Apple market share peaked several years ago, and the company has not had a hit phone in a few years. 5G iPhones could help AAPL regain share after Huawei sanctions, but the hefty valuation already prices in a very successful iPhone 5G cycle, leading to more downside than upside risks. 2) Installed base impact on Services. Services have been a great growth business, but if the installed base grows more slowly or starts to shrink the segment could be materially affected. 3) Valuation. AAPL is trading at all time high multiples despite little operating income growth, falling gross and operating margins, and share losses in the core business. 4) Regulation. We expect to see increasing regulatory scrutiny on AAPL's practices in its App Store. Increasing regulation could lead to a change in its business model, or lower cut from app developers.

Other Material Conflicts: One of the Research Analysts on the fundamental equity coverage team (and/or a member of his or her household) has a long position in Vanguard Information Technology Index Fund (NYSEARCA:VGT) which primary holding is in Apple Inc. (NASDAQ: AAPL).

Dell Technologies Inc. (DELL / DELL)Stock Rating: **EQUAL WEIGHT**Industry View: **NEUTRAL****USD 50.35** (09-Jun-2022)**Rating and Price Target Chart - USD (as of 09-Jun-2022)**

Currency=USD



Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

Publication Date	Closing Price*	Rating	Adjusted Price Target
27-May-2022	43.93		54.00
30-Mar-2022	54.32		53.00
24-Feb-2022	55.84		54.00
01-Nov-2021	56.41	Equal Weight	29.85
27-Aug-2021	49.04	Rating Suspended	
28-May-2021	49.90		46.54
26-Feb-2021	41.01		40.47
25-Nov-2020	35.08		37.43
28-Aug-2020	33.49		34.91
29-May-2020	25.11		24.79
18-May-2020	22.15		20.23
26-Mar-2020	21.52		21.75
28-Feb-2020	20.47		25.29
19-Feb-2020	26.98		26.31
29-Aug-2019	23.66		27.32
07-Aug-2019	25.49	Equal Weight	26.81

Source: Bloomberg, Barclays Research

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Valuation Methodology: Our price target of \$54 reflects 7x FY24 EPS estimate of \$7.66

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: 1) Cloud. For DELL's hardware business, the move to public cloud represents a risk as most of its sales go to on-premise deployments. 2) PC market decline. Dell has been able to largely offset a declining PC market (pre-Covid-19) by taking share, but this is getting tougher as smaller players don't have much share left to lose. 3) On-prem hardware spending pressure will likely increase in the long term post Covid-19, driven by acceleration of public cloud adoption.

HP Inc. (HPQ / HPQ)

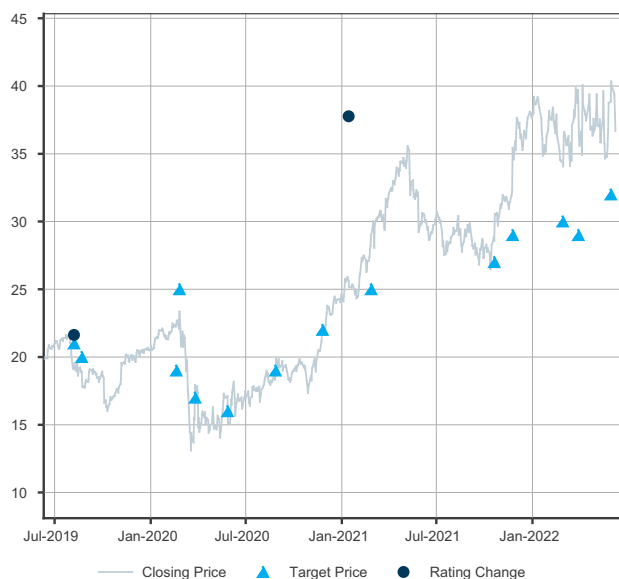
Stock Rating: **UNDERWEIGHT**

Industry View: **NEUTRAL**

USD 36.67 (09-Jun-2022)

Rating and Price Target Chart - USD (as of 09-Jun-2022)

Currency=USD



Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

Publication Date	Closing Price*	Rating	Adjusted Price Target
31-May-2022	38.84		32.00
30-Mar-2022	38.84		29.00
28-Feb-2022	34.36		30.00
24-Nov-2021	32.19		29.00

20-Oct-2021	28.86		27.00
26-Feb-2021	28.97		25.00
14-Jan-2021	25.62	Underweight	
25-Nov-2020	22.25		22.00
27-Aug-2020	18.70		19.00
27-May-2020	17.12		16.00
26-Mar-2020	17.94		17.00
25-Feb-2020	23.35		25.00
19-Feb-2020	22.43		19.00
22-Aug-2019	18.93		20.00
07-Aug-2019	19.09	Equal Weight	21.00

Source: Bloomberg, Barclays Research

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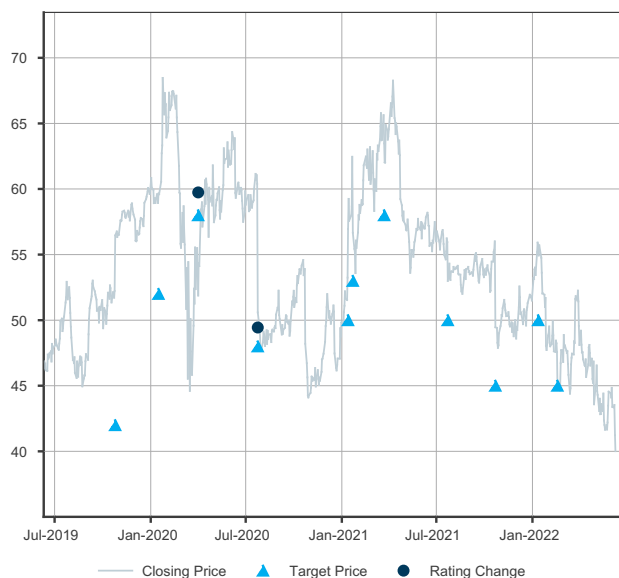
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Valuation Methodology: We rate HPQ shares at Underweight with a price target of \$32, based on the stock trading at a P/E multiple of 7.5x our FY23e EPS estimate of \$4.20, a discount to its five-year average. While we see some long-term drivers in 3D printing and the A3 market as well as Covid-19 driven PC strength in the near-term, we believe the company faces longer-term secular challenges in the PC and printing markets.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: We view a more pronounced investor rotation toward value or deep-value stocks as the primary upside risk to our rating and valuation. A more permanent work-from-home dynamic impacting the Printing and Commercial PC Market is the primary downside risk, in our view.

Intel Corp. (INTC / INTC)Stock Rating: **UNDERWEIGHT**Industry View: **NEUTRAL****USD 40.01** (09-Jun-2022)**Rating and Price Target Chart - USD (as of 09-Jun-2022)**

Currency=USD



Source: IDC, Barclays Research

[Link to Barclays Live for interactive charting](#)

Publication Date	Closing Price*	Rating	Adjusted Price Target
18-Feb-2022	47.57		45.00
12-Jan-2022	55.21		50.00
22-Oct-2021	56.00		45.00
23-Jul-2021	53.00		50.00
23-Mar-2021	63.48		58.00
22-Jan-2021	56.66		53.00
13-Jan-2021	56.95		50.00
24-Jul-2020	50.59	Underweight	48.00
01-Apr-2020	51.88	Equal Weight	58.00
16-Jan-2020	59.66		52.00
25-Oct-2019	56.46		42.00

On 10-Jun-2019, prior to any intra-day change that may have been published, the rating for this security was Underweight, and the adjusted price target was 40.00.

Source: Bloomberg, Barclays Research

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Valuation Methodology: Our price target of \$45 is based upon 13x our CY23 PF EPS of \$3.35.

Risks which May Impede the Achievement of the Barclays Research Valuation and Price Target: Risks to our thesis include continued PC growth at above historical rates, better share in PC and Server markets, technology transitions accelerating, and poor execution by AMD.

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