FOR PUBLICATION

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

E. OHMAN J:OR FONDER AB; STICHTING PENSIOENFONDS PGB, Lead Plaintiffs,

Plaintiffs-Appellants,

and

IRON WORKERS LOCAL 580 JOINT FUNDS,

Plaintiff,

v.

NVIDIA CORPORATION; JENSEN HUANG; COLETTE KRESS; JEFF FISHER,

Defendants-Appellees,

and

OAKLAND COUNTY EMPLOYEES' RETIREMENT SYSTEM; OAKLAND COUNTY VOLUNTARY EMPLOYEES'

No. 21-15604

D.C. No. 4:18-cv-07669-HSG

OPINION

BENEFIT ASSOCIATION TRUST; OAKLAND COUNTY EMPLOYEES' RETIREMENT SYSTEM TRUST,

Defendants.

Appeal from the United States District Court
for the Northern District of California
Haywood S. Gilliam, Jr., District Judge, Presiding

Argued and Submitted May 10, 2022
San Francisco, California

Filed August 25, 2023

Before: J. Clifford Wallace, William A. Fletcher, and Gabriel P. Sanchez, Circuit Judges.

Opinion by Judge W. Fletcher;
Dissent by Judge Sanchez

SUMMARY*

Securities Fraud

The panel affirmed in part and reversed in part the district court's dismissal of a securities fraud action brought

* This summary constitutes no part of the opinion of the court. It has been prepared by court staff for the convenience of the reader.

under §§ 10(b) and 20(a) of the Securities and Exchange Act of 1934 and Rule 10b-5 against NVIDIA Corp. and three of its officers.

Plaintiffs alleged that NVIDIA, a producer of graphics processing units, knowingly or recklessly made materially misleading and false statements regarding the impact of cryptocurrency sales on NVIDIA's financial performance in order to conceal the extent to which NVIDIA's revenue growth depended on the notoriously volatile demand for cryptocurrency. Plaintiffs alleged that the three individual defendants had actual knowledge that increases in demand for NVIDIA's Gaming-segment products were largely driven by crypto-related sales, that their public statements minimizing the impact of crypto-related sales on NVIDIA's revenues were materially false or misleading, and that the statements were made knowingly or recklessly. The district court dismissed plaintiffs' amended complaint for failure to sufficiently plead that defendants' allegedly false or misleading statements were made knowingly or recklessly.

In order to prevail on their claims under § 10(b) and Rule 10b-5, plaintiffs were required to show both that defendants' statements were materially false or misleading, and that their statements were made knowingly or recklessly. The panel held that the amended complaint sufficiently alleged that defendants Jensen Huang and Colette Kress made materially false or misleading statements, but the amended complaint did not sufficiently so allege as to defendant Jeff Fisher. The panel held that the amended complaint sufficiently alleged that Huang, but not Kress, made the statements knowingly or recklessly, in violation of § 10(b) and Rule 10b-5.

Section 20(a) assigns joint and several liability for any person who controls any person liable under

§ 10(b). Because the panel held that the amended complaint did not sufficiently plead a cause of action under § 10(b) and Rule 10b-5 against defendants Kress and Fisher, the only alleged primary violation was that committed by NVIDIA through defendant Huang. The panel affirmed the district court's dismissal of plaintiffs' § 20(a) claims against Kress and Fisher, vacated the dismissal of the § 20(a) claims as to Huang, and remanded for further proceedings as to those claims.

Dissenting, Judge Sanchez wrote that, under the pleading requirements of the Private Securities Litigation Reform Act of 1995, plaintiffs failed sufficiently to allege either falsity or scienter.

COUNSEL

Gregory P.N. Joseph (argued) and Rachel M. Cherington, Joseph Hage Aaronson LLC, New York, New York; Eric Gerard, Matthew L. Mustokoff, and Andrew L. Zivitz, Kessler Topaz Meltzer & Check LLP, Radnor, Pennsylvania; Jennifer L. Joost, Kessler Topaz Meltzer & Check LLP, San Francisco, California; John Browne and Michael Mathai, Bernstein Litowitz Berger & Grossman LLP, New York, New York; Lauren M. Cruz and Jonathan D. Uslaner, Bernstein Litowitz Berger & Grossman LLP, Los Angeles, California; for Plaintiffs-Appellants.

Patrick E. Gibbs (argued), John Dwyer, Samantha Kirby, Joshua Walden, and Claire A. McCormack, Cooley LLP, Palo Alto, California; Kathleen R. Hartnett, Julie M. Veroff, Cooley LLP, San Francisco, California; Sarah M. Lightdale and Patrick Hayden, Cooley LLP, New York, New York; for Defendants-Appellees.

OPINION

W. FLETCHER, Circuit Judge:

Lead Plaintiff E. Öhman J:or Fonder AB and others ("Plaintiffs") brought this putative class action on behalf of all persons or entities who purchased or otherwise acquired common stock of NVIDIA Corporation ("NVIDIA") during the proposed Class Period. Plaintiffs allege that during the Class Period defendant NVIDIA and three of its officers knowingly or recklessly made materially "misleading and false statements regarding the impact of cryptocurrency sales on NVIDIA's financial performance" in order to conceal the extent to which NVIDIA's revenue growth depended on the notoriously volatile demand for cryptocurrency ("crypto"). Individual defendants are Jensen Huang, NVIDIA's co-founder, President, and Chief Executive Officer; Colette Kress, NVIDIA's Executive Vice President and Chief Financial Officer; and Jeff Fisher, NVIDIA's Senior Vice President of the GeForce Business Unit and Head of Gaming during the Class Period.

Plaintiffs allege violations of Sections 10(b) and 20(a) of the Securities and Exchange Act of 1934 ("Exchange Act"), 15 U.S.C. §§ 78j(b) and 78t(a), and of Securities and Exchange Commission Rule 10b-5, 17 C.F.R. § 240.10b-5. Plaintiffs allege that the individual defendants had actual knowledge that increases in demand for NVIDIA's Gaming-segment products were largely driven by crypto-related sales, that their public statements minimizing the impact of crypto-related sales on NVIDIA's revenues were materially false or misleading, and that the statements were made knowingly or recklessly.

The district court dismissed Plaintiffs' first complaint with leave to amend, holding that it failed to plead sufficiently that defendants' statements were materially false or misleading, and that the statements were made knowingly or recklessly. The complaint's allegations that the statements were materially false or misleading relied in part on expert analysis provided by the Prysm Group ("Prysm"), which had been employed by Plaintiffs to provide an analysis of NVIDIA's finances. The court found that Plaintiffs' complaint "fail[ed] to describe Prysm's assumptions and analysis with sufficient particularity to establish a probability that its conclusions are reliable." Further, the court found that the complaint's allegations of scienter depended on confidential witness statements that "fail[ed] to plausibly establish that any particular statement by any Individual Defendant was knowingly or recklessly false or misleading when made."

After Plaintiffs amended their complaint, the district court dismissed the complaint under Rule 12(b)(6) without leave to amend. *Iron Workers Local 580 Joint Funds v. NVIDIA Corp.*, 522 F. Supp. 3d 660, 679 (N.D. Cal. 2021). The court dismissed on the sole ground that the amended complaint failed to sufficiently plead that the defendants' allegedly false or misleading statements were made knowingly or recklessly. *Id.* The court found that allegations in the complaint "again fail[ed] to raise a strong inference of scienter, largely because Plaintiffs [did] not adequately tie the specific contents of any . . . data sources [about crypto-related demand] to particular statements so as to plausibly show that the Defendant who made each specified statement knowingly or recklessly spoke falsely." *Id.* at 674. The court did not reach the question whether the amended complaint failed to sufficiently plead that the

statements were materially false or misleading. *Id.* at 679 n.6.

We reverse in part and remand for further proceedings.

I. Background

The following narrative is taken from Plaintiffs' amended complaint. Throughout this opinion unless otherwise noted, text inside quotation marks is taken directly from the amended complaint.

NVIDIA is one of the world's largest producers of graphics processing units ("GPUs"). A GPU is processing hardware that, when incorporated into an electronic device, allows that device to "perform[] computationally intensive tasks more efficiently." GPUs were developed primarily for graphics rendering and are "used most frequently in video gaming," but GPUs can also perform other "non-graphics tasks requiring repetitive computations." One such non-graphics task is crypto mining.

Cryptocurrencies are digital "tokens" that are circulated on networks using blockchain technology. At the heart of the technology is the blockchain, a "decentralized, immutable ledger" that relies on participants in the network to cooperatively verify and record pending transactions. Participants do so by using their computers' processing power to solve "a difficult mathematical puzzle through laborious trial-and-error work," and solutions are rewarded with new issues of cryptocurrency. This puzzle-solving process is called "mining."

In recent years, crypto networks have grown in size and complexity, making crypto mining an increasingly computational-intensive task. As a result, crypto miners use powerful mining hardware, such as GPUs, to perform their

mining. Crypto miners' demand for GPUs can substantially boost the revenues of companies selling GPUs to miners. "Because cryptocurrency prices have swung wildly over their short history, the profitability of mining has followed suit," and the resulting demand for GPUs "has proven extremely volatile." When crypto prices drop substantially, mining becomes unprofitable. When that happens, miners stop purchasing GPUs and, in some cases, start reselling GPUs on the secondary market.

Before the beginning of the Class Period, analysts and investors witnessed firsthand the impact of the "downside of crypto-mania" on NVIDIA's "chief rival," Advanced Micro Devices ("AMD"). In 2013 and 2014, AMD's GPUs were "the gold standard" in hardware for mining Bitcoin, one of the most popular early cryptocurrencies. In the second half of 2013, Bitcoin prices increased dramatically. As a result, the demand for AMD's GPUs "skyrocketed," with its GPUs selling for up to three times their usual price. Five months after the peak demand for Bitcoin, "the price of Bitcoin dropped more than 70% . . . [, and] so, too, did demand for AMD's GPUs—a problem compounded by miners dumping used AMD GPUs on the secondary market at steep discounts." "AMD's revenues suffered as its crypto-related sales evaporated."

The proposed Class Period runs from May 10, 2017, through November 14, 2018. The gravamen of Plaintiffs' suit is that, during the Class Period, the individual Defendants knowingly or recklessly misled investors about NVIDIA's exposure to the crypto volatility that AMD had experienced just a few years before. The amended complaint alleges that the individual Defendants knew that crypto miners were purchasing very large numbers of NVIDIA's "GeForce" GPUs, designed for gaming, but that in their

public statements the individual Defendants failed to reveal, or materially understated, the amount of NVIDIA's revenue growth that was due to crypto-related purchases of GeForce GPUs.

NVIDIA generally does not sell its GPUs directly to end users, but rather to device manufacturers, referred to as "partners." Partners purchase GPUs from NVIDIA and distribute them to end users. NVIDIA sells to partners in five markets, commonly referred to as "segments." Two segments are pertinent here: (1) Gaming; and (2) Original Equipment Manufacturer and Intellectual Property ("OEM"). The Gaming segment is NVIDIA's most important market. During the Class Period, revenues in the Gaming segment "exceeded those of the four other segments combined." NVIDIA's primary product in the Gaming segment is its "GeForce GPU," which is "designed to improve video-game applications." (Cleaned up.) GeForce GPUs are designed for gaming, but like AMD's GPUs they can also be used for crypto mining. In particular, GeForce GPUs can be used to mine "Ether," one of the most significant cryptocurrencies during the Class Period. The OEM segment generally comprises "low-end GPUs sold into devices such as tablets and phones, as well as intellectual-property assets." OEM has been an "ancillary catch-all segment that contributed just 5% to 10% of [NVIDIA's] revenues."

NVIDIA carefully monitors purchases of GPUs from its partners. Such purchases are known as "sellout." "In 2015, [Defendant] Huang told investors during an earnings call, 'we monitor sellout in the channel literally every day.'"

In 2016, "signs of a new bubble appeared." The price of Bitcoin more than quadrupled between September 2015 and

the end of 2016, and a number of other cryptocurrencies came on line at about this time. The most important of the new cryptocurrencies was Ether. "[I]n the spring of 2017, Ether began a meteoric climb that temporarily peaked at over $400 per token . . . . [I]n January 2018, Ether peaked at over $1,400 per token—an increase of more than 13,000% in a single year. Other cryptocurrencies mined with GPUs witnessed similarly dramatic increases in value. These skyrocketing valuations made mining enormously profitable, and once again caused a massive surge in demand for GPUs."

As cryptocurrency valuations skyrocketed, miners purchased NVIDIA's GeForce GPUs "in droves." NVIDIA's Gaming-segment revenues, driven by sales to crypto miners, increased dramatically as the price of Ether and other cryptocurrencies skyrocketed. "[O]n May 9, 2017, NVIDIA reported first quarter sales [from February 1 to April 30, 2017] for its Gaming segment of $1.02 billion—representing a 49% year-over-year increase and 52.8% of total revenues. The Company reported similarly spectacular numbers each quarter for the next year, including on May 10, 2018, when it announced that Gaming-segment revenues were $1.723 billion—a 68% year-over-year increase, and approximately 2.5 times the revenue for that segment two years prior."

"[I]n May 2017, [at the beginning of the class period,] NVIDIA launched a special GPU specifically designed for cryptocurrency mining (the 'Crypto SKU')." Crypto SKUs were designed for crypto mining rather than for gaming. Revenues from sales of Crypto SKUs were reported as OEM-segment rather than Gaming-segment revenues. Despite the introduction of Crypto SKUs, crypto miners continued to purchase enormous numbers of GeForce GPUs.

All revenues from sales of GeForce GPUs were recorded by NVIDIA as Gaming-segment revenues, even though a very substantial portion of those revenues came from purchases by crypto miners.

On January 1, 2018, NVIDIA revised its GeForce End User Licensing Agreement ("EULA") to generally prohibit end users from employing GeForce GPUs in corporate datacenters. Critically, however, the EULA left an "important carve-out [that] . . . not only acknowledged, but encouraged, the continued use of GeForce GPUs (not the Crypto SKU) for large-scale cryptocurrency mining in datacenters." The carve-out read, "The software is not licensed for datacenter deployment, except that blockchain processing in a datacenter is permitted."

During the Class Period, analysts and investors repeatedly asked the individual Defendants about the source of NVIDIA's dramatically increased company revenues. In particular, they asked whether the increased revenues were driven by sales to crypto miners. In the wake of AMD's crypto boom and bust, analysts and investors "were acutely focused on how much of NVIDIA's revenues were based on cryptocurrency-mining." "Analysts asked specific questions about the subject during each of the Company's earnings calls during the Class Period and . . . at numerous conferences and in several interviews."

When responding to questions from analysts and investors, individual Defendants Huang and Kress repeatedly denied that increases in NVIDIA's Gaming-segment revenue were driven by demand from crypto miners. As recounted in detail below, Defendants Huang and Kress insisted that NVIDIA's exposure to crypto volatility was limited to the relatively small fraction of

NVIDIA's total revenues attributable to OEM-segment sales of Crypto SKUs. As also recounted in detail below, investors and analysts credited Huang's and Kress's statements.

Near the end of the Class Period, the profitability of crypto mining declined. Purchases of GeForce GPUs declined as a result. On August 16, 2018, NVIDIA lowered revenue guidance by 2.2% for the upcoming quarter that would run from August 1 to October 31, 2018. This guidance projected revenue at a level "significantly lower than the market had expected." "Investors and the financial press immediately connected the share price decline to NVIDIA's guidance revision and soft results from its cryptocurrency sales." However, Defendants did not disclose the source and extent of the problem. Defendant Huang "downplayed concerns." "Analysts credited Defendants' reassuring statements."

On November 15, 2018, the day after the end of the Class Period, NVIDIA announced that it had missed revenue projections by nearly 2% for the quarter that had just ended and that "it was expecting [overall] revenues of only $2.7 billion" in the next quarter, "a 7% decline" from the quarter a year earlier. In prepared remarks on November 15, Defendant Kress stated: "Gaming was short of expectations as post crypto channel inventory took longer than expected to sell through." In his remarks on November 15, Defendant Huang referred to the excess channel inventory as a "crypto hangover."

As recounted in detail below, investors and analysts were surprised by NVIDIA's November 15 disclosures. NVIDIA's stock price plummeted. It dropped 28.5% in two

trading days, from $202.39 per share on November 15 to $144.70 per share on November 19.

This suit followed.

II. Standard of Review

"We take as true the complaint's plausible and properly pleaded allegations . . . ." *In re Quality Sys., Inc. Sec. Litig.*, 865 F.3d 1130, 1136 (9th Cir. 2017). Securities fraud cases, such as this one, are subject to the heightened pleading standard not only of Federal Rule of Civil Procedure 9(b) but also of the Private Securities Litigation Reform Act of 1995 ("PSLRA"). *Zucco Partners, LLC v. Digimarc Corp.*, 552 F.3d 981, 990–92 (9th Cir. 2009). Rule 9(b) provides, "In alleging fraud . . . , a party must state with particularity the circumstances constituting fraud . . . ." The PSLRA provides, as to allegations of "[m]isleading statements and omissions," that a complaint "shall specify each statement alleged to have been misleading [and] the reason or reasons why the statement is misleading." 15 U.S.C. § 78u–4(b)(1). It provides, as to allegations of a "[r]equired state of mind," that a "complaint shall, with respect to each act or omission alleged to violate this chapter, state with particularity facts giving rise to a strong inference that the defendant acted with the required state of mind." 15 U.S.C. § 78u–4(b)(2). "In determining whether the complaint has satisfied these standards, we 'consider the complaint in its entirety, as well as . . . documents incorporated into the complaint by reference, and matters of which a court may take judicial notice.'" *Quality Sys.*, 865 F.3d at 1140 (alteration in original) (quoting *Tellabs, Inc. v. Makor Issues & Rts., Ltd.*, 551 U.S. 308, 322–23 (2007)).

III. Discussion

In order to prevail, Plaintiffs must show both that Defendants' statements were materially false or misleading, and that their statements were made knowingly or recklessly. In dismissing Plaintiffs' amended complaint under Rule 12(b)(6), the district court reached only the question whether Defendants' statements were made knowingly or recklessly.

We may reach the question whether Defendants' statements were materially false or misleading despite the district court's failure to reach it. Because the district court dismissed the amended complaint under Rule 12(b)(6), there is no need for record development. *Nw. Env't Def. Ctr. v. Brown*, 640 F.3d 1063, 1080–81 (9th Cir. 2011), *rev'd on other grounds sub nom*, *Decker v. Nw. Env't Def. Ctr.*, 568 U.S. 597 (2013). For purposes of Rule 12(b)(6), we need only read the complaint and any associated documents and, where appropriate, take judicial notice. Both parties have briefed the question whether Defendants' statements were materially false or misleading. *See, e.g.*, *Dole Food Co. v. Watts*, 303 F.3d 1104, 1117–18 (9th Cir. 2002) (reversing the district court after deciding a question not reached by the district court: "The district court did not reach this issue, but both parties agreed at oral argument that it is properly before us for decision. Because the record is sufficiently developed and the issue has been presented and argued to us, we agree that it is appropriate for us to decide the question."); *see also Harris Rutsky & Co. Ins. Servs., Inc. v. Bell & Clements, Ltd.*, 328 F.3d 1122, 1136 (9th Cir. 2003). We therefore reach the question whether Defendants' statements were materially false or misleading, as well as the question whether Defendants' statements were made knowingly or recklessly.

We first address Plaintiffs' claim under Section 10(b) of the Exchange Act and SEC Rule 10b-5. We hold that the amended complaint sufficiently alleges that Defendant Huang made materially false or misleading statements and that he made those statements knowingly or recklessly, in violation of Section 10(b) and of Rule 10b-5. We next address Plaintiffs' claim under Section 20(a) of the Exchange Act. We remand that claim for further proceedings in the district court.

A. Section 10(b) of the Exchange Act and SEC Rule 10b-5

Section 10(b) of the Exchange Act, 15 U.S.C. § 78j(b), provides in relevant part: "It shall be unlawful for any person, directly or indirectly . . . [t]o use or employ, in connection with the purchase or sale of any security registered on a national securities exchange . . . any manipulative or deceptive device or contrivance in contravention of such rules and regulations as the Commission may prescribe as necessary or appropriate in the public interest or for the protection of investors." 15 U.S.C. § 78j(b). SEC Rule 10b-5 provides in relevant part: "It shall be unlawful for any person, directly or indirectly . . . [t]o make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or [t]o engage in any act, practice, or course of business which operates or would operate as a fraud or deceit upon any person." 17 C.F.R. § 240.10b-5. The amended complaint alleges that Defendants made materially false or misleading statements, and that they did so knowingly or recklessly.

1. Materially False or Misleading Statements

A materially false or misleading statement violates Section 10(b) and Rule 10b-5. "Falsity is alleged when a plaintiff points to defendant's statements that directly contradict what the defendant knew at the time." *Khoja v. Orexigen Therapeutics, Inc.*, 899 F.3d 988, 1008 (9th Cir. 2018). "Even if a statement is not false, it may be misleading if it omits material information." *Id.* at 1008–09. "[A] statement is misleading if it would give a reasonable investor the 'impression of a state of affairs that differs in a material way from the one that actually exists.'" *Retail Wholesale & Dep't Store Union Loc. 338 Ret. Fund v. Hewlett-Packard Co.*, 845 F.3d 1268, 1275 (9th Cir. 2017) (alteration in original) (quoting *Berson v. Applied Signal Tech., Inc.*, 527 F.3d 982, 985 (9th Cir. 2008)).

The amended complaint alleges that the individual Defendants' statements during the Class Period were materially false or misleading because they failed to state or substantially understated the extent to which NVIDIA's Gaming-segment revenues were based on sales of GeForce units to crypto miners. We hold that the statements made by individual Defendants Huang and Kress were materially false or misleading. However, we do not so hold as to a statement made by Defendant Fisher.

a. A Very Substantial Part of NVIDIA's Revenues Came from Sales of GeForce GPUs to Crypto Miners

The amended complaint sufficiently alleges that a substantial part of NVIDIA's crypto-related revenue during the proposed Class Period came from sales of GeForce GPUs that were reported in NVIDIA's Gaming segment. We remind the reader that the proposed Class Period runs from May 10, 2017, to November 14, 2018.

The amended complaint alleges that in January 2019, after the precipitous fall of NVIDIA's stock price in the wake of revelations during its November 15, 2018, earnings call, RBC Capital Markets ("RBC") published an investigative report. RBC, a subsidiary of the Royal Bank of Canada, is an international investment bank with offices throughout the world. RBC has no connection to Plaintiffs. RBC's report assessed "the true effect of cryptocurrency-related sales . . . on NVIDIA's revenue [during an eighteen-month period] from February 2017 to July 2018." "The report concluded that NVIDIA had 'generated $1.95B in total revenue related to crypto/blockchain.' The report pointedly noted that '[t]his compares to [the] company's statement that it generated [about] $602M over the same time period' in the OEM segment. In other words, RBC's analysis indicated that NVIDIA had understated its cryptocurrency-related revenue by $1.35 billion over an 18-month period that overlapped with the Class Period." (First and second alterations in original.)

The amended complaint further alleges that Plaintiffs employed the Prysm Group ("Prysm"), "an economic consulting firm . . . that specializes in distributed ledger and blockchain technology," to investigate the question already investigated by RBC. Prysm's conclusion is almost identical to RBC's conclusion. Prysm calculated that, for the fifteen months comprising five fiscal-year quarters between May 1, 2017, and July 31, 2018, "Defendants understated NVIDIA's crypto-related GPU sales by $1.126 billion."

The amended complaint includes a table summarizing Prysm's conclusions. The table compares NVIDIA's total cryptocurrency-related revenues to its Crypto SKU revenues for five of the fiscal-year quarters in the Class Period:

FY 2018			FY 2019		
2Q18	3Q18	4Q18	1Q19	2Q19	Total
NVIDIA's Reported Revenues for Crypto SKU					
$150m	$70m	$75m	$289m	$18m	$602m
Actual Cryptocurrency-Related Revenues					
$349m	$299m	$541m	$364m	$175m	$1,728m
Difference Between Reported Revenues for Crypto SKU and Actual Cryptocurrency-Related Revenues					
$199m	$229m	$466m	$75m	$157m	$1,126m

During the five fiscal-year quarters running from May 1, 2017, through July 31, 2018,[1] NVIDIA reported revenues from sales of GeForce GPUs in its Gaming segment rather than in its OEM segment. According to the table, during that fifteen-month period, reported crypto-related revenues in the OEM segment totaled $602 million, while overall crypto-related revenues totaled $1.728 billion. Thus, crypto-related revenues in the Gaming segment were $1.126 billion.

In the discussion that follows, we rely on the estimated numbers Prysm provided in the table reproduced above. We recognize that, although the revenues listed on the table are expressed in precise numbers, they are estimates. Therefore, when relying on those estimates, we often use the word

[1] NVIDIA's fiscal-year quarters are dramatically different from the calendar-year quarters they represent. NVIDIA's fiscal year 2018 began on February 1, 2017. Thus, the second quarter of fiscal year 2018 ("2Q18") ran from May 1 through July 31, 2017. The second quarter of fiscal year 2019 ("2Q19") ran from May 1 through July 31, 2018.

"about" to remind the reader that the numbers in the Prysm table are estimates.

Defendants object that the Prysm analysis is not sufficiently reliable, even when combined with other allegations in the complaint, to support an allegation that Defendants' statements are false or misleading. We disagree.

First, the Prysm analysis was prepared by knowledgeable and competent professionals. Prysm is "an economic consulting firm based in New York and Los Angeles that specializes in distributed ledger and blockchain technology." Prysm is led by Drs. Cathy Barrera and Stephanie Hurder, both of whom have PhDs in business economics from Harvard University. Drs. Barrera and Hurder have held academic, consulting, and business positions in which they have specialized in the economics of blockchain.

Second, Prysm provided a detailed analysis to support its conclusions. *See* 15 U.S.C. § 78u-4(b)(1)(B). The complaint provided detailed information about Prysm's methodology as well as a particularized recitation of facts upon which Prysm relied. Prysm first calculated the additional computing power used on major GPU-mined blockchain networks during the Class Period. It focused on the "three most popular GPU-mined cryptocurrencies during the Class Period." The additional computing power was calculated using the change in the network's hashrate from one quarter to the next. Hashrate is the measure of the number of calculations performed per second on a given blockchain network. The hashrate data was obtained from "two of the most widely used sources of network hashrate data." The maximum hashrate of one quarter was compared

to the maximum hashrate of the next quarter. This produced a conservative estimate of the increased hashrate because, by using the maximum hashrate from the last quarter, Prysm assumed that every single GPU that mined on the blockchain network last quarter at its peak was used during the subsequent quarter.

Prysm calculated the total number of GPUs needed to account for the additional computing power. Prysm used the hashing power of the GeForce GTX 1060 to represent a standard GPU's hashing power, as it was NVIDIA's cheapest and most economical model (and thus provided the most conservative revenue estimate). Based on the GeForce GTX 1060's hashing power, Prysm estimated that a minimum of approximately 16.9 million GPU units would be required to make up for the difference in computing power during the Class Period.

Prysm determined that NVIDIA's cryptocurrency market share was approximately 69%. It used three sources to make this determination. First, in 2018, Jon Peddie Research, a "prominent" computer industry research firm that is relied upon "by major investment firms throughout the financial industry to analyze market dynamics"—a research firm relied upon by Defendants themselves—published a study analyzing cryptocurrency mining market shares. The study estimated that NVIDIA's market share was approximately 69.4% in third-quarter fiscal year 2017 (August 1 through October 31, 2016) and 68.6% in fourth-quarter fiscal year 2017 (November 1, 2016, through January 31, 2017). Second, RBC estimated NVIDIA's market share during the entire class period to be 75%, substantially higher than the Jon Peddie Research estimate. Finally, Prysm relied on an internal NVIDIA study of market share in China. The study estimated that NVIDIA's cryptocurrency mining

market share in China was over 70% during five months beginning one month before the start of the Class Period, from April 1 through July 31, 2017. Prysm chose the most conservative of the three estimates. Using the conservative estimate of Jon Peddie Research, Prysm estimated that NVIDIA had a 69% share of the cryptocurrency-related GPU market during the Class Period. Prysm used that market share to calculate the number of NVIDIA GPU units used to produce the additional computing power on the blockchain networks.

To calculate the revenue earned by NVIDIA from the sale of its GPU units used for crypto mining, Prysm used the manufacturer's suggested retail price ("MSRP") for GeForce GTX 1060, NVIDIA's cheapest model. Prysm deducted 33% from this MSRP to account for retail markup—well above the industry norm of under 10%. It multiplied this number by the estimated number of NVIDIA GeForce GPU units sold during a fifteen-month (five quarter) period during the Class Period, from May 1, 2017 to July 31, 2018, resulting in an estimated $1.728 billion in cryptocurrency-related revenues for NVIDIA during that fifteen-month period. NVIDIA reported only $602 million in Crypto SKU revenue during that period. According to Prysm's calculations, NVIDIA thus earned a conservative estimate of $1.126 billion in crypto-related revenue during that period that was not reflected in its Crypto SKU sales reported in the OEM segment.

Third, Prysm's results are strikingly similar to the results obtained by RBC in its independent investigation. RBC estimated that over an eighteen-month (six quarter) period beginning one quarter before the start of the Class Period, from February 2017 to July 2018, NVIDIA understated its crypto-related revenues by $1.35 billion. Prysm estimated

that over a fifteen-month period from May 1, 2017, to July 31, 2018, NVIDIA understated its crypto-related revenues by $1.126 billion. If RBC's 18-month period had been reduced to a fifteen-month period, and if its estimate of understated cryptocurrency-related revenue had been reduced proportionately, its estimate for those fifteen months would have been an understatement of NVIDIA's crypto-related revenues by $1.125 billion.

Fourth, several former employees ("FEs") of NVIDIA confirmed, consistent with Prysm's analysis, that crypto miners purchased enormous quantities of GeForce GPUs, and that revenues from purchases of GeForce GPUs were counted as Gaming-segment rather than OEM-segment revenues. FE 1 was employed for over ten years as a Senior Account Manager in China. He left NVIDIA in December 2017, well into the class period. "FE 1 recounted that, beginning in 2016 and continuing through 2017, mining enterprises placed huge orders for GeForce GPUs from NVIDIA's partners, often in quantities of 50,000 or 100,000 units per order. Such bulk purchases are not made by gamers, who buy only single GeForce GPUs at a time for gaming." FE 2 was a Senior Products Director in Santa Clara, California, who worked at NVIDIA "from several years before the Class Period began to May 2017." FE 2 "stated that GeForce Gaming GPUs were the clear favorite among crypto-miners." FE 2 reported that "about two times per month, miner groups would come directly to NVIDIA's headquarters [in Santa Clara] looking to purchase cheap Gaming graphics cards in bulk amounts for crypto-mining. . . . NVIDIA then referred the miners to a third-party distributor." FE 4 "worked as a Community Manager in Moscow, Russia, from 2015 through August 2018." "FE 4 observed a huge percentage of Gaming GPUs being sold

to cryptocurrency miners, and not gamers, in late 2017. For example, one Moscow retailer sold 2,000 NVIDIA GPU units to a single customer during this period, all for cryptocurrency mining. FE 4 estimated that, by the first half of 2018, 50% of all NVIDIA Gaming GPUs being sold in Russia were to miners."

Fifth, the essential correctness of Prysm's analysis is confirmed by events in the market. When crypto mining became too expensive, crypto miners quit purchasing GeForce GPUs. Some miners even sold their GeForce GPUs. When the crypto mining market for GeForce GPUs collapsed, NVIDIA was forced to reduce its overall year-over-year revenue estimate by 7%.

In sum, we hold that the combination of the following is sufficient to show, even under the demanding pleading standard of the PSLRA, there is a sufficient likelihood that a very substantial part of NVIDIA's revenues during the Class Period came from sales of GeForce GPUs for crypto mining: (1) the very similar analyses of RBC and Prysm; (2) the statements of FE 1, FE 2, and FE 4; and (3) the fact that NVIDIA's earnings collapsed when cryptocurrency prices collapsed and crypto miners quit purchasing NVIDIA's GeForce GPUs.

b. Statements by Defendants Huang, Kress and Fisher

The amended complaint sufficiently alleges that Defendants Huang and Kress made materially false or misleading statements when they told analysts and investors that all or almost all of NVIDIA's crypto-related revenues were reported in its OEM segment rather than in its Gaming segment.

i. Statements by Defendant Huang

On August 10, 2017, Huang and Kress hosted an earnings call for NVIDIA's second-quarter fiscal year 2018 (May 1 through July 31, 2017). A Goldman Sachs analyst asked about the effect of cryptocurrency on NVIDIA's increased earnings. "Huang responded that the Company's Crypto SKU accounted for just $150 million of second-quarter revenues, and that 'we serve the vast . . . majority of the cryptocurrency demand out of that specialized product.'" (Alteration in original.) Huang failed to say that during that same quarter NVIDIA had received a total of about $349 million in crypto-related revenues, of which about $199 million was due to sales of GeForce GPUs. That additional $199 million in crypto-related revenues, not mentioned by Huang, had been reported as Gaming revenues.

On August 12, 2017, the website *VentureBeat* published a transcript of an interview with Huang shortly after the August 10 earnings call. The interviewer asked, "Did you say a hallelujah for cryptocurrency?" Huang answered that cryptocurrency mining "represented . . . maybe $150 million or so" and that "our core business is elsewhere." As noted above, NVIDIA's OEM segment had reported crypto-related revenues of $150 million during the quarter in question. Huang again failed to say that during that quarter NVIDIA had received about $349 million in total crypto-related revenues, of which about $199 million came from sales of GeForce GPUs that had been reported as Gaming revenues.

On August 23, 2017, NVIDIA filed a Form 10-Q with the SEC, reporting its second-quarter fiscal year 2018 results. Defendants Huang and Kress both signed the form. On the form, NVIDIA "announced a 59% increase of $701 million in GPU business revenue year-over-year, . . .

represent[ing] that the increase 'was due primarily to increased revenue from sales of GeForce GPU products *for gaming*.'" (Emphasis in original.) NVIDIA failed to say on the form that about half of its Gaming-segment revenues during the quarter came from sales of GeForce GPUs to crypto miners rather than to gamers.

On November 9, 2017, Defendants Huang and Kress hosted an earnings call for NVIDIA's third-quarter fiscal year 2018 (August 1 through October 31, 2017). On November 10, *VentureBeat* published the transcript of an interview with Huang. "*VentureBeat* questioned whether 'cryptocurrency is driving all of your success.' Defendant Huang responded by stating that, for NVIDIA, cryptocurrency was 'small but not zero . . . . It's large for somebody else. But it is small for us.' Huang also stated that cryptocurrency-related revenue was '[m]aybe $70 million'—the amount NVIDIA had attributed to the Crypto SKU the day before." (Alterations in original.) Huang failed to say that during the quarter in question about $229 million of NVIDIA's Gaming-segment revenues came from sales of its GeForce GPUs to crypto miners.

On November 21, 2017, NVIDIA filed a Form 10-Q with the SEC, reporting its third-quarter fiscal year 2018 results. Huang and Kress both signed the form. On the form, NVIDIA "stated that the 31% increase of $520 million in GPU business revenue year-over-year 'was due primarily to increased revenue from sales of GeForce GPU products *for gaming.*'" (Emphasis in original.) "It was materially false and misleading . . . to [so] state . . . when $648 million of NVIDIA's GPU revenues in the second quarter and third quarter of fiscal 2018—representing well over 100% of the Company's entire $520 million year-over-year increase in GPU revenues—was due to sales of GPUs for

cryptocurrency mining, *not* gaming." (Emphasis in original.)

On February 9, 2018, *Barron's* published an article describing an interview with Defendant Huang following NVIDIA's February 8 earnings call for the fourth-quarter of fiscal year 2018 (November 1, 2017, to January 31, 2018). The reporter "explained that '[w]hen I asked Huang if he wanted to point out anything in particular about the report and outlook, Huang began, "Clearly there's been a lot of talk about crypto."' Huang then stated that cryptocurrency represented a 'small, overall' 'part of our business this past quarter.'" (Alteration in original.) "[I]n fact, cryptocurrency-related revenues in fourth quarter fiscal 2018 comprised $541 million—nearly 20% of NVIDIA's entire fourth quarter fiscal 2018 revenues across all business segments."

On March 26, 2018, an industry publication, *TechCrunch*, published an interview with Defendant Huang. Huang stated in the interview "that 'he still attribute[d] crypto's demands as a small percentage of Nvidia's overall business.'" "[I]n fact, cryptocurrency-related revenues in fourth-quarter fiscal 2018 totaled $541 million—i.e., nearly 20% of NVIDIA's entire fourth-quarter fiscal 2018 revenues." Of that $541 million in fourth quarter cryptocurrency-related revenues, $466 million was for sales of GeForce GPUs falsely attributed to gaming.

On March 29, 2018, Defendant Huang appeared on Jim Cramer's CNBC show *Mad Money*. Cramer asked Huang about a report stating that "cryptocurrency risks are growing" and about another report stating that "we must be concerned about the stock of NVIDIA." Huang responded "that the 'core growth drivers' for the Company's revenue

results were other areas of the business—Gaming, Professional Visualization, Datacenter, and Automotive—and that 'cryptocurrency just gave it that extra bit of juice.'" When Cramer asked Defendant Huang to confirm that 'if people think [cryptocurrency] is that important, they're going to miss the bigger picture,' Huang responded, 'Absolutely,' and again contrasted NVIDIA's cryptocurrency-related business to the Company's 'core' businesses including Gaming."

ii. Statements by Defendant Kress

On August 23, 2017, NVIDIA filed the Form 10-Q with the SEC described above. Defendant Kress signed the form, along with Defendant Huang.

On September 6, 2017, Defendant Kress "spoke on behalf of NVIDIA at the Citi Global Technology Conference." A Citigroup analyst "asked Kress: '[W]hat steps has NVIDIA taken to avoid cannibalization of core gaming market from these cards?' In response, Kress stated, 'we covered most of cryptocurrency with our cryptocards [Crypto SKUs] that we had developed.'" Kress failed to say that in the fiscal quarter that had ended a week before, revenues from Crypto SKUs had been about $150 million, while revenues from GeForce GPUs sold to crypto miners had been about $199 million. That is, Kress failed to say that "in second quarter fiscal 2018, 57% of NVIDIA's cryptocurrency revenues (or $199 million) were realized through the Gaming segment, not through the Crypto SKU."

On November 9, 2017, Defendants Huang and Kress hosted the earnings call described above. A Citigroup analyst "asked Huang and Kress to 'quantify how much crypto was in the October quarter [running from August 1 through October 31, 2017].' . . . In response, Kress stated

that NVIDIA's 'specific crypto [cards] equated to about $70 million of revenue, which is [] comparable to the $150 million that we saw last quarter.'" Kress failed to say that in the "October quarter" at issue, revenues from GeForce GPUs sold to crypto miners had been about $229 million. She also failed (again) to say that while crypto-related revenues in the OEM segment had been $150 million during the previous quarter, revenues from sales of GeForce GPUs to crypto miners, recorded in the Gaming segment, during the previous quarter had been about $199 million. Put another way, Kress told the Citigroup analyst that crypto-related revenues for the two quarters had been about $220 million, attributable to sales of Crypto SKUs. She failed to say that during that same two-quarter period, NVIDIA had received about $428 million in revenues from sales of GeForce GPUs to crypto miners, which had been reported as Gaming-segment revenues.

On November 21, 2017, NVIDIA filed the Form 10-Q with the SEC described above. Defendant Kress signed the form, along with Defendant Huang.

On November 29, 2017, Defendant Kress represented NVIDIA at the Credit Suisse Technology, Media and Telecom Conference. When a Credit Suisse analyst "asked about the impact of cryptocurrency-related demand on NVIDIA's gaming revenues, Kress stated that 'there probably is some residual amount or small amount' but that 'the majority does reside in terms of our overall crypto card [Crypto SKU], which is the size of about $150 million in Q2.'" Kress failed to say that during that quarter sales of GeForce GPUs to crypto miners, reported in the Gaming segment, far exceeded sales of Crypto SKUs. Far from a "small amount," "in fact, Gaming-segment revenues from

sales to crypto-miners (and not gamers) were $199 million for the quarter."

iii. Statement by Defendant Fisher

On May 10, 2017, Defendants Huang, Kress and Fisher "participated in NVIDIA's Annual Investor Day." "During the presentation, Defendant Fisher identified the purported 'fundamental' drivers for Gaming revenues as 'eSports, competitive gaming, AAA gaming, [and] notebook gaming.'" "[D]uring second-quarter fiscal 2018 [running from May 1 through July 31, 2017], when Defendant Fisher made this statement, $199 million or (17%) of NVIDIA's Gaming-segment revenues were actually derived from cryptocurrency mining (not gaming)."

c. Response of Investors and Analysts

Based on statements by Defendants Huang and Kress, investors and analysts believed during the Class Period that NVIDIA was not vulnerable to the vicissitudes of crypto mining. "For example, an August 10, 2017 report from Oppenheimer [Holdings] noted that '[c]rypto mining was [about] $150M in 2Q'—a figure that matched NVIDIA's reported Crypto SKU sales in the OEM segment that quarter—and mentioned no additional crypto-related revenues in Gaming." "Likewise, in a report issued May 11, 2018, SunTrust Robinson Humphrey explained that 'crypto revenue showing up in the crypto SKU significantly mitigates what we see as the biggest near-term risk in [NVIDIA], which is that older gaming GPUs sold to crypto-miners could flood the secondary market and sink gaming revenue."

Analysts and investors were surprised when, during the earnings call on November 15, 2018, NVIDIA disclosed the

degree to which its revenues during the Class Period had depended on sales to crypto miners. During the question-and-answer period of the call, an analyst from Sanford C. Bernstein & Co. asked:

> [T]he last several quarters, you've been saying . . . that you guys felt like you had a really good handle on the channel, and yet it seems like maybe that wasn't exactly the case. . . . Like what happened?

On November 16, the day after the disclosure, "analysts from BMO [Bank of Montreal] questioned Defendants' credibility: '[t]he large shortfall in guidance due to a bloated channel due to crypto-currency is in sharp contrast to the comments around channel inventory from the company at the last earnings call.'" "Analysts at Deutsche Bank reported the same day, 'Gaming does not appear to be as compelling an example of growth as many previously believed' . . . ." "Deutsche Bank concluded, 'we expect the inventory adjustment to reset Gaming segment expectations to a meaningfully lower level and call into question what the true growth rate of Gaming was/is.'"

Also on November 16, "Morgan Stanley . . . questioned the veracity of Defendants' prior assurances." It wrote, "The implications of [Defendants'] commentary is that a larger portion of demand in late 2017/early 2018 was for crypto than they had initially indicated, and that an end to the crypto bubble caused a channel refill which overshot. . . . There is also the question of where end demand actually has been, ex-crypto."

On November 17, *VentureBeat* published an interview with Defendant Huang. "The interviewer explained: 'I . . .

thought [cryptocurrency] was never really more than a tenth of your revenue. It does surprise me that it can come back and have this bigger effect.' . . . 'How do we get to larger numbers that actually affect the quarterly results, though? Again, it seemed, in the past, that it was described as a small part of revenue.'"

Investors' and analysts' surprise was reflected in the precipitous fall in NVIDIA's stock price immediately after the disclosure on November 15. As noted above, NVIDIA's stock price dropped 28.5% in two trading days, from $202.39 per share on November 15 to $144.70 per share on November 19.

When RBC released its investigative report in January 2019, industry press published articles saying that analysts and investors had been misled. *Bitcoin Exchange Guide* headlined, "RBC Capital Markets Analyst Investigates NVIDIA Earnings, Discovers Over $1 Billion More Than Stated." *Yahoo! Finance* headlined, "Analyst Finds Nvidia Earned $1.35 Billion More in Total Crypto Revenue Than Stated." *TechPost* headlined, "Analyst says Nvidia lied about its cryptocurrency earnings to avoid stock crash."

d. Materially False or Misleading Statements

We conclude from the foregoing that the complaint sufficiently alleged Defendants Huang and Kress made materially false or misleading statements during the Class Period, leading investors and analysts to believe that NVIDIA's crypto-related revenues were much smaller than they actually were. Huang and Kress repeatedly stated that NVIDIA's crypto-related revenues were either entirely or largely revenues from sales of Crypto SKUs, reported in the OEM segment. They repeatedly failed to mention in their statements during the Class Period that the great majority of

NVIDIA's crypto-related revenues came from sales of GeForce GPUs, reported in the Gaming segment.

The response of investors and analysts after NVIDIA's disclosures on November 15 make clear that Huang's and Kress's statements during the Class Period were materially false and misleading. As recounted above, sophisticated professional analysts were surprised by the November 15 disclosures. Immediately after the disclosures, investors sold great quantities of NVIDIA stock, resulting in a sudden and substantial fall in NVIDIA's stock price.

We conclude, however, that Defendant Fisher's statement on May 10, 1017, was not materially false or misleading. Fisher's statement could reasonably have been understood as a general statement about the source of NVIDIA's Gaming-segment revenues. The statement was made at the very beginning of the Class Period and was not inaccurate as to the historical source of NVIDIA's Gaming-segment revenues.

2. Knowing or Reckless Statements

To sufficiently plead scienter under the PSLRA, Plaintiffs must "state with particularity facts giving rise to a strong inference that the defendant acted with the required state of mind." 15 U.S.C. § 78u-4(b)(2)(A). "In this circuit, the required state of mind is a mental state that not only covers intent to deceive, manipulate, or defraud, but also deliberate recklessness." *Quality Sys.*, 865 F.3d at 1144 (cleaned up). "To assess whether the complaint meets this standard, we 'must ask: When the allegations are accepted as true and taken collectively, would a reasonable person deem the inference of scienter at least as strong as any opposing inference?'" *Id.* (quoting *Tellabs*, 551 U.S. at 326). Where, as here, Plaintiffs' scienter allegations rely on

the statements of confidential witnesses, the complaint "must pass two hurdles to satisfy the PSLRA pleading requirements." *Zucco*, 552 F.3d at 995. "First, the confidential witnesses whose statements are introduced to establish scienter must be described with sufficient particularity to establish their reliability and personal knowledge. Second, those statements which are reported by confidential witnesses . . . must themselves be indicative of scienter." *Id.* (citations omitted).

We hold that the amended complaint sufficiently alleges that materially false or misleading statements made by Defendant Huang were made knowingly or recklessly. We do not so hold with respect to alleged materially false or misleading statements made by Defendant Kress. In the discussion that follows, we describe only the allegations in the complaint relevant to Defendant Huang's scienter.

a. Alleged Statements by Former Employees

The amended complaint alleges that two unnamed Former Employees, FE 1 and FE 2, had direct knowledge of the degree of Defendant Huang's knowledge.[2] To evaluate

[2] Extensive statements by FE 5 concerning Defendant Huang's scienter are alleged in the amended complaint, in addition to the alleged statements of FE 1 and FE 2. Before the district court ruled on Defendant's motion to dismiss under Rule 12(b)(6), Defendants moved to strike allegations of statements by FE 5. *Iron Workers*, 522 F. Supp. 3d at 671–72. The motion was accompanied by a sworn declaration from a person identifying himself as FE 5. *Id.* The declaration stated that the declarant had not made a number of specific statements attributed to FE 5 in the complaint. *Id.* The district court quite properly, in ruling on a motion to dismiss under Rule 12(b)(6), refused to grant the motion to strike. *Id.* at 672. The court reserved consideration of the truth of the statements in FE 5's declaration for a possible later stage in the proceedings. In the interest of judicial efficiency on remand, we note

whether the Former Employees were described with sufficient particularity to establish their reliability and personal knowledge, we examine "the level of detail provided by the [Former Employees], the corroborative nature of the other facts alleged . . . , the coherence and plausibility of the allegations, the number of sources, the reliability of the sources, and similar indicia." *Id.* (quoting *In re Daou Sys., Inc.*, 411 F.3d 1006, 1015 (9th Cir. 2005), *abrogated on other grounds by Matrixx Initiatives, Inc. v. Siracusano*, 563 U.S. 27, 37–49 (2011)). In essence, we ask whether the complaint describes the Former Employees "with sufficient particularity to support the probability that a person in the position occupied by the source would possess the information alleged." *Daou*, 411 F.3d at 1015 (quoting *Nursing Home Pension Fund, Local 144 v. Oracle Corp.*, 380 F.3d 1226, 1233 (9th Cir. 2004)).

FE 1, mentioned above, was employed by NVIDIA for over ten years as a Senior Account Manager in China. "The China market was NVIDIA's largest by far, accounting for more revenues than the Company's four other regions combined." FE 1 left NVIDIA in December 2017, seven months after the beginning of the Class Period.

"FE 1 explained that NVIDIA kept meticulous track of who was buying its GPUs—not simply directly from the Company, but also from its partners and others down the distribution chain as well." "FE 1 explained that managers from all regions collected this sales data and inputted it into NVIDIA's centralized global sales database . . . ." "FE 1 explained that the GeForce executive team in the United

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that in holding that Plaintiffs have sufficiently alleged Defendant Huang's scienter, we do not rely on any of the alleged statements by FE 5.

States . . . had ready access to the centralized sales database. FE 1 stated that, in addition to the GeForce executive team, Huang and Kress . . . in fact had actual access to this data." "FE 1 described the U.S. executive team as 'obsessed' with this sales data, which explicitly identified and quantified crypto-miners' burgeoning demand for GeForce GPUs throughout the Class Period." "FE 1 recounted that, every quarter, a group of NVIDIA Vice Presidents and other managers met with Huang at 'higher hierarchies' meetings to review the Company's performance. FE 1 stated that emails were circulated within his department in advance of these quarterly meetings. FE 1 also discussed these meetings with his manager (Senior Sales Director Howard Jiang) and other colleagues." "FE 1 stated that NVIDIA Vice Presidents presented sales data reflecting GeForce sales to miners at the quarterly meetings with Huang in 2017. FE 1 learned this fact directly from [Senior Director for China David] Zhang or [Howard] Jiang."

FE 1 recounted that NVIDIA was aware of the "exploding cryptocurrency-related demand for GeForce GPUs through the GeForce Experience data." "GeForce Experience" was software bundled with GeForce GPUs that allowed NVIDIA to track in real time the manner in which GeForce GPUs were being used. "FE 1 emphasized that NVIDIA's top managers regularly analyzed the GeForce Experience data and that they understood the market change—specifically, the increased demand—brought on by cryptocurrency mining. 'We actually know this data,' FE 1 said. Indeed, FE 1 recalled David Zhang, the U.S.-based Senior Director for China, explicitly discussing how GeForce Experience data allowed NVIDIA to track mining usage. Of Defendants' later claims that they could not

determine whether GeForce GPUs were being used for mining, FE 1 scoffed, 'NVIDIA sure lied to everyone.'"

FE 2, also mentioned above, was a Senior Products Director who worked at NVIDIA's headquarters in Santa Clara, California. FE 2 worked at NVIDIA from several years before the Class Period until the beginning of the Class Period in May 2017. "FE 2 personally met with Huang on a monthly basis while at NVIDIA and maintained contact with former senior colleagues after his departure."

FE 2 "confirmed that Huang personally reviewed NVIDIA's sales data through the centralized sales database." FE 2 recollected "that Huang was 'the most intimately involved CEO he had ever experienced' and always knew everything that was occurring in the Company,' a sentiment that FE 2 stated was widely shared. 'Everybody talked about it among the different business groups,' FE 2 recalled."

FE 2 attended some of the quarterly meetings at NVIDIA's Santa Clara headquarters. "FE 2 stated that Huang reviewed everybody's sales data in detail at these meetings, which FE 2 described as 'proctology exams.'" "FE 2 further stated that Huang closely reviewed the GeForce data at these events because GeForce revenues were larger than that of any other group. As FE 2 recalled, 'Jensen [Huang] is a micromanager. He micromanages everything—very little gets done without him being involved.'"

"FE 2 stated that Huang brought up miners' preference for GeForce GPUs during at least two different Quarterly Business Reviews at NVIDIA's Santa Clara headquarters in 2017, which FE 2 attended . . . . Specifically, Huang acknowledged that NVIDIA could not get the cryptocurrency miners to buy the professional and more

expensive Quadro and Tesla cards because miners . . . were only interested in raw cost and 'cranking out algorithms at the lowest cost.' FE 2 also recalled that when Huang stated that miners were buying GeForce GPUs instead of the professional cards, the information came as no surprise to FE 2 or any of the other NVIDIA executives in the room."

Defendant Huang had a "Top 5" weekly email reporting system, in which senior managers throughout the company would report to Huang. "FE 2 was also on the Top 5 distribution list. FE 2 confirmed that Huang had initiated the Top 5 reporting system in 2014 or 2015, that it required senior managers to send their reports by email every Friday, and that Huang personally reviewed the Top 5 emails sent by these senior managers. FE 2 further stated that Huang made a point of telling employees that he had 'super user' status on NVIDIA's IT system and would use it to review all the Top 5 emails."

FE 2 quit working at NVIDIA at the beginning of the Class Period. However, FE 2's statements about Defendant Huang's practices in the period immediately preceding the Class Period—in particular, his micromanaging and attention to detail—are relevant and probative, showing how Huang would have behaved and what he would have known during the immediately following Class Period. Critically, FE 2's statements were not only about Huang's general practices and knowledge. Instead, FE 2's statements specifically concerned what Huang knew about the issue at the heart of this case—the large volume of sales of GeForce GPUs to crypto miners.

b. Alleged Statements by Defendant Huang

Defendant Huang himself publicly stated that he carefully monitored NVIDIA's sales data. For example, as

mentioned above, in response to a question during NVIDIA's August 10, 2017, earnings call, "Huang told investors that 'our strategy is to stay very, very close to the market. We understand its dynamics really well . . . . We know its every single move . . . .'" Repeatedly during earnings calls and in interviews with analysts, Huang showed himself to be familiar with specific revenue numbers attributable to particular categories of sales.

c. Knowingly or Recklessly

We conclude from the foregoing that the amended complaint has sufficiently pleaded that during the Class Period Defendant Huang knowingly or recklessly made false or misleading statements about the degree to which NVIDIA's revenues were dependent on sales of GeForce GPUs to crypto miners. FE 1 and FE 2 portray Huang as a highly competent, extremely detail-oriented manager who would have known that a significant source of NVIDIA's revenues during five quarters comprising most of the Class Period—about $1.126 billion—was from GeForce GPU sales to crypto miners. Indeed, Huang portrayed himself as such a manager.

At this stage of the proceeding, we must accept the allegations in the amended complaint as true. The confidential witnesses were described with sufficient particularity to establish their reliability. The complaint describes FE 1 and FE 2's job titles and experience. *See Quality Sys.*, 865 F.3d at 1145. Further, the amended complaint explains how FE 1 and FE 2 obtained their knowledge. FE 1 personally prepared presentations about sales of GeForce GPUs to crypto miners in China. FE 1 further had frequent communications with high-ranking NVIDIA executives about "the explosion of cryptocurrency-

related demand for GeForce GPUs." FE 1's role placed FE 1 in a reliable position to observe NVIDIA's practice of tracking who purchased its GPUs. Further, FE 1 wrote weekly sales emails about the number of GeForce GPUs being sold to crypto miners throughout 2017. FE 2's basis for personal knowledge is even stronger—FE 2 personally met with Huang on a regular basis and reported to VPs who reported directly to Huang. The level of detail provided by FE 1 and FE 2 further establishes their reliability. *See Zucco*, 552 F.3d at 995.

When these allegations are credited as true, Plaintiffs have sufficiently pleaded scienter as to Huang under the PSLRA. Even if no single allegation, standing alone, is "sufficient to give rise to a strong inference of scienter," a holistic review of all the allegations may "combine to give rise to a strong inference of scienter." *Glazer Cap. Mgmt. L.P. v. Forescout Techs., Inc.*, 63 F.4th 747, 766 (9th Cir. 2023). A holistic review gives rise to such an inference in this case. To summarize Plaintiffs' allegations, they allege that (1) Huang had detailed sale reports prepared for him; (2) Huang had access to detailed data on both crypto demand and usage of NVIDIA's products; (3) Huang was a meticulous manager who closely monitored sales data; and (4) sales data at the time would have shown that a large portion of GPU sales were being used for crypto mining. Huang's access and review of contemporaneous reports are the most direct way to prove scienter. *See Oracle*, 380 F.3d at 1230. Huang himself admitted to closely monitoring sales data. Taken together, these allegations support a strong inference that Huang reviewed sales data showing that a large share of NVIDIA's GeForce GPUs sold during the Class Period were being used for crypto mining.

As to Kress, however, Plaintiffs' amended complaint has not established a strong inference of scienter. The only concrete allegation in the complaint that Kress had access to contradictory information during the Class Period is FE 1's statements that Kress was authorized to access NVIDIA's centralized sales database, and that Kress "could direct VPs . . . to forward the data" to her. These allegations are insufficient to establish a strong inference that Kress personally accessed contradictory information during the Class Period. *See City of Dearborn Heights Act 345 Police & Fire Ret. Sys. v. Align Tech., Inc.*, 856 F.3d 605, 620 (9th Cir. 2017) (finding allegations that defendant had access to data room, standing alone, insufficient to establish actual knowledge). Nor is there evidence that this data is the kind of "relevant fact [] of such prominence that it would be 'absurd' to suggest that management was without knowledge of the matter." *See S. Ferry LP, No. 2 v. Killinger*, 542 F.3d 776, 786 (9th Cir. 2008) (quoting *Berson*, 527 F.3d at 988).

3. Response to Our Dissenting Colleague

Our dissenting colleague disagrees with the foregoing. He contends that Plaintiffs have not sufficiently alleged either falsity or scienter. Our opinion speaks for itself, and we will not repeat what we have written above. However, several of the points made by our colleague merit a specific response.

a. Falsity

i. Sufficiency of Allegations

Plaintiffs allege in their amended complaint (1) that a significant proportion of NVIDIA revenues during the Class Period came from sales of its GeForce GPUs to crypto

miners that were recorded in NVIDIA's Gaming segment rather than in its OEM segment; and (2) that Defendants Huang and Kress falsely denied that those Gaming revenues were based on sales of GeForce GPUs to crypto miners. Our dissenting colleague contends that the complaint does not sufficiently allege that Defendants' representations were false.

Our colleague writes:

> [The amended complaint's] central contention—that NVIDIA executives falsely underreported cryptocurrency-related sales of graphic processing units ("GPUs") by $1.126 billion over the proposed class period—is based entirely on a *post hoc* analysis by the Prysm Group ("Prysm"), an outside expert that relied on generic market research and unreliable or undisclosed assumptions to reach its revenue estimates.

Dissenting Op. at 54. He objects:

> We have never allowed an outside expert to serve as the primary source of falsity allegations where the expert has no personal knowledge of the facts on which their opinion is based, for example by corroborating their conclusions with specific internal information or witness statements.

Id. We disagree with our colleague.

First, Plaintiffs do not base their contention of falsity entirely on the analysis of the Prysm Group. As detailed in

their amended complaint and as recounted above, Plaintiffs rely as well on the independent analysis in the investigative report of RBC, an international investment bank and subsidiary of the Royal Bank of Canada. RBC's conclusion is almost identical to Prysm's.

Our colleague contends that the conclusions of the Prysm Group and RBC are not similar. He writes, "[A]s the district court pointed out, there is a $230 million difference between RBC's and Prysm's revenue estimates." *Id.* at 67. Both the district court and our colleague fail to acknowledge that the period RBC analyzed spanned eighteen months, while the period analyzed by Prysm spanned fifteen months. Plaintiffs point out in their amended complaint the different time spans of the two analyses. As we wrote above, if RBC's revenue estimate is adjusted to reflect a fifteen-month rather than an eighteen-month period, the estimates in the two analyses match almost precisely: RBC ($1.125 billion); Prysm ($1.126 billion).

In addition to the Prysm and RBC analyses, Plaintiffs rely on the statements of FE 1, FE 2, and FE 4, all of whom provide detailed accounts of crypto miners purchasing GeForce GPUs in high volumes. Further, Plaintiffs point to the inescapable and otherwise inexplicable fact that when the price of cryptocurrency and the market for crypto mining GPUs collapsed, NVIDIA was forced on November 15, 2018, at the end of the Class Period, to reduce its revenue forecast by 7%.

Second, contrary to what our dissenting colleague contends, Prysm's assumptions were neither undisclosed nor unreliable. As we describe above, its analytic assumptions were carefully disclosed and, more important, were consistently conservative.

Third, the totality of detailed allegations in Plaintiffs' amended complaint easily satisfies the PSLRA pleading standard for falsity. Prysm and RBC performed rigorous market analyses to reach their independent but nearly identical conclusions. Contrary to our colleague's contention, the PSLRA nowhere requires experts to rely on internal data and witness statements to prove falsity. It merely requires that "the complaint [] state with particularity all facts on which [the] belief [underlying an allegation of falsity] is formed." 15 U.S.C. § 78u-4(b)(1)(B). Prysm did exactly that. To categorically hold that, to be credible, an expert opinion must rely on internal data and witness statements would place an onerous and undue pre-discovery burden on plaintiffs in securities fraud cases. We decline to turn "the PSLRA's formidable pleading requirement into an impossible one." *See Glazer Cap.*, 63 F.4th at 769.

In any event, in the case before us, the amended complaint contains both internal information and witness statements. Some of the revenue information alleged in the complaint is "internal information" that comes from the Defendants themselves. Huang and Kress repeatedly and publicly recited revenue figures for sales of NVIDIA's Crypto SKUs reported in the OEM segment. The failure of those OEM-segment figures to include NVIDIA's revenues from sales of GeForce GPUs to crypto miners is at the heart of Plaintiffs' case. Other revenue information comes from witnesses FE 1 and FE 4, whose statements are detailed and, at this stage of the litigation, unimpeached. *See Berson*, 527 F.3d at 985 (finding statements from internal witnesses sufficient to allege falsity).

The sudden and substantial reduction of NVIDIA's earnings projection that followed collapse of crypto prices lends further credence to Plaintiffs' allegations of falsity.

See Glazer Cap., 63 F.4th at 768 (considering actual market results relevant in determining whether statements were false). Despite previously assuring investors that NVIDIA was insulated from the volatility of crypto prices, when finally forced to confront and explain NVIDIA's revenue drop, Huang attributed it to a "crypto hangover." *See Reese v. Malone,* 747 F.3d 557, 573 (9th Cir. 2014) (finding defendant's admissions that were inconsistent with previous public statements were sufficient to support allegations of falsity), *abrogated on other grounds by Omnicare, Inc. v. Laborers Dist. Council Constr. Indus. Pension Fund*, 575 U.S. 175, 182–86 (2015). Industry analysts and investors were surprised and dismayed at NVIDIA's substantially reduced earnings projections following the crypto crash. Analysts stated that they had believed, based on Defendants' previous statements, that NVIDIA's increased revenues had been based on sales of GeForce GPUs to gamers, not to crypto miners. *See No. 84 Emp.-Teamster Joint Council Pension Tr. Fund v. Am. W. Holding*, 320 F.3d 920, 933, 935–36 (9th Cir. 2003) (finding that plaintiffs sufficiently pleaded materiality in their complaint that included analysts' reactions).

ii. The Slide

Our dissenting colleague places great weight on a slide included in the amended complaint, and on an inaccurate characterization of Plaintiffs' attorney's response to a question about the slide at oral argument. The slide contains a bar chart that had been prepared at the request of Defendant Fisher for a presentation by NVIDIA's "China team." *See* Dissenting Op. at 57 (reproducing the slide).

Our colleague contends that the slide "reveals that the Crypto SKU drew mining-related demand away from

GeForce GPUs after its launch in May 2017—exactly what Defendants described in their public statements." *Id.* Our colleague describes the slide and then characterizes Plaintiffs' attorney's response to the presentation at oral argument. He writes:

> Prior to the launch of the Crypto SKU, 100% of estimated mining-related demand was filled by gaming GPUs. By June, GeForce GPUs accounted for 64% of sales to miners in China, and by July, its proportion of sales had decreased to 27%. Thus, by July 2017, 73% of estimated mining demand in China was fulfilled by sales of the Crypto SKU (271,884 units sold, compared to an estimated 100,000 GeForce GPUs sold). As Plaintiffs' counsel effectively conceded at oral argument, at least with respect to the Chinese cryptocurrency market, the China study corroborates Defendants' statements in 2017 that the large majority of cryptocurrency demand was being met by Crypto SKU sales.

Id. at 57–58.

Our colleague makes three mistakes. First, he misunderstands the nature and purpose of the slide. Second, he misstates what is on the slide. Third, he mischaracterizes Plaintiffs' attorney's response to his questions about the slide.

First, the slide was part of a presentation that hurt rather than helped Defendants' case. Far from relying on the slide, Defendants run away from it. In their brief to us, they write

not only that Defendants never saw the slide. They also write that the numbers in the slide are "estimates" that cannot be trusted:

> Plaintiffs highlight a September 2017 presentation with an analysis of mining's impact in China, which allegedly included a "China sales team" estimate of NVIDIA's share of estimated mining-related GPU sales in China during portions of 2017. Yet, Plaintiffs fail to allege that either Huang or Kress ever received the presentation or were aware of the "estimates" it contained. While Plaintiffs claim that Fisher "commissioned" the "study," they do not allege that he ever received it . . . . Moreover, Plaintiffs provide zero explanation of how the estimates were arrived at, or of their reliability.

(Internal citations omitted; emphasis removed.)

Defendants run away from the slide because it was part of an internal NVIDIA presentation recommending an aggressive plan to increase sales of GeForce GPUs—not Crypto SKUs—for crypto mining in China. Another slide in the presentation "reflected that, between January and September 2017, NVIDIA had sold 1.5 million GeForce GTX units to cryptocurrency miners in China." "Based on the conservative price point of $150 per unit (GTX GPUs sell for as high as $800 per unit, depending on the model), this sales number translated into a minimum of *$225 million* in GeForce revenues from the China market alone." (Emphasis in original.) "Another slide, titled 'New Market, New Business Model,' detailed how NVIDIA would exploit

the crypto-mining market to boost GeForce sales." "Reflecting NVIDIA's eagerness to exploit the new cryptocurrency boom's effect on GeForce sales, a slide near the end of the presentation listed ten large commercial mining firms operating in China by name, next to which was the mine owner's name, cell phone number or email address, existing mining GPUs, and 'Monthly demand & forecast (Units)' . . . ."

Second, our colleague states that "at least with respect to the Chinese cryptocurrency market, the China study corroborates Defendants' statements in 2017 that the large majority of cryptocurrency demand was being met by Crypto SKU sales." Dissenting Op. at 58. The "China study" and the slide corroborate no such thing.

The bar chart on the slide shows that 840,000 GeForce GPUs were sold in China during four months—April through July—beginning one month before the start of the Class Period. It shows that during those four months, 485,878 Crypto SKUs were sold in China. Only in July did sales of Crypto SKUs exceed sales of GeForce GPUs. During the preceding three months, sales of GeForce GPUs far exceeded sales of Crypto SKUs. During the four-month period of Chinese sales covered by the slide, the "large majority of cryptocurrency demand was being met" by sales of GeForce GPUs rather than by sales of Crypto SKUs. At the bottom of the slide is a statement that NVIDIA's GPU market share in China is greater than 70%.

Our colleague contends that the bar chart, showing that Crypto SKUs outsold GeForce GPUs in July 2017, "illustrates" a "trend." *Id.* There is nothing in the record to show that this is so. Indeed, the Prysm study concluded just the opposite. July 2017 was the last month in the second-

quarter fiscal year 2018, the first of the five quarters in the Prysm study. In the third-quarter fiscal year 2018, the second quarter in the study, global sales of GeForce GPUs to crypto miners totaled about $229 million while sales of Crypto SKUs totaled only about $70 million. That is, in the three months immediately following July 2017, GeForce GPUs outsold Crypto SKUs to crypto miners globally by a ratio of over three to one. In the next quarter, that ratio was over six to one.

Our colleague faults us for "want[ing] to have it both ways." He contends that we are "arguing, on the one hand, that [the slide] cannot be extrapolated to reflect global cryptocurrency trends, while on the other hand relying on the same market share estimate to buttress Prysm's claim that NVIDIA had a 69% share of the *global* cryptocurrency market." *Id.* (emphasis in original). We are not trying to have it "both ways."

We do not argue that the slide, taken as a whole, cannot be extrapolated. We argue only that our colleague's extrapolation from sales in July 2017, the last of the four months shown on the slide, is unsupported. Nor do we argue that it was improper for Prysm to use NVIDIA's own statement that its China market share was greater than 70% to support Prysm's global market share estimate of 69%. The bar chart and the market share estimate on the slide both tell a consistent story. They both show that NVIDIA sold an enormous number of GeForce GPUs for crypto mining in China.

Third, our colleague puts words in Plaintiffs' attorney's mouth. Our colleague contends that Plaintiffs' attorney "effectively conceded at oral argument, at least with respect to the Chinese cryptocurrency market, the China study

corroborates Defendants' statements in 2017 that the large majority of cryptocurrency demand was being met by Crypto SKU sales." *Id.* Plaintiffs' attorney did no such thing. He did not effectively concede that the large majority of cryptocurrency demand in China was met by Crypto SKU sales; nor did he effectively concede anything with respect to sales in China outside of the four-month period.

To set the stage for what Plaintiffs' attorney actually said at oral argument, we first recount a prior exchange between our colleague and Defendants' attorney:

> Q [by our colleague]: I looked at this slide and drew something else and I wanted to hear your thoughts about it. If the green bar for GTX—for the GeForce—it seems to be going down after the introduction of the crypto SKU. And if the grey bar is what represents the crypto SKU sales, then it does indeed seem by June and July that crypto was capturing more of the demand in the market. Am I reading that correctly from this particular slide, *assuming we can extrapolate this information both to individual defendants and to global sales?*
> A: *Yes, and that's an important caveat.* But yes, that's how I would read that slide, as well. And remember, the company introduced this new crypto SKU in May of 2017. It's a brand new product and a brand new market for them. And in the first three months they sold $150M worth of it. And I do think that kind of information would inform a judgment about how much of the

> mining demand they have been able to serve with this new product.
> Q: So, let me just make sure. *So, if this slide accurately reflected global sales*—and I know this is just China—*then one could argue* that this statement that the majority or vast majority—however you want to characterize it—of crypto SKU sales captured the mining demands would not be incorrect? *If this were true.*
> A: *That's how I would read it your honor*.

(Emphases added.)

To his credit, Defendants' attorney did not overstate the importance of the slide. After our colleague said, "assuming we can extrapolate this information both to the individual defendants and to global sales," Defendants' attorney responded, "[T]hat's an important caveat." After our colleague hypothesized "if the slide accurately reflected global sales" and posited "[i]f this were true," Defendants' attorney responded, given the two "ifs," that he would also so read the slide. Defendants' attorney never said, or even suggested, that the slide should be extrapolated to sales outside China and outside the specified four-month period.

When Plaintiffs' attorney came to the podium for rebuttal, he immediately responded to the exchange between our colleague and Defendants' attorney. He said:

> Let me address the chart first, all right? And your honor's question, can it be generalized, that this trend for this period of time extended. And the answer is that's why

> Plaintiff's counsel had an independent economic study done.

Far from "effectively conced[ing]" that "the large majority of cryptocurrency demand was being met by Crypto SKU sales" in China in 2017, Plaintiffs' attorney responded that counsel "had an independent economic study done" to determine whether the four-month data from China could be "generalized" and "extended" to determine global sales. As described above, the Prysm study determined that the July 2017 sales data, upon which our colleague relies, *could not be* generalized and extended. However, it determined that the sales data for the full four months depicted on the slide *could be* generalized and extended. Relying in part on the sales data on the slide, the Prysm study concluded that NVIDIA hid approximately $1.126 billion in GeForce GPU sales to crypto miners during a fifteen-month period. The RBC study determined the same thing for a longer period. According to RBC, NVIDIA hid $1.35 billion in GeForce GPU sales during an eighteen-month period.

b. Scienter

In their amended complaint, Plaintiffs provide a number of reasons supporting a conclusion that Huang, the CEO of NVIDIA, knew that more than a billion dollars in company revenues came from selling GeForce GPUs to crypto miners. We state the obvious. A CEO who does not know the source of $1.126 billion in company revenues during fifteen-month period, or $1.35 billion during an eighteen-month period, is unlikely to exist. Or if such a CEO does exist, he or she is not likely to remain CEO for very long. It is "reasonable to infer" that Huang's "detail-oriented management style" would have led him "to become aware of" the source of more than a billion dollars in company revenue during a fifteen-

or eighteen-month period. *See Oracle*, 380 F.3d at 1234 ("It is reasonable to infer that Oracle executives' detail-oriented management style led them to become aware of the allegedly improper revenue recognition of such significant magnitude that the company would have missed its quarterly earnings projections but for the adjustments.").

B. Section 20(a) of the Exchange Act

The amended complaint alleges that individual Defendants violated Section 20(a) of the Exchange Act, 15 U.S.C. § 78t, "which assigns joint and several liability for any person who 'controls any person liable' under Section 10(b)." *Quality Sys.*, 865 F.3d at 1149 (quoting 15 U.S.C. § 78t(a)). Section 20(a) requires plaintiff to allege (1) a primary violation of federal securities law; and (2) that defendant exercised actual power or control over the primary violator. *Howard v. Everex Sys., Inc.*, 228 F.3d 1057, 1065 (9th Cir. 2000) (citing *Hollinger v. Titan Cap. Corp.*, 914 F.2d 1564, 1575 (9th Cir. 1990)).

Because we hold that the amended complaint does not sufficiently plead a cause of action under Section 10(b) of the Exchange Act and Rule 10b-5 against Defendants Kress and Fisher, the only alleged primary violation is that committed by NVIDIA through its CEO, Defendant Huang. Plaintiffs fail to allege that Kress and Fisher exercised actual power or control over Huang. *See Paracor Fin., Inc. v. Gen. Elec. Cap. Corp.*, 96 F.3d 1151, 1163–64 (9th Cir. 1996) (noting that merely being an officer of a corporation does not establish control). However, neither party briefed whether (1) NVIDIA can be deemed a primary violator through imputation; and (2) Huang's control over his own conduct can satisfy Section 20(a).

Therefore, while we affirm the district court's dismissal of Plaintiffs' Section 20(a) claims against Defendants Kress and Fisher, we vacate the district court's dismissal of the Section 20(a) claims as to Defendant Huang and remand for further proceedings as to those claims.

Conclusion

We hold that Plaintiffs have stated a claim for relief under Section 10(b) and Rule 10b-5 against Defendants Huang and NVIDIA, but not against Defendants Kress and Fisher. The amended complaint sufficiently alleges that, during the Class Period, Huang made false or misleading statements and did so knowingly or recklessly. "While the PSLRA 'significantly altered pleading requirements in private securities fraud litigation,' it did not impose an insurmountable standard." *In re VeriFone Holdings, Inc. Sec. Litig.*, 704 F.3d 694, 708 (9th Cir. 2012) (internal citation omitted) (quoting *Daou*, 411 F.3d at 1014). We reverse and remand for further proceedings consistent with this opinion.

The parties shall bear their own costs on appeal. *See* Fed. R. App. P. 39(a)(4).

AFFIRMED in part, REVERSED in part, and REMANDED.

SANCHEZ, J., dissenting:

The Private Securities Litigation Reform Act of 1995 ("PSLRA") imposes "formidable pleading requirements to properly state a claim" for securities fraud. *Glazer Cap. Mgmt., L.P. v. Forescout Techs., Inc.*, 63 F.4th 747, 765 (9th Cir. 2023) (quoting *Metzler Inv. GMBH v. Corinthian Colls., Inc.*, 540 F.3d 1049, 1055 (9th Cir. 2008)). "Congress enacted the PSLRA to put an end to the practice of pleading fraud by hindsight." *In re Daou Sys. Inc. Sec. Litig.*, 411 F.3d 1006, 1021 (9th Cir. 2005) (internal quotation marks and citation omitted). To survive dismissal under the PSLRA, a complaint must "specify each statement alleged to have been misleading [and] the reason or reasons why the statement is misleading" to allege the element of falsity adequately, and "state with particularity facts giving rise to a strong inference that the defendant acted with the required state of mind" to allege the element of scienter. 15 U.S.C. § 78u–4(b)(1)–(2).

Plaintiffs' first amended complaint ("FAC") does not meet these exacting pleading requirements. The FAC's central contention—that NVIDIA executives falsely underreported cryptocurrency-related sales of graphic processing units ("GPUs") by $1.126 billion over the proposed class period—is based entirely on a *post hoc* analysis by the Prysm Group ("Prysm"), an outside expert that relied on generic market research and unreliable or undisclosed assumptions to reach its revenue estimates. We have never allowed an outside expert to serve as the primary source of falsity allegations where the expert has no personal knowledge of the facts on which their opinion is based, for example by corroborating their conclusions with specific internal information or witness statements.

Further, Plaintiffs' allegations do not raise a strong inference of scienter. The FAC does not allege with particularity the contents of *any* internal report or data source that would have put NVIDIA's executives on notice that their public statements were false or misleading when made, much less any internal source that corroborated Prysm's revenue estimates. Indeed, the only specific allegation the FAC makes of an internal study that examined cryptocurrency-related GPU sales in China *supports* Defendants' statements that most of the cryptocurrency demand was serviced by a new product designed specifically for cryptocurrency miners—the "Crypto SKU." At bottom, Plaintiffs' theory that Defendants launched the crypto card to deliberately mislead investors about the true extent of cryptocurrency revenues earned in its Gaming segment does not present a cogent or compelling inference of scienter under the PSLRA. Because the district court did not err in dismissing Plaintiffs' case, I respectfully dissent.

I. BACKGROUND

Plaintiffs contend that NVIDIA violated federal securities laws by concealing the extent to which NVIDIA's gaming GPUs, including its flagship product, the GeForce GPU, were sold downstream to cryptocurrency miners during a proposed class period from May 2017 through November 2018. The majority's factual recitation omits important context for analyzing Plaintiffs' allegations of fraud.

NVIDIA executives made no secret of the fact that demand for its GPUs increased in 2017 as prices for certain cryptocurrencies rose and miners began purchasing GPUs for computational tasks. On an August 10, 2017, second-quarter earnings call, NVIDIA's Executive Vice President

and Chief Financial Officer, Colette Kress, stated that "GPU sales were lifted by demand from increasingly mining activity, or Ethereum."[1] NVIDIA co-founder and Chief Executive Officer Jensen Huang added that the company was responding to this demand by "offer[ing] the coin miners a special coin-mining SKU, [a] . . . GPU configuration . . . optimized for mining."

NVIDIA launched the Crypto SKU in May 2017, a GPU designed specifically for miners. Crypto SKUs have the same processing power as other NVIDIA GPUs but were stripped of the video functionality required for gaming. According to NVIDIA executives, the Crypto SKU was introduced to address new mining demand while ensuring adequate supplies of GPUs for its gaming end users. Because the new crypto cards could not be used for gaming, revenues from Crypto SKU sales were reported in the company's Original Equipment Manufacturer and Intellectual Property ("OEM") segment rather than the Gaming segment. The Crypto SKU gave NVIDIA and investors greater visibility into the revenue stream from cryptocurrency demand, and selling a dedicated crypto card reduced the likelihood that when cryptocurrency prices fell, miners would dump these GPUs onto a secondary market and collapse demand for NVIDIA's gaming GPUs.

The FAC highlights an internal study prepared in September 2017 that estimated NVIDIA's cryptocurrency-related sales in China.

[1] As the majority explains, NVIDIA's fiscal year 2018 quarters cover the following periods: February to April 2017 (1Q); May to July 2017 (2Q); August to October 2017 (3Q); November 2017 to January 2018 (4Q).

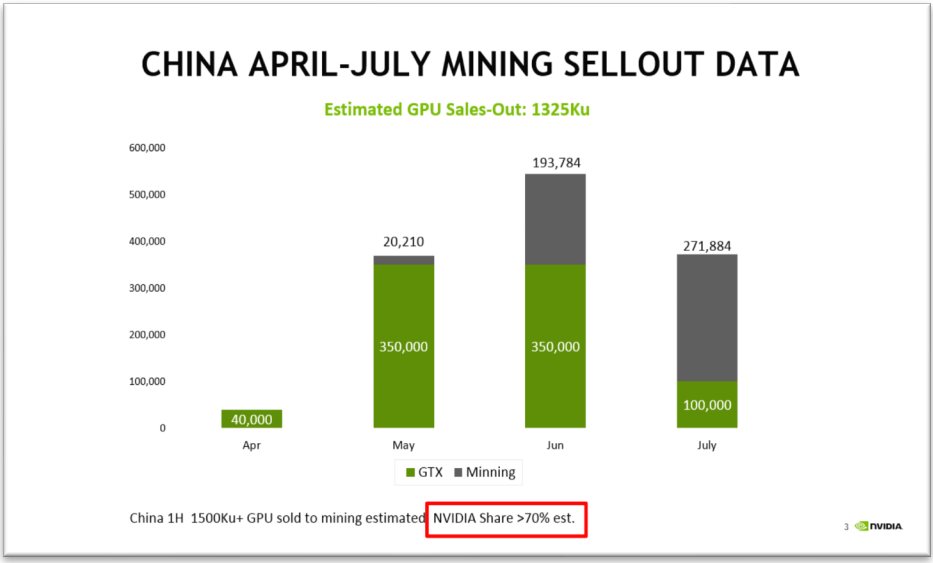

Figure F. Sept. 2017 NVIDIA China Cryptocurrency Study
Source: NVIDIA Corp.

In one slide of the study, labeled Figure F, Plaintiffs allege that NVIDIA sold an estimated 800,000 GeForce GTX GPUs to miners in China from May through July 2017. Plaintiffs also rely on Figure F to assert that NVIDIA's share of the cryptocurrency market in China was estimated to be 70%.

Figure F reveals that the Crypto SKU drew mining-related demand away from GeForce GPUs after its launch in May 2017—exactly what Defendants described in their public statements. Prior to the launch of the Crypto SKU, 100% of estimated mining-related demand was filled by gaming GPUs. By June, GeForce GPUs accounted for 64% of sales to miners in China, and by July, its proportion of sales had decreased to just 27%. Thus, by July 2017, 73% of estimated mining demand in China was fulfilled by sales

of the Crypto SKU (271,884 units sold, compared to an estimated 100,000 GeForce GPUs sold). As Plaintiffs' counsel effectively conceded at oral argument, at least with respect to the Chinese cryptocurrency market, the China study corroborates Defendants' statements in 2017 that the large majority of cryptocurrency demand was being met by Crypto SKU sales.[2]

My colleagues in the majority seek to explain away Figure F by arguing that the trend it illustrates—Crypto SKU sales overtaking GeForce GPU sales in China—cannot be generalized beyond the four-month period it displays or beyond the Chinese market. *See* Majority Op. at 47–51. The majority wants to have it both ways: arguing, on the one hand, that Figure F cannot be extrapolated to reflect global cryptocurrency trends, while on the other hand relying on the same market share estimate to buttress Prysm's claim that NVIDIA had a 69% share of the *global* cryptocurrency market. *See* Majority Op. at 20–21. The majority even claims that there is no evidence of a trend because sales of Crypto SKU only overtook GeForce GPU sales in July. Lumping together the prior three months of GeForce GPU sales (including the month *before* the launch) ignores the obvious point—the Crypto SKU captured 73% of estimated mining demand in China within three months of its introduction in May.

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[2] Plaintiffs' counsel did not dispute the suggestion that demand for Crypto SKUs was overtaking demand for GeForce GPUs in China. Instead, Plaintiffs' counsel addressed the slide by noting that "the experience in China is the experience in China," but their "independent economic study" (referring to the Prysm report) gave different sales estimates "outside" of China. In other words, Plaintiffs' counsel was acknowledging the impact of the Crypto SKU on sales in China but arguing it should not be generalized to global sales.

To be clear, there are many reasons to question the reliability of the China study. Plaintiffs do not allege any facts demonstrating that Defendants Huang or Kress ever saw this study. Nor do Plaintiffs describe what sources of information or analyses the study relied upon for its estimate of GPU sales or NVIDIA's share of the cryptocurrency market in China. The point is, *even if* the internal China study were deemed sufficiently reliable, its information serves to *confirm* rather than undercut Defendants' challenged public statements in August and September 2017.

On an August 2017 earnings call, Huang stated that the "large majority of the cryptocurrency demand [was now served] out of that specialized product[]," reporting $150 million in revenues from the sale of Crypto SKUs in the second quarter. Kress stated that NVIDIA served a "large portion of this specialized [cryptocurrency] market" with the dedicated cryptocard while acknowledging that miners continued buying both GeForce GPUs and Crypto SKUs. Kress made the same points at a September 6, 2017, business conference for investors. Plaintiffs have not identified any internal report or data source that contradicts these public statements.

From spring 2017, the start of the proposed class period, to January 2018, Ethereum rose from $400 per token to $1,400 per token. During a third-quarter earnings call on November 9, 2017, Kress reported $1.56 billion in gaming revenue and $70 million in OEM revenue. Kress acknowledged that "GPU sales also benefited from continued cryptocurrency mining. We met some of this demand with a dedicated board in our OEM business and a portion with GeForce [GPU], though it's difficult to quantify." At a company presentation on November 29,

2017, Kress was asked again to quantify how much cryptocurrency demand was reflected in gaming revenue. Kress explained that the Crypto SKU had been introduced to "make sure that we supplied the overall cards that we needed to our gamers . . . . However, in certain times, if there is not the overall availability [of Crypto SKUs] and/or if price of Ethereum reaches high levels," a certain portion of sales will involve purchasers who use gaming cards for both "gaming and mining at the same time." Kress added, "[T]here probably is some residual amount or some small amount" of those purchases that NVIDIA cannot "visibly count" but "[w]e do believe the majority does reside in terms of our overall [Crypto SKU]."

On February 8, 2018, NVIDIA reported financial results for the fourth quarter ending January 28, 2018. Over the fourth quarter, the price of Ethereum surged from $276 per token to a high of $1,422 per token. During that earnings call, Kress again addressed the impact of Ethereum price increases on NVIDIA's business segments:

> Strong demand in the cryptocurrency market exceeded our expectations. We met some of this demand with a dedicated board in our OEM business, and some was met with our gaming GPUs. This contributed to lower than historical channel inventory levels of our gaming GPUs throughout the quarter. While the overall contribution of cryptocurrency to our business remains difficult to quantify, we believe it was a higher percentage of revenue than the prior quarter. That said, our main focus remains on

> our core gaming market as cryptocurrency trends will likely remain volatile.[3]

Huang also noted that "there's a fairly sizeable pent-up demand going into this quarter" for gaming GPUs caused by limited channel inventory and high prices being charged at the retail level. Gamers were getting priced out of the market for GeForce GPUs, and because NVIDIA does not "set prices at the end of the market," Huang explained that "the best way for us to solve this problem" is "to keep working on the supply" of GeForce GPUs.

On May 10, 2018, NVIDIA announced its financial results for the first quarter of fiscal year 2019, reporting gaming revenue of $1.72 billion and Crypto SKU revenue of $289 million. Kress reported the supply of GPUs was "now easing," with channel prices "beginning to normalize, allowing gamers who had been priced out of the market last quarter to get their hands on the new GeForce [GPU] at a reasonable price." Kress added, "Cryptocurrency demand was again stronger than expected, but we were able to fulfill most of it with crypto-specific GPUs" and "[a]s a result, we could protect the vast majority of our limited GPU supply for use by gamers."

In 2018, the price of Ethereum began a precipitous fall from its January peak. By late March, the price of Ethereum had fallen below $400 and by November it had fallen below $200 per token. On August 16, 2018, NVIDIA announced its financial results for the second quarter, reporting OEM revenues from the Crypto SKU at just $18 million. Kress stated that the company was now projecting no contributions

[3] Plaintiffs do not allege that any false or misleading statements were made on this earnings call.

from cryptocurrency going forward. NVIDIA lowered its third-quarter revenue guidance by 2.2% to $3.25 billion. When asked to "look[] backwards" to estimate the size of GeForce GPU business driven by cryptocurrency, Huang responded,

> It's hard to estimate no matter what. . . . [As for] how much of GeForce could have been used for crypto, a lot of gamers at night, they could—while they're sleeping, they could do some mining. And so[,] whether they buy it for mining or . . . for gaming, it's kind of hard to say. And some miners were unable to buy our OEM products, and so they jumped onto the market to buy it from retail. And that probably happened a great deal as well.

On November 15, 2018, NVIDIA announced it had missed revenue projections for the third quarter by 2%. Kress stated that "[g]aming [revenue] was short of expectations" because "post crypto channel inventory took longer than expected to sell through" as "[g]aming card prices, which were elevated following the sharp crypto falloff, took longer than expected to normalize." NVIDIA announced a further 7% decline in revenue the following quarter when compared to the prior year. NVIDIA's stock dropped 28.5% over the next two trading sessions. This lawsuit followed.

II. FALSITY

Plaintiffs' securities fraud action rests on the theory that Defendants knew but concealed the extent to which GeForce GPUs were purchased downstream by cryptocurrency miners over the proposed class period. The FAC challenges

thirteen statements made by NVIDIA executives as false or misleading because the statements failed to disclose the true extent of cryptocurrency-related revenues in NVIDIA's Gaming segment.[4]

To establish the falsity of these statements, Plaintiffs rely almost entirely on an expert report prepared by Prysm, an economic consulting firm hired for this litigation. Plaintiffs allege that Prysm "performed a rigorous demand-side analysis to determine the amount of NVIDIA revenues attributable to crypto-related sales from May 2017 through July 2018." Prysm estimated that NVIDIA earned $1.728 billion from cryptocurrency-related revenue over the fifteen-month period. Because NVIDIA reported $602 million in revenue in its OEM segment from the sale of Crypto SKUs over that period, Prysm concluded that NVIDIA had understated its crypto-related GeForce GPU sales by $1.126 billion. Relying on Prysm's revenue estimates, Plaintiffs prepared a chart depicting, on a fiscal quarter-by-quarter basis, the amount of cryptocurrency-related revenue Defendants allegedly failed to disclose over the class period. *See* Majority Op. at 18 (reproducing the chart).

Although the adequacy of Plaintiffs' falsity allegations was not addressed by the district court in its dismissal of the FAC, the majority reaches that question here. The majority determines, based on Prysm's after-the-fact revenue estimates, that Defendants Huang and Kress made materially false or misleading statements when they failed to disclose that "a very substantial part" of NVIDIA's Gaming segment included crypto-related revenue. Majority Op. at 23. For example, the majority concludes that Huang's report of $150

[4] For the reasons explained by the majority, I agree that Defendant Jeff Fisher's statement, made on May 10, 2017, is not actionable.

million in revenues from Crypto SKU sales on an August 10, 2017, earnings call was materially false or misleading because "Huang failed to say that during that same quarter NVIDIA had received about $349 million in crypto-related revenues, of which about $199 million was due to sales of GeForce GPUs." Majority Op. at 24. The majority essentially concludes that Plaintiffs have adequately alleged falsity merely by showing that Defendants' statements concerning cryptocurrency-related revenues diverged from Prysm's *post hoc* revenue estimates.

Our precedent permits a plaintiff in a securities fraud action to support allegations of falsity with an expert opinion. *See, e.g.*, *Nursing Home Pension Fund, Loc. 144 v. Oracle Corp.*, 380 F.3d 1226, 1233–34 (9th Cir. 2004); *Glazer*, 63 F.4th at 768. But we have never before allowed an outside expert to serve as the *primary* source of falsity allegations under the PSLRA where the expert relies almost exclusively on generic market research and without any personal knowledge of the facts on which their opinion is based. Under the PSLRA, Plaintiffs must describe their experts' allegations "with sufficient particularity to establish that they [are] in a position to know" the basis for their opinion. *Oracle*, 380 F.3d at 1228.

In *Oracle*, plaintiffs alleged that Oracle released a defective software product that sold poorly and "covered up its losses by creating phony sales invoices and improperly recognizing past customer overpayments as revenue." *Id.* In reaching the conclusion that Oracle had improperly characterized $228 million in customer overpayments as revenue, plaintiffs' expert reviewed the billing and payment histories of several Oracle customers and interviewed several Oracle employees. *Id.* at 1233. We observed that the complaint had alleged with particularity the grounds

upon which the expert based his conclusions, including the contents of internal documents reviewed by the expert and information he had learned from former employees. *Id.* "More importantly," we emphasized, the billing and payment histories analyzed by the expert "themselves appear to establish improper revenue adjustment," directly corroborating the expert's assessment. *Id.*

Here, in contrast, Plaintiffs do not allege that Prysm's revenue estimates are based on information provided by any current or former NVIDIA employee or any internal report or data source. Rather, Prysm's "demand-side" analysis relies on a series of assumptions drawn from generic market research. *First*, Prysm estimates the amount of additional computing power (known as the "hashrate") being used to mine cryptocurrency tokens in three popular blockchain networks; *second* Prysm approximates the total number of GPU units that would need to be sold to account for this computational need; *third*, Prysm reckons NVIDIA's share of GPU sales based on the company's estimated market share of the cryptocurrency market; *finally*, Prysm provides its best guess about NVIDIA's total cryptocurrency-related revenues by applying an average manufacturer's suggested retail price for each estimated GPU unit sold (along with further estimated adjustments to the retail markup).

The district court dismissed Plaintiffs' earlier consolidated class action complaint ("CCAC") for failure to adequately plead both falsity and scienter. The district court concluded that Plaintiffs' falsity allegations did not satisfy the PSLRA's pleading standards because Plaintiffs "fail[ed] to describe Prysm's assumptions and analysis with sufficient particularity to establish a probability that its conclusions are reliable." For example, Plaintiffs provided "no allegations supporting a major assumption underlying the expert

analysis: that NVIDIA's market share in the crypto mining market is equal to its market share in the gaming market." As the district court observed, if NVIDIA's mining market share is lower than its gaming market share, Prysm's report "could significantly overstate NVIDIA's estimated revenues from mining."[5] In response, Plaintiffs' FAC removed all reference to the third-party market researcher that had equated NVIDIA's gaming and cryptocurrency market share and alleged instead that Prysm was now relying on a different third-party market analyst ("Peddie Report"), which estimated NVIDIA's share of the global GPU mining market to be 69%. Despite substituting one material assumption for another, Prysm's estimate of NVIDIA's cryptocurrency revenues over the class period remained precisely the same.

Plaintiffs' amended allegations do not cure the deficiencies found by the district court. Plaintiffs acknowledge that the Peddie Report uses "proprietary analytic models to estimate NVIDIA's market share," meaning there is no way to know from the FAC *how* the Peddie Report determined NVIDIA's share of the

[5] The district court also noted that Defendants challenged the adequacy of several other assumptions made by Prysm:

> The Complaint does not explain, among other things, the relevance of other cryptocurrencies focused on by Prysm, the source of the hashrate data, what demand (if any) Prysm assumed was met with [application-specific integrated circuits] or other non-GPU products, which of the "various popular GPUs" Prysm considered in its calculations, what market share data was used, or what Prysm's "conservative price and hashrate estimates" were.

Many of these assumptions remain unexplained in the FAC.

cryptocurrency market. This is a critical omission, as Prysm's estimate of NVIDIA's market share forms the baseline multiplier for NVIDIA's estimated revenue from miners over the class period. Without knowing the basis for this input, one cannot ascertain the reliability of the output. The majority asserts that Prysm provides a "detailed analysis to support its conclusions," but never addresses this glaring omission. *See* Majority Op. at 19–22. In addition, the Peddie Report's market-share estimates were for just two quarters in 2017, and the FAC alleges no facts to support Prysm's assumption that market share throughout the class period can be reliably extrapolated from this limited period.

Plaintiffs contend that Prysm's estimates are nevertheless reliable because another market analyst, Royal Bank of Canada Capital Markets ("RBC"), also concluded that NVIDIA had understated crypto-related revenue by $1.35 billion from February 2017 to July 2018. But the FAC does not describe in any detail RBC's own assumptions or sources of information to estimate NVIDIA's cryptocurrency market share or overall cryptocurrency revenues. And as the district court pointed out, there is a $230 million difference between RBC's and Prysm's revenue estimates.[6]

The majority repeats the same error. It contends that Prysm's revenue estimates and cryptocurrency market share

[6] The majority contends there is not an actual difference between RBC's revenue estimate and Prysm's revenue estimate if RBC's estimate is adjusted to reflect a fifteen-month period rather than an eighteen-month period. *See* Majority Op. at 42. But because the FAC alleges no facts to support how RBC estimated NVIDIA's cryptocurrency market share to be 75% or other assumptions underlying its analysis, this begs the question whether such an adjustment is grounded in any reliable source or methodology.

assumptions are corroborated by the RBC report. *See* Majority Op. at 21–23. Plaintiffs cannot satisfy the PSLRA's heightened pleading requirements by pointing to another third-party report that itself fails to disclose material assumptions or methods of analysis. *See In re Nektar Therapeutics Sec. Litig.*, 34 F.4th 828, 837 (9th Cir. 2022) ("Plaintiffs cannot evade the PSLRA's exacting pleading standards by merely citing an expert who makes assertions about falsity based on questionable assumptions and unexplained reasoning."). Prysm's cryptocurrency-revenue estimates amount to a series of educated guesses about the computational power needed to support certain blockchain networks and NVIDIA's potential sales of GPUs to meet this estimated demand. But because the FAC fails to describe in sufficient detail the basis for Prysm's estimate of NVIDIA's cryptocurrency market share or other core assumptions underlying Prysm's revenue estimates, the complaint fails to establish the reliability of Prysm's conclusions.

The majority defends Prysm's analysis as written by two credentialed authors who specialize in the economics of blockchain and who applied "conservative" estimates at several steps along the way of their analysis. However qualified the authors may be to offer generalized allegations about cryptocurrency economics, the amended complaint does not plead with particularity facts establishing that the Prysm report's authors were "in a position to know" what NVIDIA's own internal revenue reporting showed. *Oracle*, 380 F.3d at 1233. "The most direct way to show both that a statement was false when made and that the party making the statement knew that it was false is via contemporaneous reports or data, available to the party, which contradict the statement." *Id.* at 1230. Unlike the complaint in *Oracle,* the FAC does not allege that Prysm reviewed any internal

documents or relied on any NVIDIA employee interviews to corroborate its revenue estimates, nor does it allege with particularity the contents of any contemporaneous report that directly contradicts Defendants' challenged statements. *See id.* at 1233; *see also Lipton v. Pathogenesis Corp.*, 284 F.3d 1027, 1036 (9th Cir. 2002) ("[A] proper complaint which purports to rely on the existence of internal reports would contain at least some specifics from these reports as well as such facts as may indicate their reliability." (internal quotation marks omitted)).

The majority's approach significantly erodes the heightened pleading requirements for alleging securities fraud under the PSLRA. Our precedent establishes that for both confidential and expert witnesses, plaintiffs must describe these witnesses with "sufficient particularity to support the probability that a person in the position occupied by the source would possess the information alleged." *Oracle*, 380 F.3d at 1233 (quoting *Novak v. Kasaks*, 216 F.3d 300, 314 (2d Cir. 2000)). Under the majority's reasoning here, however, falsity can be established simply by producing an expert witness whose *post hoc* calculations diverge from a defendant's prior public statements, even when the complaint fails to allege any facts to establish that the expert's conclusions correspond to what a company's internal data or documents might have shown. *See Khoja v. Orexigen Therapeutics, Inc*., 899 F.3d 988, 1008 (9th Cir. 2018) ("Falsity is alleged when a plaintiff points to defendant's statements that directly contradict *what the defendant knew at the time*." (emphasis added)). I do not suggest that an expert opinion *must* rely on internal data or witness statements to be found reliable for purposes of particularized pleadings under the PSLRA. But when Prysm does not rely on any internal data source or employee as a

basis for its revenue estimates, and Plaintiffs have also failed to allege with particularity the contents of any internal data source or report that could corroborate Prysm's revenue estimates, Plaintiffs' allegations are inadequately pled. Far from being an impossible standard, we have consistently applied such a requirement. *See, e.g.*, *Oracle*, 380 F.3d at 1233; *Nektar*, 34 F.4th at 837; *Glazer*, 63 F.4th at 768.

Finally, the majority contends that the statements of several former employees ("FEs") support Prysm's conclusions. FE 1, a senior account manager in China, alleged that "beginning in 2016 and continuing through 2017, mining enterprises placed huge orders for GeForce GPUs from NVIDIA's partners [in China], often in quantities of 50,000 or 100,000 per order." FE 2, a senior products director in Santa Clara, California, observed that "GeForce Gaming GPUs were the clear favorites among crypto-miners." FE 4, a community manager in Russia, described ongoing demand for GeForce GPUs by cryptocurrency miners in Russia in 2017 and the first half of 2018. These allegations do not establish the falsity of Defendants' statements or corroborate Prysm's revenue estimates. That cryptocurrency miners purchased gaming GPUs in 2016 and 2017 does not reveal fraud—it is the reason NVIDIA executives publicly expressed for launching the Crypto SKU in the first place. The relevant question is not whether Plaintiffs have plausibly alleged that cryptocurrency miners purchased large quantities of GeForce GPUs before or during the class period. The relevant question is whether Plaintiffs have alleged with particularity facts demonstrating that Defendants misrepresented cryptocurrency-related sales *after* the launch of the Crypto SKU in May 2017. The FE allegations do not address the impact of the Crypto SKU on mining demand or

demonstrate how any challenged statement directly contradicted what Defendants knew at the time. Accordingly, I would conclude that the FAC does not adequately allege that Defendants' statements were false or misleading.

III. SCIENTER

Plaintiffs have also failed to adequately plead the element of scienter, an independent basis for affirming the district court's dismissal of the FAC. Under the PSLRA, a plaintiff must "state with particularity facts giving rise to a strong inference that the defendant acted with the required state of mind." 15 U.S.C. § 78u-4(b)(2)(A). To demonstrate that the defendant acted with the required state of mind, a complaint must "allege that the defendants made false or misleading statements either intentionally or with deliberate recklessness." *Zucco Partners, LLC v. Digimarc Corp.*, 552 F.3d 981, 991 (9th Cir. 2009) (quoting *Daou Sys.*, 411 F.3d at 1015). "[D]eliberate recklessness" is more than "*mere* recklessness or a motive to commit fraud." *Schueneman v. Arena Pharms., Inc.*, 840 F.3d 698, 705 (9th Cir. 2016) (quoting *Zucco*, 552 F.3d at 991). Rather, it involves "an *extreme* departure from the standards of ordinary care," which "presents a danger of misleading buyers or sellers that is either known to the defendant or is so obvious that the actor must have been aware of it." *Id.* (quoting *Zucco*, 552 F.3d at 991). A securities fraud complaint will survive dismissal "only if a reasonable person would deem the inference of scienter cogent and as least as compelling as any opposing inference one could draw from the facts alleged." *Tellabs, Inc. v. Makor Issues & Rts., Ltd.*, 551 U.S. 308, 324 (2007).

We have held allegations of scienter adequately pled in cases where the complaint alleged the existence of specific internal information, specific access to that information by the relevant principles, and specific public statements that directly contradict the internal information accessed by the defendants. *See, e.g.*, *Oracle*, 380 F.3d at 1231; *In re Quality Sys., Inc. Sec. Litig.*, 865 F.3d 1130, 1145 (9th Cir. 2017); *Glazer*, 63 F.4th at 772.

In *Oracle*, for example, plaintiffs alleged "hard numbers and ma[d]e specific allegations regarding large portions of Oracle's sales data," "the top executives admit[ted] to having monitored the database," and Oracle's CEO admitted he was "heavily involved in an awful lot of th[e] deals" that fell through in the third quarter, even as Oracle executives were making optimistic assessments to the public. 380 F.3d at 1231, 1232–33. In *Quality Systems*, we concluded that "statements by confidential witnesses establish[ed] that members of executive-level management, including individual defendants, had access to and used reports documenting in real time the decline in sales during the [c]lass [p]eriod." 865 F.3d at 1145. In both cases, plaintiffs also alleged that corporate insiders sold large quantities of their stock holdings shortly before the public release of negative information, giving rise to a "strong inference" that those defendants were aware of specific internal information that contradicted their optimistic public statements concerning future sales. *Id.* at 1146; *Oracle*, 380 F.3d at 1232; *see also In re Silicon Graphics Inc. Sec. Litig.*, 183 F.3d 970 (9th Cir. 1999), *as amended* (Aug. 4, 1999), *superseded by statute on other grounds as recognized in Quality Sys.*, 856 F.3d at 1146.

More recently, we concluded in *Glazer* that plaintiffs adequately alleged scienter based on particularized

allegations that a cybersecurity company was struggling to meet sales targets and sales representatives "were pressured by senior executives to identify numerous seven-figure deals as 'committed' when, in fact, the buyers had no interest." 63 F.4th at 769, 772. Plaintiffs' complaint included statements from twenty confidential witnesses, several of whom gave firsthand accounts of company executives pressuring them to characterize illusory deals as "committed" so that these deals would be reflected in revenue forecasts. *Id.* at 772. Plaintiffs also alleged that defendants had access to information about the sales pipeline through an internal reporting system that provided specific information about "deals valued at $500,000 or more, . . . the status of negotiations, the steps remaining to close a deal, and the expected dollar amount for each deal." *Id.* at 773. Plaintiffs alleged that defendants also had access to a revenue platform that "contained real-time information on a company-wide level that would allow [defendants] to learn when the company was short on its pipeline, identify deals that were at risk, and predict outcomes early in the quarter." *Id.* We concluded that plaintiffs' particularized allegations about the contents of these internal reports, which contradicted specific public statements made by defendants, were sufficient to support a strong inference of scienter. *Id.*

As discussed below, Plaintiffs' allegations fail to raise a strong inference of scienter against Huang.[7] I review first the individual allegations of scienter followed by a holistic review of the amended complaint.

[7] The majority concludes that the FAC adequately alleges scienter against Huang but does not do so with respect to Kress. I agree with the majority's determination concerning Kress and therefore confine my analysis to the FAC's allegations relevant to Huang's scienter.

A. Individual Allegations of Scienter against Huang

Plaintiffs allege that internal data showed cryptocurrency miners purchasing significantly more GeForce GPUs than Crypto SKUs over the class period—approximately $1.35 billion more, according to Prysm—which contradicted Huang's public statements about the size of cryptocurrency-related revenues. Plaintiffs further allege that Huang had access to this information through various sources: a centralized sales database, quarterly sales meetings, daily "Top 5" emails, and GeForce Experience data. I address each alleged source of conflicting information in turn.

i. Centralized Database

According to Plaintiffs, "Huang maintained access to a centralized internal sales database that consolidated GeForce sales data from around the world and identified GeForce sales to crypto-miners." Plaintiffs base their allegations concerning the centralized database primarily on the assertions of FE 1, a senior accounts manager in China who left NVIDIA before the class period concluded. FE 1 stated that NVIDIA tracks the sales of GPUs to device manufacturers and to downstream consumers who purchase the manufacturers' completed products. FE 1 explained that regional managers compiled this "sellout" data and entered it into NVIDIA's global sales database, and since 2016, the sellout data expressly identified purchases by cryptocurrency miners. FE 1 also stated that Huang and Kress "had actual access to this data."

Where scienter allegations rely on the statements of confidential witnesses, the complaint "must pass two hurdles to satisfy the PSLRA pleading requirements." *Zucco*, 552 F.3d at 995. "First, the confidential witnesses whose

statements are introduced to establish scienter must be described with sufficient particularity to establish their reliability and personal knowledge. Second, those statements which are reported by confidential witnesses with sufficient reliability and personal knowledge must themselves be indicative of scienter." *Id.* (citations omitted). Plaintiffs' allegations concerning FE 1 do not meet the requirements for particularity and reliability required under the PSLRA.

As an initial matter, FE 1's assertions fail to match what Plaintiffs allege. Nowhere does FE 1 assert that the numbers he reported from China showed that most GeForce GPUs were sold to cryptocurrency miners. Indeed, FE 1 was part of a team tasked with preparing the internal study which analyzed estimated sales of GeForce GPUs to cryptocurrency miners in China. As previously discussed, Figure F from the study reflects that within months of the launch of the Crypto SKU, a large majority (73%) of sales to cryptocurrency miners was serviced by the Crypto SKU rather than by GeForce GPU sales. *See supra* 57–58. This data aligns with Huang's public statements in August and September 2017 that a large majority of cryptocurrency demand was being met by the Crypto SKU. FE 1's statements do not contradict Figure F's results or show how any challenged statement contradicted what Huang knew at the time. Finally, FE 1 does not allege that the centralized sales database showed $1.35 billion more in global GeForce GPU sales from cryptocurrency miners than was reported by NVIDIA executives.

FE 1's statements reveal a more fundamental deficit: the FAC does not allege that FE 1 ever personally accessed the global sales database or had any reliable basis to know its contents. Rather, FE 1 states that the sellout data he

submitted was curated by others at the regional level, and then again at the global level. At best, FE 1 had firsthand knowledge of the raw data being fed into NVIDIA's centralized sales database from one subregion of the company's global market. Contrast that with *Oracle*, where multiple witnesses alleged with particularity the finalized "hard numbers" reported in the actual database. 380 F.3d at 1231.

Because FE 1 lacks personal knowledge of what the global database showed, Plaintiffs' broad assertion that NVIDIA tracks global GeForce GPU sales to end users with precision is not supported by particularized factual allegations. NVIDIA executives knew that sales of Crypto SKUs could only come from cryptocurrency miners because the graphics functionality had been removed from those cards, rendering them useless for gaming. Whether NVIDIA could distinguish downstream GPU gamers or miners with the same precision is a different matter, and NVIDIA executives noted several times that it was "difficult to quantify" what portion of cryptocurrency-mining demand was met by GeForce GPU sales. Plaintiffs have not presented any witness who personally accessed the global sales database after the launch of the Crypto SKU and can describe the contents of the database in sufficient detail to support the allegation that Huang knowingly or recklessly misrepresented cryptocurrency revenues earned in the Gaming segment.

Finally, Plaintiffs' scienter allegations require Plaintiffs to plead with particularity that Huang actually accessed this contrary information at the time of his allegedly false or misleading statements. FE 1 was five levels removed from Huang and never interacted with him. The FAC does not establish that FE 1 was in a position to know whether Huang

accessed the central database. Confidential witnesses who lack personal knowledge cannot impart the particularity and plausibility needed for a securities-fraud complaint. *Quality Sys.*, 865 F.3d at 1144–45.

The only other witness who discussed Huang's use of this database was FE 2, a senior products director who left NVIDIA at the start of the class period. Although FE 2 states that he met with Huang monthly, FE 2 did not personally see Huang access the sales database. Rather, FE 2 states he saw a "training video" *recorded before the class period* that showed Huang "looking at the sales data." This bare assertion falls far short of plausibly alleging that Huang "had access to and used" information regarding cryptocurrency-mining revenues that conflicted with his public statements. *Id.* at 1145.

FE 2's other allegations concerning the database also fall short of the PSLRA's particularity and reliability requirements. FE 2 does not state that he personally accessed the global sales database, nor does he specifically describe the contents of that database. And because FE 2 left NVIDIA before the launch of the Crypto SKU, he was not in a position to know what sales or revenue information was contained in the centralized database following the introduction of the Crypto SKU.[8]

[8] The majority contends that Plaintiffs do rely on internal revenue information other than Prysm's estimates—and point to *Defendants*' own challenged public statements about cryptocurrency revenues. *See* Majority Op. at 43. To state the obvious, Defendants' own revenue statements do not establish their falsity nor raise a strong inference that Defendants knew these statements were false when made. The majority also claims that "[o]ther revenue information comes from witnesses FE 1 and FE 4." There is simply no support for this assertion in the record.

ii. Quarterly Sales Meetings

FE 1 describes quarterly sales meetings attended by Huang in which mining-related sales were discussed. However, FE 1 never participated in any of those quarterly meetings. He contends that emails were circulated from his department before the meetings, but he does not describe with particularity the content of any email or the substance of any information allegedly shared at the quarterly meetings. FE 1's statements lack the personal knowledge and specificity required to establish that Huang had access to information that contradicted his public statements. *See id*.

FE 2 alleges he attended two meetings with Huang in which Huang discussed the effect of cryptocurrency-related demand on GeForce GPU sales and cryptocurrency miners' preference for GeForce GPUs. FE 2 states that Huang "reviewed everyone's sales data in detail at these meetings," and described him as a "micromanager." These statements are not "indicative of scienter." *Zucco*, 552 F.3d at 995. Huang and Kress publicly stated that the company introduced the Crypto SKU in response to strong cryptocurrency-mining demand for gaming GPUs. *See supra* pp. 55–62. Both also acknowledged during the class period that cryptocurrency-mining demand continued to affect sales of both GeForce GPUs and Crypto SKUs. For Plaintiffs to demonstrate a *strong* inference of scienter, the FAC must adequately allege that information Huang received at the quarterly meetings contradicted his public

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The FE witnesses do not disclose any revenue information contained in the global sales database, much less whether GeForce GPU sales were capturing the bulk of cryptocurrency revenues after the launch of the Crypto SKU.

statements. Because FE 2 left the company at the start of the class period, he has no direct personal knowledge about the impact of the Crypto SKU on cryptocurrency-mining demand or global GPU sales. Said another way, FE 2 cannot reliably assert that Huang was privy to information about cryptocurrency-related revenues that conflicted with public statements Huang made *after* FE 2 left the company.

iii. Daily Top 5 Emails

The FAC alleges that senior sales and marketing personnel circulated weekly "Top 5" emails sharing key achievements, challenges, market conditions, and ongoing trends. FE 2 asserted he was on the Top 5 email distribution list. FE 2 says Huang "made a point of telling employees that he had 'super user' status in NVIDA's IT system and would use it to review all the Top 5 emails." Even if FE 2's allegations are sufficient to establish that Huang received these emails, the allegations do not describe any particular email that contradicted Huang's public statements.

iv. GeForce Experience Data

The "GeForce Experience" is opt-in software bundled with GeForce GPUs to help optimize GPUs for gaming activity. FE 1 stated that the software enabled NVIDIA "to monitor usage of GeForce GPUs and informed it whether those GPUs were used for gaming or mining." This statement is conclusory and is not supported with a description of how the GeForce Experience software works or how NVIDIA was able to distinguish between mining and gaming end users. For example, the FAC does not allege how frequently cryptocurrency miners "opted in" to a software which is intended to enhance a gaming experience. Nor does FE 1 profess to know whether Huang ever accessed the GeForce Experience data himself. The FAC does not

provide the requisite particularity to establish that these statements are based on personal knowledge or are sufficiently reliable. *See Zucco*, 552 F.3d at 996.

B. Holistic Review of Scienter Allegations

Although none of the FAC's allegations of scienter is individually cogent or compelling enough to survive under the PSLRA, we must also review the complaint as a whole to determine if a "reasonable person would deem the inference of scienter cogent and at least as compelling as any opposing inference one could draw from the facts alleged." *Tellabs*, 551 U.S. at 324; *see Zucco*, 552 F.3d at 991.

Plaintiffs' core theory of fraud is that Defendants knew but intentionally concealed the extent to which downstream cryptocurrency miners were purchasing GeForce GPUs over the proposed class period. According to Plaintiffs, "[l]aunching the Crypto SKU and reporting its sales in the OEM segment . . . allowed Defendants to claim that any mining-related revenues were cordoned off in OEM, creating the impression that NVIDIA's crown jewel Gaming business was insulated from cryptocurrency volatility (and the crash in demand that would follow the cryptocurrency markets' inevitable bust)." Plaintiffs' scienter allegations suffer from "an immediate first-level problem": their theory of fraud "does not make a whole lot of sense." *Nguyen v. Endologix, Inc.*, 962 F.3d 405, 415 (9th Cir. 2020). Why would Defendants launch the Crypto SKU to conceal the extent to which the company's GeForce GPU revenues were dependent on cryptocurrency mining volatility if the crash in demand was "inevitable?"

The far more plausible inference is what NVIDIA executives disclosed to investors throughout the class period. NVIDIA designed and introduced the Crypto SKU

to address cryptocurrency-mining demand while seeking to protect supplies of GeForce GPUs for its gaming end users. Separating these product lines gave investors and the company greater visibility into cryptocurrency-related revenues, not less. As the price of Ethereum surged in late 2017, Defendants acknowledged that mining demand continued to drive sales in both GeForce GPUs and Crypto SKUs, though it was difficult for the company to quantify the impact on GeForce GPU sales. Surging demand also raised the price and limited the availability of GeForce GPUs for downstream gamers, and NVIDIA responded by increasing the supply of GeForce GPUs. Even if cryptocurrency-mining demand drove more sales of GeForce GPUs than Huang appreciated, such a miscalculation, without more, does not create a claim for securities fraud. It is far more plausible that NVIDIA executives introduced the Crypto SKU and adjusted channel inventory to address volatile cryptocurrency-mining demand than it is to infer that Defendants took elaborate steps to disguise the extent to which NVIDIA's Gaming segment revenues were dependent on cryptocurrency-mining demand, knowing that a crash was "inevitable." I would hold that the district court did not err in dismissing Plaintiffs' FAC for failure to sufficiently allege scienter under the PSLRA.[9]

[9] Section 20(a) of the Securities Exchange Act of 1934 makes certain "controlling" individuals also liable for violations of section 10(b). Pub. L. No. 73-291, 48 Stat. 899 (codified as amended at 15 U.S.C. § 78t(a)); *accord Zucco*, 552 F.3d at 990. As discussed above, Plaintiffs have failed to adequately plead a primary violation of the Securities Exchange Act. I would therefore find that Plaintiffs' Section 20(a) claims fail as well. *See Zucco*, 552 F.3d at 990.