ANTICIPATED ACQUISITION BY

NVIDIA CORPORATION

OF

ARM LIMITED

ME/6906/20

INITIAL SUBMISSION

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20 December 2021

1.   INTRODUCTION

This submission concerns the anticipated acquisition by NVIDIA Corporation ("**NVIDIA**") of the Intellectual Property Group of Arm Limited ("**Arm**") from SoftBank Group (the "**Transaction**") and provides the Parties' response to the report of the Competition and Markets Authority ("**CMA**"), dated 20 July 2021, and the decision of the Secretary of State, dated 16 November 2021 (the "**Decision**"). NVIDIA and Arm are together referred to as the **Parties** in this submission and, for statements referring to the future, as the **Merged Entity**.

A.   With SoftBank's investment phase at an end, Arm is at a crossroads.

The vision of Arm that the Decision describes—an entity that ignores its profit motive and has no competition—is a mirage.

Arm is a private for-profit business at a crossroads. After acquiring Arm several years ago, SoftBank increased Arm's headcount, hoping to spur long-term growth in several markets, including datacenter and personal computer ("**PC**"), long dominated by Intel and x86. SoftBank's investment phase has concluded, and one way or another, SoftBank intends to exit Arm.

Regulators worldwide have been considering two different outcomes for Arm: (i) acquired by NVIDIA, subject to legally binding commitments to expand Arm's R&D across the board and license Arm IP to all without bias or discrimination, or (ii) a profit-maximizing IP licensing firm, with no other profit generators, no specific legal restrictions on its licensing practices, and perhaps most importantly to NVIDIA and other licensees, no binding and enforceable assurance that Arm will invest in any market or product.

B.   An IPO would pressure Arm to narrow its focus and limit investments.

In the media, deal opponents urge the CMA to block the deal so that Arm can pursue an initial public offering ("**IPO**"), which they assume would be launched in the UK on the London Stock Exchange. They equate Arm's popularity with a high market valuation and success, but the public markets are unsentimental. The capital markets demand profitability and performance.

SoftBank considered and rejected an IPO in 2019 and again in early 2020 because the markets would not give SoftBank the necessary return on its investment.[1] While Arm's licensees such as Apple, Qualcomm, and Amazon have enjoyed skyrocketing revenue growth and profits, as well as soaring market valuations, Arm has lately endured comparably flat revenues, rising costs, and lower profits that would likely present challenges for a 30-year old public company. The capital markets would expect Arm to make significant strategic changes, including cutting costs to maximize Arm's value.

As Arm's CEO, Simon Segars, explained: "*We contemplated an IPO but determined that the pressure to deliver short-term revenue growth and profitability would suffocate our ability to invest, expand, move fast and innovate.*"[2]

As a standalone business, Arm faces significant challenges to growth.

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[1]   See response to question 1 of EC RFI 13 of 18 May 2021. See also SB-CMA-00020864_0001.

[2]   https://www.arm.com/blogs/blueprint/arm-nvidia.

Arm's original market, and the largest source of its revenue, mobile, is saturated.

Datacenter and PC, two markets that SoftBank targeted with its investments in Arm, are far more difficult to crack. Unlike Arm, the x86 incumbents in datacenter and PC (Intel and AMD) benefit from an established ecosystem of developers, software, systems, and peripherals. They are also vertically integrated, enjoying profits generated from multiple levels of the technology stack, allowing them to make massive R&D investments. As a result, any competitor following an IP-only licensing model, like Arm, is at a major ecosystem and economic disadvantage.

In addition, Arm does not have the systems building expertise, the software engineering scale, or the R&D resources of x86 vendors like Intel and AMD. Even under the most optimistic projections, standalone Arm could not generate the revenue necessary to invest and compete toe-to-toe with the entrenched x86 incumbents.

To date, Arm has only managed to achieve limited inroads in datacenter, mainly licensing to Amazon, which makes custom chips for its own use, and start-up Ampere Computing, the only entity that offers merchant Arm central processing units ("**CPUs**") for datacenter.

In the PC market, Arm's designs do not have significant market penetration, and Arm's two high-profile PC customers, [✂], have publicly stated that they will ***not*** use Arm's cores for their next-generation PC SoCs—they will create and rely on their own designs.

Standalone Arm would face pressure to narrow its investments and enhance profitability.

These observations are not criticisms of Arm's technology or engineering team. Arm has great engineering talent in the areas where it focuses. But as a standalone IP licensing business, and without access to further capital, Arm has inherent scale, scope, and economic limitations that would impact Arm's future as a standalone licensing firm.

As a publicly traded company, Arm would likely not have the financial resources to invest sufficiently in early stage revenue businesses. NVIDIA is particularly concerned that these pressures would drive Arm to deprioritize datacenter and PC and to instead focus on its core mobile and growing IoT businesses. The result would be a concentrated CPU market largely controlled by Intel/AMD (x86), with the remainder controlled by powerful and far more profitable Arm architectural licensees such as [✂].

Deal opponents argue that so long as Arm remains "independent", Arm should take pride and comfort in the success of its customers. But soaring profits for Intel, Apple, Qualcomm, and Amazon have not manifested as a "win" for Arm, or for competition in general. The industry titans will be powerful and competitive, no matter what path Arm takes. The question at hand is whether regulators will approve the Transaction and allow Arm to take the steps needed to enable others to compete.

C.   **The Transaction represents a unique, once-in-a-generation opportunity to expand and enhance Arm's ecosystem, benefitting the UK and all Arm licensees.**

NVIDIA did not approach SoftBank to buy Arm. NVIDIA is a strong supporter of the x86 ecosystem and has developed accelerated computing platforms for x86 PCs and datacenters throughout its history. Intel and AMD make industry-leading CPUs and SoCs suitable for many industries and products, including NVIDIA's own DGX systems and supercomputers such as Cambridge-1.

Regardless of the Transaction, NVIDIA will continue to support x86 and work with Intel, AMD, and others in the x86 ecosystem. The x86 platform will always be important to the industry, and NVIDIA is committed to support it for the long haul. For example, NVIDIA is developing its Omniverse platform—the foundation for the next generation, 3D worldwide web—on x86 systems. Ideally, however, the industry would have other options as well.

Along with its long-term support for x86, NVIDIA has been an Arm licensee for many years.

When SoftBank approached NVIDIA with the possibility to buy Arm, the Parties realized that NVIDIA would be uniquely suited to help Arm create new IP and develop a world-class ecosystem that could stand as an alternative to x86, giving customers more choice and growing markets worldwide. A viable alternative ecosystem would spur growth and demand for NVIDIA's platforms. It would encourage the x86 giants to innovate and expand their offerings as well, benefitting NVIDIA.

Arm's limitations as a standalone, IP-licensing only entity, have become apparent over many years. Arm licensees, including Broadcom, Qualcomm and more recently Marvell, have tried and failed to penetrate datacenter and PC. As mere licensees, they were neither able to direct Arm to make the necessary investment in datacenter and PC CPU, nor able to infuse Arm with the ecosystem-building expertise it needs.

The Transaction would materially change Arm's incentives and opportunities. In contrast to a standalone Arm, the Merged Entity would have every incentive, and the ability, to dramatically increase investment in Arm R&D across the board, rather than facing the difficult choices of where to de-invest and face further customer and competitive pressures.

After signing the Share Purchase Agreement, in public statements and binding offers to the UK government, NVIDIA committed to expand Arm's engineering teams in the UK, adding a new UK-based group dedicated to creating purpose-built CPU IP for datacenter and PCs. The enhanced investment in the UK, combined with NVIDIA's technological expertise, would accelerate Arm's product development and the Arm roadmap, allowing Arm to expand its reach into areas that it underserves today.

NVIDIA would also bring its expertise in SoC design, software, accelerators, and system designs to attract software, hardware and system developers to the Arm datacenter ecosystem. NVIDIA would port its platform solutions to Arm, and help developers optimize code for Arm-based accelerated systems.

Thus, the Transaction represents a unique, once-in-a-generation opportunity to expand and enhance Arm's ecosystem in critical markets. NVIDIA's investments in Arm and the UK would deconcentrate CPU markets long dominated by Intel's x86 CPUs, while accelerating Arm's roadmaps for mobile, IoT, and other areas Arm has traditionally served.

Given the strong competition Arm faces from Intel and AMD in every relevant antitrust market and NVIDIA's commitment to maintain Arm's open licensing model, the Parties did not foresee any insurmountable objection to the Transaction.

The Parties' businesses are highly complementary and relate to different levels of the semiconductor value chain. Arm primarily licenses CPU IP for low-power mobile devices, a sector in which NVIDIA is not active.

NVIDIA designs and supplies accelerated computing platforms, including graphics processing units ("**GPUs**"), for high-end gaming PCs[3] and datacenters. NVIDIA supplies its products to PC or server original equipment manufacturers ("**OEMs**").

Today, NVIDIA is best known for its industry-leading AI-enabled platforms and systems, including the "Cambridge-1" supercomputer NVIDIA built at its own expense and launched in the UK for medical research. (Reflecting Arm's minimal position in the datacenter market, NVIDIA purchased AMD x86 CPUs for the Cambridge-1 supercomputer—no suitable Arm CPU was available.) NVIDIA's investments in AI-related technologies have soared in recent years; most recently, in addition to developing Omniverse on x86 platforms, NVIDIA announced plans to develop "Earth-2": the world's largest and most powerful supercomputer, which will be dedicated to climate science.

In the few areas where NVIDIA uses Arm's CPU IP—primarily datacenter CPUs, SmartNICs (sometimes referred to as "data processing units" or **DPUs**), and autonomous vehicle SoCs—NVIDIA's competitors have numerous alternatives and are not at risk of foreclosure. And NVIDIA is not a potential competitor to Arm in any market. NVIDIA does not license its IP to others and absent the Transaction, has no plans to do so.

D.   **While NVIDIA and Arm engage with regulators, Arm's competition has been exploiting the delay and moving fast.**

NVIDIA, SoftBank, and Arm have been working with regulators at the CMA and worldwide for over a year, explaining how the Transaction will create new opportunities and new alternatives to the dominant x86 platform. Several leading Arm licensees (MediaTek, Broadcom, Marvell) expressed their support for the Transaction, but Intel and Qualcomm, which compete against Arm's own engineering teams and designs, have not.

In the meantime, Intel, Qualcomm, and Arm's other competitors continue to expand their offerings, exploiting the uncertainty surrounding Arm's future.

(i)   *Intel's x86 licensing program is a direct challenge to Arm.*

In March 2021, several months after NVIDIA and SoftBank announced the Transaction, Intel made its countermove, announcing that it will license its dominant x86 CPU IP to chip designers as part of its "foundry services" ("**Intel IFS**").

Intel heralded IFS as a "*meaningful shift in how people think about Arm versus x86.*"[4] IFS will leverage the power of "*a trillion lines of code that have been optimized for the x86*" ecosystem.[5]

Moving rapidly out of the gate, Intel is already competing head-to-head with Arm to supply CPU IP for important customers, targeting cloud service providers. Intel's CEO Pat Gelsinger recently noted "*a lot of interest*" from a wide range of customers, including

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[3]   High-end gaming PCs are PCs equipped with high-performance discrete GPUs.

[4]   Intel CEO says co-designed x86 chips will fend off Arm threat, PC Gamer (Apr. 23, 2021), available at https://www.pcgamer.com/intel-x86-vs-arm-gelsinger/.

[5]   Ibid.

interests that include "*embedded-like use cases up to HPC use-cases with data center and cloud customers somewhat in the middle of those*."[6]

Intel and Qualcomm quickly partnered on IFS, and, according to Intel's CEO, Qualcomm is "*driving [Intel] to do a more aggressive optimization for power/performance than [its] more performance-centric product lines would be*".[7]

IFS is a strong challenge to Arm's efforts in the datacenter and PC markets. Customization was Arm's greatest selling point in the datacenter, as Arm does not have the mature ecosystem or massive R&D resources that Intel can bring to bear. Now Arm's handful of datacenter customers can create custom x86 CPUs that will benefit from the massive x86 code base.

Every Arm customer—including NVIDIA—will now have IFS as a viable option, allowing chip designers to use x86 for every new product generation and line.

For Arm, investing in datacenter and PC has become a high-risk investment.

> (ii) **RISC-V's momentum is accelerating.**

The RISC-V community is also exploiting the regulatory delay and uncertainty. The past year saw a flurry of activity in RISC-V, a threat to Arm in automotive, IoT, and SmartNICs.

In June 2021, for example, SiFive announced its "P550" high-performance CPU IP based on RISC-V, which compares favorably to Arm's contemporary CPU IP block (Cortex-A75), in a smaller package.[8] In December 2021, SiFive announced that its next-generation microarchitecture (available in 2022), the "P650," which targets "high-end servers and other applications requiring large arrays of multiple processor cores."[9]

Meanwhile, in August 2021, Esperanto introduced a "supercomputer-on-a-chip" AI accelerator that uses more than 1,000 CPU cores based on RISC-V.[10] RISC-V vendor Imagination Technologies announced its roadmap for a full line of RISC-V processors, including CPU IP targeting server and autonomous driving applications.[11] Imagination and other RISC-V vendors have a strong incentive not only to compete in the marketplace, but also to [✂]. Established vendors are using more and more RISC-V in their offerings—

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[6]   Intel's Pat Gelsinger on Super Moore's Law Making Multi-Billion Dollar Bets, Tom's Hardware (Oct. 28, 2021), available at https://www.tomshardware.com/news/intels-pat-gelsinger-on-super-moores-law-making-multi-billion-dollar-bets.

[7]   Bringing Geek Back: Q&A with Intel CEO Pat Gelsinger, Anandtech (Oct. 29, 2021), available at https://www.anandtech.com/show/17042/bringing-geek-back-qa-with-intel-ceo-pat-gelsinger.

[8]   https://www.sifive.com/press/sifive-performance-p550-core-sets-new-standard-as-highest.

[9]   "SiFive Unveils 64-Bit RISC-V Server Core," EE Times (Dec. 2, 2021), available at https://www.eetimes.com/sifive-unveils-64-bit-risc-v-server-core/#; "SiFive Envisions 128-Core RISC-V SoCs as Gap With x86 and Arm Closes," Tom's Hardware (Oct. 22, 2021), available at https://www.tomshardware.com/news/sifive-develops-ultra-high-performance-risc-v-core.

[10]   https://www.esperanto.ai/esperanto-technologies-unveils-energy-efficient-risc-v-based-machine-learning-accelerator-chip-at-hot-chips-33-conference/.

[11]   "Imagination Technologies unveils Catapult RISC-V CPU family," VentureBeat (Dec. 6, 2021), available at https://venturebeat.com/2021/12/06/imagination-technologies-unveils-catapult-risc-v-cpu-family/.

Renesas is partnering with SiFive to develop jointly next-generation automotive solutions,[12] Intel is deploying RISC-V in certain FPGAs,[13] and Alibaba has released open-source RISC-V processor designs.[14]

E. **Arm's architectural licensees, including Qualcomm, are competing with (and recruiting from) Arm's implementation IP teams.**

The Decision erroneously presumes that architectural licensees such as Apple and Qualcomm demonstrate Arm's success. But the architectural licensees do *not* use Arm's CPU designs. Arm architectural licensees create their *own* proprietary CPU designs using their *own* engineering teams in the United States.

As a result, these architectural licensees *compete* with Arm's own engineers. Their success will *concentrate* the market, because they do *not* license their designs to anyone else. Apple's industry leading M1 processor, for example, was designed entirely by Apple, not Arm. It is captive and available only to Apple.

Arm's architectural licensees, such as Qualcomm, compete head-to-head with the licensees that use Arm's own CPU designs, such as MediaTek. As a result, those architectural licensees would *benefit* from less competitive Arm designs. They would benefit from reduced investment in Arm's own engineering teams. They would also *benefit* if Arm was forced to remain standalone and had to scale back on its R&D to please the public markets. It is no coincidence that the industry's most prominent architectural licensee, Qualcomm, is the party most publicly opposed to the Transaction. The Decision implies that Ampere Computing, another architectural licensee, is against the Transaction as well. MediaTek, Broadcom, and Marvell, all implementation licensees who want Arm's engineering teams to be strong and would benefit from the increased R&D that NVIDIA will provide, support the Transaction.

Since the Parties entered into the Transaction, Arm's architectural licensees have doubled down, seeking to maintain their advantage over Arm's own engineering teams and other downstream customers. Qualcomm, for example, paid $1.4 billion to acquire NUVIA's CPU design team (comprised of Arm and Apple alumni) and create a proprietary CPU that Qualcomm will keep for itself.[15]

The Decision appears to be confused by the fact that architectural licensees pay fees to Arm. Those fees compensate Arm for any copyrights and patents embodied in the Arm ISA, as well as verification collateral. But the architectural licensees do *not* use Arm's designs.

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[12]   Renesas and SiFive Partner to Jointly-Develop Next-Generation High-End RISC-V Solutions for Automotive Applications (April 21, 2021), available at <https://www.renesas.com/eu/en/about/press-room/renesas-and-sifive-partner-jointly-develop-next-generation-high-end-risc-v-solutions-automotive>.

[13]   Nios V Processors, Intel, available at https://www.intel.com/content/www/us/en/products/details/fpga/nios-processor/v.html.

[14]   Alibaba's new 16-core CPU will challenge Intel Xeon in datacenters, TechRadar (August 28, 2020), available at https://www.techradar.com/uk/news/alibabas-new-16-core-cpu-will-challenge-intel-xeon-in-datacenters.

[15]   Qualcomm's new CEO eyes dominance in the laptop markets, Reuters (July 2, 2021), available at https://www.reuters.com/technology/qualcomms-new-ceo-eyes-dominance-laptop-markets-2021-07-01/.

As a result, the architectural licensees pose a threat to Arm's implementation IP business. When architectural licensees create implementations that are more advanced or powerful than Arm's own, innovation and competition suffer. Arm ultimately will find it increasingly difficult to fund its own engineering teams to create implementation IP for its implementation licensees who need that IP to compete against the architectural licensees. Instead, Arm could be pressured to further cut back on investment to drive profitability, while Apple and Qualcomm create their proprietary designs and chips for the downstream markets, which cannot be sublicensed to other companies.

This is not a theoretical risk. Arm's architectural licensees are among the most profitable technology companies in the world, larger and far better funded than Arm. The architectural licensees also have the means and incentive to challenge Arm for engineering talent, risking a downward spiral—*i.e.*, Arm must pay more to retain its engineers, which increases Arm's costs, which makes Arm less profitable, which discourages Arm from making further investments in its own implementation IP, which makes Arm less competitive with the architectural licensees (and less competitive with x86), and so on.

The Decision fails to grapple with this threat, but Arm cannot ignore it. The existence of architectural licenses creates pressure on Arm to find the funding to increase resources and scale to compete with designs from powerful semiconductor giants with larger R&D budgets.

F.   The Merged Entity would have no ability to foreclose competition.

The Decision contends that Arm has market power, which would allow the Merged Entity to foreclose competition in numerous downstream markets. The Decision's logic and conclusions are flawed.

First, the Decision ignores competition from Intel in every relevant market. Antitrust law preserves ***competition***—it does not empower customers and competitors with veto rights over acquisitions. The Decision appears to lose sight of this fundamental principle, contending instead that if enough high-profile Arm customers object to the deal, the Transaction must be anticompetitive and should be blocked.

But even if some customers and competitors are unhappy with Arm's plans, the Transaction has no risk of ***foreclosing competition***. In datacenter and PC CPUs, for example, the Merged Entity cannot foreclose Intel, which has been the dominant CPU supplier for over 30 years. Downstream customers have several Intel options—Intel not only offers its own CPU designs, but now also licenses x86 IP for third parties to make their own custom CPU and SoC designs.

The Decision disparages Intel, AMD, and hundreds of RISC-V supporters as forever unable to compete with Arm. No industry observer can seriously contend that Intel, AMD, and Arm's other competitors are so incapable that they cannot even ***compete*** with Arm. Intel and AMD are the industry leaders, not also-rans. NVIDIA has chosen x86 for its DGX and its supercomputers for good reason. Intel and AMD's CPUs are not going anywhere, and they will compete with Arm for the foreseeable future. With or without the Transaction, Arm cannot foreclose competition.

Second, the Decision ignores the power of Arm's long-term licensee contracts (and Arm's powerful architectural licensees), which ensure that the Merged Entity cannot foreclose its licensees ***for many years***, and therefore, cannot foreclose competition. Arm licensees even

have perpetual manufacturing rights, which means that they can forever continue to make, use, and sell chips designed during the license term.

Third, the Decision ignores Arm's history and financials. The past few years have been extraordinary for the semiconductor industry, with unprecedented growth. If the CMA's view of Arm were correct and Arm has "market power" in every market, then Arm should have soaring profits, especially with its largest customers (Apple, Qualcomm, Amazon) achieving unprecedented financial returns. But the record reflects that Arm continues to lag far behind its customers. Only one rational conclusion can be drawn: Arm faces significant competition in every relevant market.

G. The Merged Entity will have no incentive to foreclose.

Even if the Merged Entity ***could*** foreclose competition, it would have no incentive to do so. Rather, the Merged Entity would have every incentive to do exactly what NVIDIA has repeatedly pledged: increase Arm's R&D, grow the ecosystem, and license all existing and prospective customers without discrimination.

The Decision disagrees, suggesting that because NVIDIA makes more money selling its products than Arm makes licensing IP, NVIDIA must have a secret plan to destroy Arm's business, rather than grow it.

The Decision's theory does not hold up to scrutiny. Arm licenses IP for products that will not come to market ***for years***. As a result, any foreclosure strategy cannot possibly benefit NVIDIA's downstream sales ***for years*** (if ever). Yet trying to foreclose Arm licensees would ***immediately*** reduce Arm's licensing revenue, ***immediately*** damaging NVIDIA's investment.

No economically rational, publicly traded entity would embrace such a self-defeating strategy. The Decision fails to offer any rational economic theory or other credible explanation for why, in the face of competition from x86 and RISC-V, the Merged Entity would destroy NVIDIA's multibillion dollar investment in an entirely speculative hope of winning more downstream business many years into the future.

The Decision fails to identify ***any*** evidence—not a single NVIDIA document—suggesting that NVIDIA plans to embark on such a self-defeating foreclosure strategy. To the contrary, the evidence and common sense shows that any foreclosure strategy would not only lead to financial calamity, but as Arm's licensees are also NVIDIA's current customers and suppliers, it also would incur the wrath of NVIDIA's most powerful ecosystem suppliers and customers. The Merged Entity would have no incentive to foreclose.

H. NVIDIA offered legally-binding and easily enforceable guarantees that would give customers and regulators far more assurances and rights than they have today.

Although the Transaction does not give rise to a substantial lessening of competition ("**SLC**") in any market, NVIDIA has been willing to stand by its promises to Arm and its customers from the outset. With that in mind, NVIDIA offered comprehensive guarantees (which Arm does ***not*** provide today, and would ***not*** provide if it went through an IPO) to:

> (i)   Implement an open licensing program, with equal and early access available to all Arm licensees,

(ii)   Expand Arm's R&D in the UK and support Arm's product roadmaps,

(iii)   Promote interoperability and allow Arm customers to determine interoperability as they deem fit, and

(iv)   Protect any confidential Arm customer information.

When deal opponents argued that NVIDIA could still somehow keep the "best" Arm IP for itself, NVIDIA offered additional guarantees, pledging to license *any* CPU IP the Merged Entity creates, including any CPU IP generated by ***NVIDIA's own CPU design teams***. In other words, NVIDIA would give Arm customers such as Intel, Qualcomm, and others a significant advantage. Arm customers could continue to create their own proprietary CPU designs for themselves, but NVIDIA would keep nothing for itself, and offer *every* CPU design to all Arm licensees.

When deal opponents claimed that the law would be powerless to enforce NVIDIA's contractual and regulatory promises, NVIDIA proposed to create a new and independent entity, the Arm Licensing Co. ("**ALC**"), that would be solely responsible for negotiating, licensing, and distributing Arm IP to all interested parties, eliminating any concern about discrimination. The ALC would administer contracts with customers and provide support services, eliminating any concern about confidentiality.

NVIDIA would be a passive minority shareholder but would not control the ALC. By its corporate charter, the ALC would be legally obligated to pursue a single purpose: growing the Arm ecosystem, maximizing the revenue available for Arm R&D, and treating **all** Arm customers fairly, without discrimination or unfair preferential access.

Without the Transaction, Arm would be under no such obligations.

I.   **The Decision ignores Arm's profit motive and erroneously assumes that structural independence guarantees that Arm is (and will remain) "neutral".**

The Decision dismisses all remedies without substantive engagement. Instead, the Decision suggests that (i) Arm's long-term, legally binding contracts will not limit NVIDIA's post-close conduct, and (ii) the CMA and regulators worldwide will be powerless to enforce NVIDIA's binding commitments.

The Decision argues that to protect competition, Arm must be "neutral," and that only Arm's structural independence will guarantee neutrality. The Decision also presumes, without any evidence, that a structurally independent Arm will make investment and roadmap decisions that will promote competition. The Decision's premise and conclusion are flawed.

First, the Decision fails to recognize that while Arm is open, it is ***not*** strictly "neutral" today. To the contrary, the evidence reveals that Arm consistently seeks to maximize its own profits, like any other private business. For example, Arm previously allowed [✂] and select other customers to pay a premium for early access to CPU IP with a performance boost that Arm did not make available to other licensees until later. Arm also operates a limited "Lead Partner" program, with select licensees given priority access to Arm IP, for a fee.

Arm's contract terms, license fees and royalties vary across licensees. Arm gave the world's most powerful entities, [✂], the right to create their own proprietary instructions, allowing them to leverage their market power over their software to chips. Arm made sizable financial

investments in certain customers (*e.g.*, Ampere and Marvell), but not others, and has a greater financial interest in their success.

Second, the Decision does not present any rational economic theory supporting the assumption that Arm's structural independence ensures that it will treat all customers the same. Economic theory holds that as an independent entity, Arm will continue to act in its own profit-maximizing self-interest.

The Decision ignores this inconvenient truth. Where profitable, standalone Arm could continue to favor some licensees over others, grant preferential licensing terms, and benefit its largest and most powerful customers. If an Arm licensee gave Arm a highly profitable offer for exclusive early access, standalone Arm could grant such rights, if it wished. NVIDIA has made a binding, enforceable offer to do no such thing.

Third, the Decision does not present any evidence or economic theory supporting its argument that Arm's structural independence means that it would make investment decisions that would promote downstream competition. Rather, Arm would make investment decisions that benefit standalone Arm, and please its new investors. Where Arm has less to gain from a market (such as datacenter and PC), Arm would be less inclined to invest.

The Decision fails to grapple with this economic reality. A hypothetic standalone post-IPO Arm would have an incentive to cut costs in the UK and worldwide, jettison unprofitable projects, and increase revenues to please its future shareholders. Such cuts would benefit the industry's dominant players, who have little interest in seeing Arm enable others.

The CMA insists that Arm must forever be locked into its current form, and that any "change in incentives" is harmful to competition. The Transaction will change Arm's incentives, but to the ***benefit*** of competition, not to its harm. The Merged Entity will have a far ***greater*** incentive to invest in markets that Arm may otherwise be forced to neglect, an incentive to grow Arm's R&D teams in the UK and elsewhere, and reason to pour resources and technology into a broad effort to grow Arm's ecosystem.

J. The UK's extended review will not benefit Arm or promote competition.

The Transaction is not nearly as complicated as the Decision would suggest. In every relevant market, Arm faces powerful competition that it cannot foreclose, and with that, the CMA's review should have concluded that the Transaction does not give rise to a concern in any market.

Nonetheless, deal opponents urge the CMA to block the Transaction. That outcome may please the world's most powerful and profitable technology companies, but it would not help Arm, drive innovation, or preserve competition. Rather, it will likely lead to less investment in the UK, less resources for Arm, less innovation, and less competition worldwide.

Offering concrete and enforceable guarantees, NVIDIA has pledged to help build an innovative, non-discriminatory Arm that would increase investment in the UK, and create and democratize world leading Arm IP. Over a year has passed since the Transaction was announced, and for Arm, time is of the essence. With Arm's adversaries moving quickly worldwide, and the Decision urging Arm's perpetual "independence", an opportunity for Arm and the UK is slipping away.

2.   DATACENTER CPUs

Citing customer testimonials, the Decision jumps to the conclusion that standalone Arm is finally poised to conquer the datacenter market and relegate Intel, AMD, and x86 to also-ran status. But even Arm's most ardent supporters do not believe that x86 will suddenly disappear from the datacenter market. To the contrary, Arm's most optimistic projections (before Intel launched IFS) did not portend Intel's demise, conceding that Intel will account for a large majority of the datacenter CPU market for the foreseeable future. From an antitrust perspective, that should have been the end of the matter; if Intel cannot be foreclosed, there can be no SLC on the market for datacentre CPUs.

A.   Summary of the Parties' activities

Arm develops and licenses general-purpose CPU IP and does not supply CPUs. **NVIDIA** does not license CPU IP to others, and today, NVIDIA does not currently have a datacenter CPU product.[16]

B.   No ability to foreclose

(i)   *No ability to foreclose Intel (or AMD)*

The Decision notes that Arm's few datacenter customers are happy with Arm, and therefore, declares that Arm has market power that NVIDIA could abuse.

Satisfied customers are not an antitrust market. Arm-based/compatible datacenter CPUs indisputably compete with Intel (and AMD), which dominates the downstream market for datacenter CPUs with x86-based processors (>95% share in terms of volume and value). Arm-based/compatible CPUs account for only [0 - 5]% of the overall market for datacenter CPUs in terms of value in 2020 (and only [0 - 5]% in terms of volume).

In the face of these facts, the Decision claims "*that the importance of x86-based Datacentre CPUs downstream for server OEMs is declining based on Intel's decreasing share of supply*"—pointing to Intel's decline from [90 - 100]% to [80 - 90]% by volume and [90 - 100]% to [90 - 100]% by value between 2018 and 2020.[17] The Decision ignores the obvious explanation—Intel has primarily lost share to AMD (another x86-based supplier), ***not*** to Arm-based designs, which still represent a tiny fraction of the addressable market. As industry expert The Next Platform observed, "*[w]e don't hear of a single big HPC system in the United States that does not have AMD CPUs.*"[18]

The CMA cannot dispute that the x86 ecosystem dwarfs Arm's. The x86 ISA is ubiquitous in datacenters, and has been for decades, leading to the development of an enormous software and developer ecosystem. The x86 ecosystem has "*one trillion lines of code*" optimized for its architecture, creating a compelling reason for customers to choose x86 over Arm.[19] These lines of code support critical software offerings that are directly available on x86 but

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[16]   NVIDIA is currently developing an Arm-compatible datacenter CPU (Grace), intended for a narrow sliver of the datacenter space.

[17]   The Decision, para. 7.37.

[18]   AMD Rides The High Performance Computing Megacycle, The Next Platform (January 26, 2021), available at <https://www.nextplatform.com/2021/01/26/amd-rides-the-high-performance-computing-megacycle/>.

[19]   Transcript of INTC Q1 2021 Earnings Call (April 22, 2021).

unavailable on Arm, including Microsoft's enterprise apps, Salesforce, Adobe, SAP, Oracle ERP, Workday, ServiceNow, and Intuit. The fabric of the 3D worldwide web, powered by NVIDIA's Omniverse, is being developed based *entirely* on x86 systems, not on Arm. The lack of a competitive Arm ecosystem is also corroborated by Broadcom, Qualcomm and Marvell's exit from the general-purpose Arm-based CPU IP datacenter market segment.

Despite this, the Decision attempts to disqualify x86 from consideration on the grounds that Intel is "*proprietary IP or self-supply (including Intel, AMD and IBM), not currently available to third parties*".[20] This curious criticism is misplaced for several reasons.

First, even if "proprietary" IP were not widely available to third parties, CPUs based on that IP still constrain Arm's business. At no point does the CMA suggest that the downstream market can be limited to datacenter CPU suppliers who use only "non-proprietary" CPU IP—and such a distinction would lack any basis in economics or the law.

Second, x86 IP is available to *all* of Arm's customers.[21] Intel is directly targeting Arm's narrow toehold in datacenter, enabling customers to use Intel IP to create custom chips.[22] Arm's highest-profile datacenter customer, Amazon, has already lined up as one of Intel's first IFS customers.[23] Dozens of other customers have already engaged with Intel, which is "*opening the doors*" to Intel IP and causing a "*meaningful shift in how people think about Arm.*"[24]

The Decision dismisses Intel's licensing program, suggesting that downstream customers will shun x86 IP and refuse to collaborate with Intel.[25] Aside from being economically irrational, that would be surprising to Intel and the dozens of customers that have already engaged with it.[26]

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[20]   The Decision, para. 7.26.

[21]   Intel CEO Pat Gelsinger Announces 'IDM 2.0' Strategy for Manufacturing, Innovation and Product Leadership, Intel (March 23, 2021), available at https://www.intel.com/content/www/us/en/newsroom/news/idm-manufacturing-innovation-product-leadership.html#gs.aeohs7; INTC Q1 2020 Earnings Call (Apr. 22, 2021), at p. 18-19.

[22]   Intel: The Empire Strikes Back," Seeking Alpha (May 12, 2021), available at https://seekingalpha.com/article/4427816-intel-the-empire-strikes-back ("Pat Gelsinger certainly wasn't shy about name-dropping potential customers, such as the cloud providers as well as possibly Apple… . [I]f a cloud service provider wanted to take Intel's x86 cores and create their own chips based on these cores, this would be completely possible—in the process effectively sidestepping the Intel client or data center business. **This could hence be seen as an alternative to Arm's Neoverse effort**. Whether this eventually results in x86-based AWS Graviton instances remains to be seen. But it does provide a clear, perhaps even visionary, response to some of the concerns of those players developing their own (Arm-based) silicon, at least in principle" (emphasis added).

[23]   Intel to build Qualcomm chips, aims to catch foundry rivals by 2025, Reuters (July 26, 2021), available at https://www.reuters.com/technology/intel-build-qualcomm-chips-aims-catch-foundry-rivals-by-2025-2021-07-26/.

[24]   INTC Q1 2021 Earnings Call (Apr. 22, 2021), at p. 18-19.

[25]   The Decision, para. 7.37.

[26]   For example, Intel is collaborating with Qualcomm on foundry opportunities. As Mr. Gelsinger explained, "For instance, our engagement with Qualcomm. They're driving us to do a more aggressive optimization for power/performance than our more performance-centric product lines would be, so they're making IDM better by the engagement with IFS customers, standardized PDKs, and other things." See Intel's Pat Gelsinger on Super Moore's Law Making Multi-Billion Dollar Bets, Tom's Hardware

In fact, in a recent interview, Intel's CEO Pat Gelsinger explained why Intel expects to continue to win against Arm in the datacenter:

> *"And when you think about the datacenter space, the role of Arm is very minimal today, and us getting our act together, I think it stays that way. I just don't see that people want to go through all that hard, heavy lifting of changing the software environment for another architecture if there [aren't] major [total cost of ownership] advantages on the table – and there [aren't] if we've done our job well in that respect."*[27]

Over the next few years (before Arm licensee contracts expire) every Arm licensee, including NVIDIA itself, will have an opportunity to consider Intel IFS.

The Decision brushes Intel's progress aside, arguing that Intel's success in datacenter—Intel's core market and a space it has dominated for decades—is simply too uncertain to be given credit as a material competitive constraint. But Intel, not Arm, is the datacenter incumbent, with the attendant advantages. Arm's datacenter CPU IP is not designed from the ground up for the datacenter,[28] and there are multiple examples of Arm-based datacenter CPU suppliers that tried and exited the market, including Qualcomm, Broadcom, and Marvell.[29]

Today's cutting-edge technologies and systems, including NVIDIA's Omniverse and Cambridge-1 supercomputers, are based on x86 CPUs, not Arm. Whatever the CMA may think about Intel and AMD, it cannot dismiss x86 as serious competition for the foreseeable future, and that, alone, defeats any SLC.

(October 28, 2021), available at https://www.tomshardware.com/news/intels-pat-gelsinger-on-super-moores-law-making-multi-billion-dollar-bets. See also Intel: The Empire Strikes Back, Seeking Alpha (May 12, 2021), available at https://seekingalpha.com/article/4427816-intel-the-empire-strikes-back ("Pat Gelsinger certainly wasn't shy about name-dropping potential customers, such as the cloud providers as well as possibly Apple. . . . [I]f a cloud service provider wanted to take Intel's x86 cores and create their own chips based on these cores, this would be completely possible—in the process effectively sidestepping the Intel client or data center business. This could hence be seen as an alternative to Arm's Neoverse effort. Whether this eventually results in x86-based AWS Graviton instances remains to be seen. But it does provide a clear, perhaps even visionary, response to some of the concerns of those players developing their own (Arm-based) silicon, at least in principle."). Intel now identifies Qualcomm as one of its top strategic customers. See Intel Calls Qualcomm A Top Strategic Account In Sales Reorg Memo, CRN, November 10, 2021, available at https://www.crn.com/news/components-peripherals/intel-calls-qualcomm-a-top-strategic-account-in-sales-reorg-memo.

[27] Intel CEO says AMD's time is 'over', PCWorld (October 4, 2021), available at https://www.pcworld.com/article/540875/intel-ceo-says-amds-time-is-over.html.

[28] NVIDIA-CMA-007845211.

[29] Qualcomm's new CEO eyes dominance in the laptop markets, Reuters (July 2, 2021), available at https://www.reuters.com/technology/qualcomms-new-ceo-eyes-dominance-laptop-markets-2021-07-01/ ("Qualcomm has no plans to build its own products to enter the other big market for CPUs—data centers for cloud computing companies."). See Broadcom quietly dismantles its 'Vulcan' ARM server chip project, The Register (December 7, 2016), available at https://www.theregister.com/2016/12/07/broadcom_arm_processor_vulcan/.

(ii)   ***No ability to foreclose RISC-V or other alternatives to Arm***

The Decision also dismisses the looming threat posed by RISC-V, noting that today, third-party datacenter CPU suppliers report that they prefer Arm.[30] The question is not whether Arm's ***existing*** customers prefer Arm ***today***. They obviously selected Arm over RISC-V in the first place. Rather, the question is whether hypothetically, if the Merged Entity were to refuse to license future datacenter IP as soon as it can (***which is many years down the road***), customers could pursue other alternatives ***at that time***. The Decision does not grapple with that question, simply assuming that RISC-V will forever trail Arm, and never be competitive.

Given the long timeframe at issue (customers ***already*** have the IP in their possession, and it will be many years before their contracts are up for renewal) and the significant international effort underway on RISC-V, the CMA cannot presume that RISC-V will fail. RISC-V has two potential advantages over Arm today—it is both less expensive and more customizable than Arm. Even if customers prefer Arm today, RISC-V creates a very real competitive constraint.

The trade press is filled with the steady drumbeat of recent public announcements supporting RISC-V. SiFive announced server-class CPU IP based on RISC-V, available in 2022.[31] At least one vendor has already produced a "demo board" for a high-performance computing server based on SiFive CPU IP.[32] Imagination Technologies has likewise announced a full stack of CPU IP based on RISC-V, specifically targeting the Arm stack of microcontrollers and microprocessors.[33] The RISC-V standard itself has been advanced to support developments in AI and machine learning.[34] Alibaba developed RISC-V CPU chip designs for the datacenter, which they have released on an open-source basis and which they are continuing to develop.[35] SiFive and others also supply chips based on their own CPU designs.

The CMA does not address the critical question: if RISC-V is as uncompetitive as the Decision claims, why are so many industry leaders around the world pursuing it? Sophisticated firms are spending billions of dollars on RISC-V for a reason. RISC-V is a very real competitive constraint, and the CMA cannot ignore it.

(iii)   ***No ability to foreclose architectural licensees***

The Decision also fails to address the impact of Arm's architectural licensees. Arm's architectural licensees, including Apple, Qualcomm/NUVIA, Marvell, Ampere and

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[30]   The Decision, paras. 7.17 to 7.19.

[31]   *See* SiFive Unveils 64-Bit RISC-V Server Core, EETimes (December 2, 2021), available at https://www.eetimes.com/sifive-unveils-64-bit-risc-v-server-core/#.   *see   also* https://www.tomshardware.com/news/sifive-announces-p650-riscv;   *and   see* https://www.cnet.com/tech/mobile/sifives-new-risc-v-chip-challenges-decades-old-computing-designs/.

[32]   *See* https://www.tomshardware.com/news/risc-v-cluster-demonstrated. As this article notes, the demo board being sampled is designed to help other vendors test their software and develop an "ecosystem" around RISC-V CPUs for the datacenter.

[33]   https://www.anandtech.com/show/17104/imagination-launches-catapult-family-of-riscv-cpu-cores.

[34]   https://www.notebookcheck.net/RISC-V-specifications-update-brings-improved-machine-learning-virtualization-and-encryption-instructions.582665.0.html.

[35]   https://www.cnx-software.com/2021/10/20/alibaba-open-source-risc-v-cores-xuantie-e902-e906-c906-and-c910/.

Microsoft, do ***not*** need to rely on Arm's CPU designs. Rather, the architectural licensees have designed their ***own*** CPUs compatible with the Arm ISA.

The Decision fails to recognize that Arm has ***already*** granted all the rights that architectural licensees need to compete. Neither Arm nor the Merged Entity can foreclose Arm's architectural licensees—they do not need anything further to design their own CPUs. For example, **NUVIA** (now owned by Qualcomm) created its ***own*** CPU design to compete with Intel, AMD, and Arm's other licensees. NUVIA's CEO, a former CPU developer at Arm and Apple, explained that NUVIA would not use Arm's "off-the-shelf" IP and emphasized that NUVIA's custom Arm-compatible CPUs will compete with Arm's own IP:

> "*This is a server-class CPU, with an SoC surrounding it, and it is designed to be the clear-cut winner on each of those categories – and in totality,*" *says Carvill, throwing down the gauntlet to all of the remaining CPU players, who each have their own ideas about how to take on Intel's hegemony. "And we are not talking about the incremental performance improvements that we have come to expect over the past five years. We are talking about really meaningful, significant, double-digit performance improvements over what anyone has seen before…. What we are doing is custom, and we will not be using off the shelf, licensed cores. We are going to use an Arm ISA, but we are doing it as a clean sheet architecture from the ground up that is built for the hyperscaler world.*"[36]

Thus, the Merged Entity cannot foreclose Apple, Qualcomm, and others.

(iv) *Arm contracts ensure that the Merged Entity cannot even attempt to foreclose, much less impact downstream markets, for years.*

The Decision presumes that the Merged Entity will be able to deprive Arm customers of Arm IP in the very near future. But Arm cannot "claw back" IP from customers—once a customer has created a chip with the IP it has licensed from Arm, it can use that IP to make as many chips as it wants.

Moreover, Arm licensees receive the right to design Arm-based chips for a long duration, often between 2-7 years, and in some cases much longer. [✂].

Arm licensees also have perpetual manufacturing rights, allowing them to make, use and sell chips forever. If the Merged Entity suddenly announced that it would breach its contracts (and its commitments to regulators) and refused to license henceforth, licensees could still manufacture and sell Arm-based chips throughout the ***next decade***—and sell them for even longer (because all Arm licensees have perpetual manufacturing rights). Licensees would have plenty of time to find alternatives, with no benefit to the Merged Entity for many years. Accordingly, the Merged Entity cannot foreclose Arm customers, even if it wished.

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[36] Throwing Down The Gauntlet To CPU Incumbents, The Next Platform (February 11, 2020), available at <https://www.nextplatform.com/2020/02/11/throwing-down-the-gauntlet-to-cpu-incumbents> (emphasis added).

C.   **No incentive to foreclose**

(i)   Attempting to foreclose would be economically irrational.

The Decision argues that when the Transaction closes, NVIDIA will declare that its promises to customers and regulators have been a ruse and will announce itself to be the world's single source of Arm CPUs for datacenters.

Even if that were possible (and it is not), NVIDIA knows that such a strategy would be self-defeating, and has no incentive to pursue it. The Decision does not explain why ***any*** downstream customer would embrace a sole-source ecosystem. Even x86 has always had two *bona fide* suppliers (Intel and AMD), and now, x86 is licensable to anyone. Unable to explain why NVIDIA would try to foreclose, the Decision argues that Arm's few datacenter customers are so happy with Arm and would never leave, no matter how badly Arm mistreats them. Even if that were true of some customers, the lion's share of the market does not use Arm ***at all***, meaning that customers would simply choose x86.

NVIDIA's incentives are straightforward and clear. By improving Arm CPU IP and licensing it to all interested parties, NVIDIA maximizes the probability of expanding the Arm ecosystem in the datacenter, creating new competition with Intel and AMD, and deconcentrating the datacenter CPU market with more CPUs and lower CPU prices. A deconcentrated datacenter CPU market translates into more acceleration opportunities for NVIDIA's GPU business, a fact the Decision ignores.

Furthermore, NVIDIA has every incentive to invest ***more*** in datacenter IP and ***grow*** an Arm ecosystem in datacenter, not crush it before it has a chance to succeed. Arm's CPU IP customers currently represent very low single digits of the datacenter market, so the Merged Entity would have little to foreclose. If the Merged Entity could foreclose access to Arm IP for datacenter CPUs, customers would simply turn to Intel IFS/x86, or to other options. No economically rational entity would engage in a foreclosure strategy that guaranteed an immediate loss of licensing revenues and future lost royalties for an uncertain future gain.

(ii)   Attempting to foreclose would damage NVIDIA's business and reputation.

Foreclosure would damage NVIDIA's business in a myriad of other ways. Arm's customers are NVIDIA's customers and suppliers—NVIDIA cannot antagonize them.

For example, NVIDIA engages in projects with **AWS**, **Microsoft**, **Google**, and other leading software creators for datacenters. For NVIDIA to succeed, the world's largest software operators and cloud service providers must continue to support NVIDIA-accelerated platforms, and decide to port their software to work on the Arm ISA.

NVIDIA also welcomes collaboration with **Qualcomm**, which is the dominant supplier of 4G and 5G chips. Qualcomm is one of Arm's most important customers due to its leading position in the mobile segment. At the same time, [✂]. Accordingly, Qualcomm has immediate power over NVIDIA and Arm, while it enjoys long-term protection for its current and future designs against strategic behavior by the Merged Entity.

Large datacenter customers, including AWS, Google, Microsoft, and leading OEMs, have enormous R&D budgets, purchasing power, and leverage. They can choose from a complete suite of products from x86 suppliers Intel and AMD (including CPUs and GPUs) or build their own custom products. NVIDIA seeks to work with them, not foreclose them. The

Decision's assertion that "*the limited alternatives to Arm… will undermine any buyer power (and any contractual protection) that licensees may have*"[37] does not hold water, in particular given the alternative suppliers outlined above.

D.   No SLC in the supply of datacenter CPUs

Compared to a standalone Arm, the Merged Entity will promote competition, not lessen it. Arm datacenter CPUs account for only a sliver of the datacenter CPU market, while the vast majority of datacenter servers use x86 CPUs and would be unaffected by any foreclosure attempt (representing over 95% of the market for datacenter CPUs). The only theoretical area of future foreclosure—new Arm-based CPU cores from implementation licensees— would have no effect on competition in datacenters.

3.   DATACENTER SMARTNICS

Relying again on customer testimonials, ignoring competition from x86 and RISC-V, and neglecting the limitations of Arm's business, the Decision contends that the Merged Entity may have the ability and incentive to foreclose competitors in the nascent downstream SmartNIC market.[38] To the contrary, the Merged Entity would have every reason to expand Arm's IP and license it to everyone.

A.   Summary of the Parties' activities

Arm supplies general-purpose CPU IP which can be used in any processor. Arm's Cortex-A is used in (amongst others) many SmartNICs for their principal processing function.

NVIDIA supplies finished SmartNICs based on the Ethernet and InfiniBand communication protocols.

B.   No ability to foreclose

(i)   *Arm has no market power in CPU IP licensing used in SmartNICs.*

SmartNICs are peripheral devices that do not require specific IP. General-purpose CPU IP suitable for SmartNICs is available from a range of suppliers other than Arm, including SiFive and other RISC-V vendors. Nonetheless, the Decision cites an Arm customer that declares "*Arm-based processors are an 'essential piece' of a SmartNIC as they have the right mix of power, performance and ability to interface various IP blocks needed in a SmartNIC.*"[39]

Customer satisfaction with an Arm product does not reflect market power. The question is not whether Arm's current customers are satisfied with Arm IP (they chose it, after all) but rather, whether the Merged Entity would have the power to foreclose **competition**.

In the hypothetical event of foreclosure, SmartNIC suppliers could switch to any other supplier of CPU technologies for the next generation of SmartNICs. Intel and AMD could turn to their own x86 CPU technology or RISC-V, as Intel recently has for its next generation

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[37]   The Decision, para. 7.65.

[38]   The Decision, para. 7.115.

[39]   The Decision, para. 7.45(a).

of "soft processors" for its FPGAs.[40] Other SmartNIC providers could license x86 from Intel or proprietary designs from companies such as Synopsys, buy RISC-V and Power alternatives (*e.g.*, from SiFive, Andes, or MIPS), or take these open-source ISAs and build their own.[41]

Indeed, SiFive's CPU IP (including its next-generation microarchitecture, which SiFive states "*is within reach of Arm's Cortex A78 and Intel's Rocket Lake family*"[42]) is capable of addressing the requirements of SmartNICs. The Decision fails to provide any reason why RISC-V would not constitute a viable alternative to Arm, especially in the long timeframe at issue.

(ii) *Arm licensees are contractually protected against foreclosure.*

The same arguments discussed above in relation to the contractual provisions protecting Arm customers in relation to datacenter CPUs also hold true for SmartNICs. As a result, NVIDIA cannot foreclose competition in SmartNICs.

C. No incentive to foreclose

As with datacenter CPUs, the Merged Entity would immediately forgo licensing revenues if it attempted to foreclose new IP, but it would ***not*** shift any downstream sales for years, if ever.

SmartNIC competitors such as Intel and AMD/Xilinx have demonstrated that state-of-the-art SmartNICs do not need to use the most current Arm IP—they are using Cortex-A53 cores, a decade old. Refusing to grant new licenses to any SmartNIC customers or degrading their terms would merely push the entire SmartNIC market to Intel and AMD, who do not need new Arm IP to succeed. Moreover, as decade-old CPU cores are adequate to make state-of-the-art SmartNICs, Arm competitors such as SiFive, Andes, MIPS, and others would immediately step in and offer CPU cores that are more than adequate.

To the extent that Intel and AMD/Xilinx wish to use new Arm IP over their own x86 designs, NVIDIA has no reason to antagonize them. NVIDIA's products must work with x86 CPUs from **Intel** and **AMD**, as the majority of NVIDIA's revenue continues to be based on x86 systems for the foreseeable future.

D. No SLC in the supply of SmartNICs

Arm customers appreciate Arm IP today, but it does not follow that the Transaction will harm competition. As is the case in the analysis of datacenters, the Decision elevates customer testimonials and complaints over economic reality, the law, and common sense. Even if the Merged Entity wished to follow an irrational foreclosure strategy, it could not foreclose competition in SmartNICs, and would have no incentive to do so.

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[40] Nios V Processor, Intel, available at https://www.intel.com/content/www/us/en/products/details/fpga/nios-processor/v.html.

[41] See Merger Notice, paras. 589 to 594.

[42] SiFive Envisions 128-Core RISC-V SoCs as Gap With x86 and Arm Closes, Tom's Hardware (October 22, 2021), available at https://www.tomshardware.com/news/sifive-develops-ultra-high-performance-risc-v-core.

4. DATACENTER CONGLOMERATE EFFECTS

The Decision raises a series of "conglomerate" fears, arguing that the Merged Entity might find a way to combine NVIDIA and Arm technology to hurt competitors.

A. The Merged Entity would not have the ability to engage in tying or bundling.

The Decision contends that the Merged Entity will tie or bundle, citing vague and unsubstantiated allegations that NVIDIA has engaged in "aggressive bundled pricing."[43]

However, the Decision does not explain why the CMA is criticizing NVIDIA for charging *low* prices to customers—that is the essence of competition and should be exactly what the CMA wants to see.

In any event, the Merged Entity would have no ability to engage in merger-specific tying or bundling. Arm licenses IP that customers design into chips that will not reach the downstream market *for years*. NVIDIA sells GPUs and associated platforms to downstream customers that will be used in datacenters *immediately*.

The Merged Entity cannot tie or bundle the Arm and NVIDIA products because the customers are different and the purchasing decisions are made at entirely different times.

The Decision raises another theory that is not merger specific, claiming that "*the common set of third parties demanding NVIDIA's products and Arm-based products in datacentre will grow.*"[44] That is not a legitimate objection to the Transaction. Even if more customers want bundles of NVIDIA and Arm-based downstream products, that concern has nothing to do with the Transaction—any Arm licensee, including NVIDIA, can sell its own accelerators and Arm-based products together.

Even if NVIDIA offered discounted "mixed bundles" of Arm-compatible CPUs (which NVIDIA does not make today) and other NVIDIA components, it could not foreclose Intel and AMD, which have their own ability to create CPU bundles with x86.

B. The Merged Entity would not have the ability to foreclose by degrading interoperability or distorting Arm technology.

The Decision accuses NVIDIA of planning engineering mischief, contending that the Merged Entity will find a way to modify the interoperability of Arm-based datacenter CPUs and SmartNICs to (1) *enhance* the interoperability between various NVIDIA products and, simultaneously, (2) *undermine* the interoperability between competitors' Arm-based CPUs and NVIDIA products.[45]

The Decision does not explain how the Merged Entity could accomplish such a remarkable feat. Instead, the Decision recites a list of NVIDIA technologies (NVLink, CUDA) and

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[43]   The Decision, para. 7.93.

[44]   The Decision, para. 7.97.

[45]   The Decision, paras 7.100 and 7.108.

claims that NVIDIA might "*sell [...] product combinations more effectively through modifying product interoperability in NVIDIA's favour.*"[46]

The Decision's theory is wildly off-base.

First, Arm's customers, **not** Arm, make their own CPUs, and they have complete control over the chip interfaces they use. The Merged Entity cannot change that fact.

Second, interoperability is not determined by any Arm product—rather, interoperability is determined by the chip itself (*e.g.*, an SoC) that **surrounds** the Arm IP. Arm does not supply the input/output IP for these chips and has no insight (and no need for insight) into customers' interoperability choices.

Furthermore, even if NVIDIA could somehow distort Arm IP to benefit itself, the Merged Entity could not do **anything** to foreclose Intel and AMD's suite of chips, or foreclose the architectural licensees such as Apple, Qualcomm, and Microsoft. The concern is a red herring.

C.   **No incentive to foreclose**

The Decision ignores reality, contending that NVIDIA will seek to foreclose because it would only lose "*some CPU IP licensing revenues.*"[47] To the contrary, the Merged Entity has no incentive, ability, or expertise to engage in such far-fetched schemes.

First, any attempt to foreclose datacenter CPU, GPU or SmartNIC suppliers (especially Intel and AMD) would jeopardize NVIDIA's business in the x86 ecosystem, which is far larger than the Arm space.

Second, any attempted foreclosure would destroy NVIDIA's investment in Arm, because it would (i) undermine the creation of the ecosystem network effects that are crucial to Arm's success in datacenters; (ii) reduce third parties' and customers' incentives to buy into the Arm ecosystem; (iii) not allow NVIDIA to benefit from the diversification of risks downstream; and (iv) jeopardize customers' trust in and commitment to the Arm ecosystem in the datacenter market (and in other markets).

D.   **No SLC**

No conglomerate strategy could result in a substantial lessening of competition in datacenter; nothing the Merged Entity can do would foreclose Intel and AMD.

5.   **GENERAL-PURPOSE PCS AND CONSOLES**

The Decision raises concerns about two other areas where x86 is dominant—general-purpose PCs[48] and high-end gaming consoles ("**Consoles**").

Regarding general-purpose PCs, the Decision simply states that after a year, "*the CMA has not been able to investigate [the general-purpose PCs] area sufficiently to come to a*

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[46]   The Decision, para. 7.80.

[47]   The Decision, para. 7.106(d).

[48]   General-purpose PCs are PCs which are not equipped with high-performance discrete GPUs (*i.e.*, PCs which are not high-end gaming PCs).

conclusion as to whether there is a realistic prospect of an SLC."[49] NVIDIA is not present in PC CPUs, and the analysis of the general-purpose PC market could not be more straightforward.

The Decision offers little more in Consoles, where NVIDIA competes, but x86 controls most of the market.[50]

A.   Summary of the Parties' activities

Arm does not supply PC CPUs or Consoles; it licenses general-purpose CPU IP that is used primarily for SoCs in mobile devices. Arm's general-purpose CPU IP is also used in some PC SoCs, but its adoption rate has been *de minimis* ([0 - 5]% market share by volume and [0 - 5]% by value in 2018-2020).

Arm's [✂] implementation licensees for PCs are Qualcomm (although Qualcomm also has an architectural license and has acquired another one following its purchase of NUVIA) and MediaTek, whose market shares by volume are less than [0 - 5]% and [0 - 5]%, respectively, in 2018-2020 (less than [0 - 5]% in terms of value for both licensees).[51,52] Arm's market share in CPU IP for PC SoCs is not expected to grow materially in the foreseeable future, regardless of Apple's transition to the Arm ISA.

Arm has no meaningful presence in PC GPUs; its GPU IP is designed for mobile, not PC.[53]

Arm does not supply any gaming components, or design IP targeted at Consoles (nor does Arm currently have any plans to develop such an offering in the future).

NVIDIA does not make PC CPUs. NVIDIA's GEFORCE GPU business is complementary to CPUs. Today, the overwhelming majority of NVIDIA's GEFORCE business and R&D effort supports x86 CPUs and platforms.

In Consoles, NVIDIA supplies semi-custom SoCs for Consoles (specifically, Nintendo Switch). NVIDIA does not license the GPU IP technology that enables it to compete effectively in the supply of Console SoCs.

B.   No ability to foreclose

Intel's x86 CPUs dominate the PC space; Arm's presence in general-purpose PCs is *de minimis* and no Arm ecosystem exists in general-purpose PCs. Arm licensees such as Qualcomm and Apple have architectural licenses and make their own IP to compete with Intel in PCs—they do not use Arm's designs and cannot be foreclosed.

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[49]   The Decision, para. 8.8.

[50]   The Decision, para. 7.238.

[51]   Market shares by proxy of downstream SoC sales.

[52]   Arm cores are only used in the following Windows PCs (all of them laptops): Lenovo IdeaPad 5G, Samsung Galaxy Book S LTE, ASUS NovaGo TP370QL, HP Elite Folio, and Microsoft Surface Pro X. All of them were launched in or after 2020. Arm cores are also used in Chromebook devices.

[53]   Arm is not tracked by industry analysts such as IDC and Mercury. To the extent that a few Chromebook OEMs use Arm Mali, they would do so using mobile SoCs and this would be included in the market shares provided to the CMA for mobiles and other iOS and Android devices.

As Apple's former head of Mac development, Jean-Louis Gassée, observed in relation to Apple, this means that "*Apple designs its own Silicon and has a perpetual Architecture License that gives them total freedom*" and, consequently, the Transaction would have no "*strategic impact on Apple*".[54] This applies equally to Qualcomm/NUVIA. The Merged Entity would have no ability to profit from any foreclosure strategy in PC.

In Consoles, three customers purchase semi-custom SoCs—Sony (PlayStation), Microsoft (Xbox), and Nintendo (Switch). AMD currently (and exclusively) supplies SoCs for both Xbox and PlayStation, while NVIDIA supplies Nintendo. Intel may enter in the future,[55] although the Decision does not identify Intel (or anyone else) as a potential competitor.

Both AMD and Intel design SoCs based on their x86 CPU and GPU technologies and are therefore not Arm-dependent. The Merged Entity obviously cannot foreclose AMD's x86 SoCs, and therefore, cannot foreclose competition in Consoles.

Nevertheless, the Decision argues that other Arm licensees **might** in the future wish to compete with Intel and AMD in the general-purpose PC and Console markets. The CMA's Merger Assessment Guidelines make clear that, when considering potential entry by third parties as a countervailing factor, only entry that is **timely** (typically within two years),[56] likely and sufficient is relevant. It would be incongruous for the CMA to apply a different standard when considering potential entry in this case. It is clear that any hypothetical entry in this space would be neither timely, nor likely.

The Decision does not identify any Arm-based PC or Console SoC supplier that (i) could make a competitive SoC in that timeframe, and (ii) does not **already** have the Arm license it needs to do so.

Even if the CMA could identify any such potential competitor, Intel's decision to license its x86 CPU IP would grant any such entrants an alternative to Arm that already has established success in the PC and Console space.

C.   No incentive to foreclose

NVIDIA has no incentive to foreclose in PCs or Consoles. Even if NVIDIA chooses to enter the PC CPU space, its primary competitor would be Intel (and AMD) x86 CPUs, not other Arm customers. If the Merged Entity refused to license IP to any potential Console entrant, Intel or the RISC-V licensors would do so. Attempting to foreclose competition in PC and Console would be just as irrational as in datacenter, and for all the same reasons: the attempt could not possibly help NVIDIA's downstream sales for years (if ever), would destroy Arm's business, and harm NVIDIA's reputation. And of course, as discussed in Section 2.B(iv), above, Arm licensees are contractually protected against any foreclosure attempt by the Merged Entity.

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[54]   *See* https://twitter.com/gassee/status/1305025521428774912.

[55]   Intel is expected to release a GPU dedicated to gaming in Q1 2022. See Intel's Arc GPUs will compete with GeForce and Radeon in early 2022, ArsTechnica (August 16, 2021), available at https://arstechnica.com/gadgets/2021/08/intels-arc-gpus-will-compete-with-geforce-and-radeon-in-early-2022.

[56]   CMA Merger Assessment Guidelines, para. 8.33.

D.   **No SLC**

NVIDIA seeks to grow and enhance Arm's IP in PC, and to license it broadly, helping Arm to build an ecosystem in PC. NVIDIA's strategy would undeniably benefit Arm, the UK, and Arm customers worldwide, not harm competition. The Transaction will spur competition in Consoles, as NVIDIA will have an incentive to enhance Arm's IP to compete with x86 chips from Intel and AMD.

6.   **INTERNET OF THINGS**

The Decision contends that the Transaction will create an SLC in the "Internet of Things". But NVIDIA is **not** a commodity IoT chipmaker and does not participate in the broad IoT market that concerns the CMA. To the contrary, NVIDIA is pioneering a nascent and narrow space, where Intel's x86 is the primary competitor.

A.   **Summary of the Parties' activities**

Arm licenses general-purpose IP that can be integrated into SoCs for use in IoT devices. Its Cortex-M and -R series of CPU cores are optimized for low-cost and energy-efficient microcontrollers ("**MCUs**") and can perform low-performance ("**LP**") IoT functionalities. Arm also licenses IP that can be integrated into high-performance ("**HP**") IoT devices. Within HP IoT, most of Arm's customers focus on high-volume applications that do not require intensive AI analytics, such as wearables, smart TVs and cameras.

NVIDIA is active in only a narrow area related to IoT, "Autonomous HP IoT" (*i.e.*, computationally-intensive applications such as machine learning and AI). NVIDIA does not offer products for the LP IoT or other HP IoT applications. In addition, NVIDIA does not license any of its own IP on a revenue-generating basis.[57]

Autonomous HP IoT focuses on compute-intensive applications that NVIDIA targets with its GPU and software offerings. NVIDIA's leading GPU architecture, software stack, and tools for autonomous applications differentiate NVIDIA's Autonomous HP IoT offerings.

The Decision mischaracterizes NVIDIA's activities (and, consequently, mischaracterizes the vertical relationship between the Parties), claiming that NVIDIA offers "entry-level" IoT products.[58] To the contrary, NVIDIA's "entry-level" (*i.e.*, Jetson Nano), "mid-range" and "high-performance" products are **not** general purpose IoT devices—they are **all** part of the narrow HP IoT niche that NVIDIA is pursuing.

B.   **No ability to foreclose**

   (i)   ***Intel, the leading competitor in the nascent segment that NVIDIA targets, does not rely on Arm IP and cannot be foreclosed.***

NVIDIA is not a commodity chipmaker for IoT. Rather, NVIDIA focuses on a narrow segment where Intel's x86 platforms are the primary competitor.

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[57]   For completeness, NVIDIA licenses its NVDLA design, a deep learning accelerator to execute machine learning algorithms, to third parties on a royalty-free, open-source basis to promote the adoption of deep-learning inferencing in third-party designs and IoT devices.

[58]   The Decision, para. 7.123.

The Decision concedes that Intel does not use Arm IP for Autonomous HP IoT and therefore, cannot be foreclosed. Nonetheless, the Decision dismisses Intel as a meaningful competitor, contending that "*Intel-based SoCs are power and cost-inefficient for IoT applications generally.*"[59]

NVIDIA is not active in the market "for IoT applications generally." Rather, NVIDIA competes with Intel in the nascent Autonomous HP IoT market, where Intel is NVIDIA's strongest competitor. Intel will continue to be a significant competitive constraint on the Merged Entity, thanks to its large and expanding portfolio,[60] large customer base, and vast R&D capacities. Intel's use of x86-based in-house designs for its Autonomous HP IoT solutions precludes any hypothetical attempt at foreclosure.[61]

(ii) *Arm has no market power in the narrow market that NVIDIA pursues.*

Even if the Decision could ignore Intel and x86, Arm has no market power in the nascent space that matters for this analysis—Autonomous HP IoT.

NVIDIA's future competitors in Autonomous HP IoT could use any of several alternative CPU IP suppliers including RISC-V, MIPS, or Power, or even develop in-house technologies. Future competitors do not need the newest Arm CPU to compete in Autonomous HP IoT—they can develop their own GPUs or accelerators, just as NVIDIA has done. For example, some versions of NVIDIA's Jetson platform use a very old version of Arm's CPU IP (*i.e.*, Arm Cortex-A57) dating back to 2012.

Furthermore, future competitors do not need to use Arm IP for software compatibility— Autonomous HP IoT devices run custom, embedded programs, not a large library of third-party software. For example, Jetson developers write their software for their own Autonomous HP IoT solutions, not for others. In other words, the Arm ISA does not have a significant software "lock in" effect in the Autonomous HP IoT space—and even if customers wanted to shift to other hardware, they can port their software to a competing CPU ISA, such as RISC-V.

The Decision again notes that Arm customers in the IoT space are happy with Arm's IP and performance. Customer testimonials are beside the point. The question is not whether Arm customers appreciate its IP—they do—but rather, whether Arm has ***market power*** that the Merged Entity could abuse, and in the Autonomous HP IoT space, Arm does not.

C.   **No incentive to foreclose**

Any attempt at foreclosure in the Autonomous HP IoT segment could not be profitable because NVIDIA's primary competitor is Intel, not Arm's other customers. The effort would be just as irrational as in datacenter, and for all the same reasons: the attempt could not

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[59]   The Decision, para. 7.132.

[60]   In 2020, Intel continued to expand its industrial and Autonomous HP IoT offerings by launching several new products, including the 11th Gen Intel Core processors, Intel Atom x6000E series processors, Pentium processors, and CeleronN and J series processors.

[61]   Intel's platforms use the x86 ISA. They also include a "Programmable Services Engine" (PSE) with an Arm Cortex-M7 microcontroller. See Driving performance, integration, and versatility with Intel's first Enhanced   for   IoT   platform,   Intel   Platform   Brief,   available   at https://www.intel.com/content/dam/www/public/us/en/documents/platform-briefs/enhanced-for-iot-platform-brief.pdf.

possibly help NVIDIA's downstream sales for years (if ever), would destroy Arm's business, and harm NVIDIA's reputation. And of course, as discussed in Section 2.B(iv), above, Arm licensees are contractually protected against any foreclosure attempt by the Merged Entity.

D.   No SLC

The Transaction presents no SLC in any area of IoT. Even if the Merged Entity had the ability and incentive to attempt to foreclose downstream rivals, which it does not, such a strategy would not harm effective competition in relation to HP IoT applications (notwithstanding that is not the relevant downstream market, as explained above). Existing and prospective entrants are not dependent on Arm's IP, as they can use rival IP (x86, RISC-V, MIPS) or develop their own in-house technologies swiftly.[62]

To be clear, although NVIDIA does not compete in the broad IoT market or plan to enter it, NVIDIA does not intend to allow Arm's position in IoT to atrophy and cede the IP licensing field to Arm's competitors. Rather, NVIDIA is committed to support Arm's roadmap and to accelerate innovation in that space.

7.   AUTOMOTIVE (ADAS AND INFOTAINMENT)

Finally, the Decision contends that the Transaction will cause an SLC in automotive markets for Advanced Driver Assistance Systems ("**ADAS**") and infotainment.[63] As with every other market, the Decision ignores the impact of Intel and AMD's platforms and products (including Mobileye), mischaracterizes the limits on Arm's business, and misstates NVIDIA's position.

A.   Summary of the Parties' activities

Arm does not supply SoCs for automotive applications. Rather, it licenses IP to semiconductor vendors. **NVIDIA** supplies finished SoCs and SoC-based platform solutions, primarily for autonomous driving. NVIDIA does not create new designs for "legacy" infotainment, but instead focuses on computation-intensive AI-enabled solutions that benefit from NVIDIA's unique expertise.

B.   No ability to foreclose

As with every other market, the Decision ignores the impact of Intel, claiming that Arm has "market power" that the Merged Entity could abuse.

Arm does not have market power in the markets for IP licensing for ADAS/autonomous driving or infotainment. Arm's market share in CPU IP in ADAS/autonomous driving ([20 - 30]%) and infotainment ([10 - 20]%) does not confer market power on Arm (volume, 2018–2020 period).

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[62]   Similar considerations also hold true in relation to GPU IP and ISP IP. For completeness, the Parties note that in relation to GPU IP, NVIDIA's actual and potential competitors are not dependent on Arm GPU IP. These include, among others, Intel, AMD and Texas Instruments. Arm has [✕] GPU IP royalties in IoT, approx. USD [✕], which accounted for only [✕]% of Arm's total IoT royalties in FY 2019. As regards ISP IP, NVIDIA's actual and potential competitors do not depend on Arm's ISP IP, as many of them have ISP IP in-house capabilities. Arm has [✕] ISP IP royalties in IoT, approx. USD [✕], which accounted for only [✕]% of Arm's total IoT royalties in FY 2019.

[63]   The Decision, para. 7.209.

The Decision dismisses concrete market shares as understating "*Arm's current and potential future strength*",[64] relying on testimonials from Arm customers. Arm customers may be satisfied with Arm's products and prices, but Arm is far from the only game in town: Intel/Mobileye has used MIPS and x86 for years, and robotaxi services (Waymo, Uber*, etc.*) have used Intel's x86. MIPS processors reportedly power more than 80% of ADAS-enabled cars today,[65] with a total of 40 million cars on the road (in over 300+ car models).

In addition, Intel is targeting automotive with its IFS licensing program, emphasizing that it will "*launch Intel Foundry Services Accelerator to help automotive chip designer's transition to advanced nodes*" and that it will offer "*both custom and industry-standard intellectual property (IP) to support the unique needs of automotive customers.*"[66]

The Decision dismisses RISC-V as a competitive threat to Arm for the next decade. But the Decision is contradicted by [✂]. The CMA cannot have it both ways.

In truth, RISC-V is a strong competitive threat to Arm, and it is only picking up steam.[67] RISC-V vendors are already seeing engagements in automotive and, in the years after the Transaction closes, RISC-V will gain more customers. SiFive is engaged in strategic partnerships targeting automotive, working with industry leader Renesas "*to jointly develop next-generation, high-end RISC-V solutions for automotive applications. The partnership will also include SiFive licensing the use of their RISC-V core IP portfolio to Renesas.*"[68] SiFive states that its CPU IP (including its next-generation microarchitecture, which SiFive states "*is within reach of Arm's Cortex A78 and Intel's Rocket Lake family*"[69]) is capable of addressing the requirements of ADAS SoCs.

In addition, Imagination Technologies recently announced its "*development and launch of a RISC-V CPU family, which will cater to both the discrete CPU market as well as the heterogeneous computing landscape.*"[70] This will further pave the way for RISC-V being used in automotive as a viable alternative to Arm CPU IP. A recent example of an automotive SoC vendor announcing a RISC-V-based SoC for ADAS is Kneron (which is supported by Qualcomm and Alibaba) in November 2021 (for Levels 1-2).[71]

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[64]   The Decision, paras. 7.163 and 7.178.

[65]   See Wave Computing Automotive Solutions, available at https://wavecomp.ai/automotive-solutions/.

[66]   Intel CEO Predicts Chips Will Be More than 20% of Premium Vehicle BOM by 2030, Intel (September 7, 2021), available at https://www.intel.com/content/www/us/en/newsroom/news/intel-mobileye-iaa-mobility.html#gs.dkzjiv.

[67]   See para. 627 of the Merger Notice for further details.

[68]   Renesas and SiFive Partner to Jointly-Develop Next-Generation High-End RISC-V Solutions for Automotive Applications, Renesas (April 21, 2021), available at <https://www.renesas.com/eu/en/about/press-room/renesas-and-sifive-partner-jointly-develop-next-generation-high-end-risc-v-solutions-automotive>.

[69]   SiFive Envisions 128-Core RISC-V SoCs as Gap With x86 and Arm Closes, Tom's Hardware (October 22, 2021), available at https://www.tomshardware.com/news/sifive-develops-ultra-high-performance-risc-v-core.

[70]   Imagination Technologies Enters the CPU Space With RISC-V Architecture, Tom's Hardware (August 25, 2021), available at: https://www.tomshardware.com/uk/news/imagination-technologies-risc-v-cpu.

[71]   Kneron's CEO stated that this is "*the first certified automobile-grade Kneron chip and is a steppingstone for the company to get more deeply into the automobile market*" (see Kneron Unveils Its First RISC-V SoC Built for Autonomous, Assisted Driving, InterpriseAI (November 3, 2021), available at

Nonetheless, the Decision ignores the competitive reality, arguing that Arm customers do not want to "switch" to the many alternatives. Again, the question is not whether customers *want* to switch. The question is whether customers *could* use other alternatives in the relevant timeframe, and whether those alternatives constrain Arm. (And NVIDIA has offered numerous assurances to try to ensure that customers do not feel any need to switch.)

Furthermore, if Arm had any "market power" in automotive, every economic theory holds that Arm would exercise it. Once again, the Decision fails to offer any explanation why, if Arm has market power in the automotive space, Arm fails to exercise it.

The record supports only one conclusion: while Arm customers are pleased with Arm's products and prices, the market is highly competitive, and Arm does *not* have market power.

C. No incentive to foreclose

Even if the Merged Entity *could* foreclose competition in automotive, it has no incentive to do so. The effort would be just as irrational as in datacenter, PC, Consoles, and IoT, and for the same reasons—the attempt could not possibly help NVIDIA's downstream sales for many years (if ever), would immediately destroy Arm's business, and harm NVIDIA's reputation and ability to work with others in the automotive ecosystem.

D. No SLC in ADAS or Infotainment

Competition in ADAS and Infotainment is strong and vibrant today, with multiple options and powerful competition from Intel/Mobileye, RISC-V, and Arm's architectural licensees.

Furthermore, to compete with Intel/Mobileye and RISC-V in the coming years, Arm will need an infusion of resources and technology, but as a standalone entity, Arm will have to make hard choices. It cannot invest and compete everywhere. Absent the Transaction, standalone Arm will not be able to grow and invest in datacenter, PC, IoT, and automotive— it will face great pressure to scale back investment, enhance profitability, and let the industry giants consolidate their power. By contrast, the Transaction will not result in a *lessening* of competition—it will promote and enhance competition in every market.

8. CONCLUSION

Deal opponents romanticize Arm's past and either ignore or disparage Arm's most powerful competition. But if Arm had market power, it would have sizable revenue growth and would be enormously profitable. If Arm alone could vanquish x86 in datacenter and PC, its market share would not be mired in the low single digits, and tomorrow's technologies—such as Omniverse—would be developed on Arm, not x86.

Rejecting the prospect of any remedy, the Decision would not promote competition. Rather, it would prevent Arm from bringing competition into areas that have been long dominated by x86. The alternative outcome urged by deal opponents would result in a standalone, profit-maximizing business without any guarantees about licensing policy or investments. It would

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https://www.enterpriseai.news/2021/11/03/kneron-unveils-its-first-risc-v-soc-built-for-autonomous-assisted-driving/). Kneron's has already been the preferred supplier for several electric vehicles, including Toyota.

likely result in less investment in the UK, less resources for Arm, less innovation, and less competition worldwide.