



CROSSROADS
CAPITAL LLC

5440 West 110th Street, Suite #300
Overland Park, KS 66211
+1 (816) 610-2437 | contact@crossroadscap.io

Another Bite of the Apple

2021 Annual Letter | March 2022



Think different.

You can't connect the dots looking forward; you can only connect them looking backwards.

– Steve Jobs

[H]ome consoles and handheld devices will no longer be completely different, and they will become like brothers in a family of systems... To cite a specific case, Apple is able to release smart devices with various form factors one after another because there is one way of programming adopted by all platforms.

– Satoru Iwata, 2014 Nintendo investor presentation

One of the things we have learnt over the last few years is our most profitable insights have come from recognizing the deep reality of some businesses, not from being more contrarian than everyone else.

– Nick Sleep

TABLE OF CONTENTS

<u>I. INTRODUCTION</u>	4
A. Opportunity overview	4
B. What is the market missing?	5
<u>II. BUSINESS MODEL TRANSFORMATION</u>	6
A. The Switch, like diamonds, is forever	6
B. Launching new devices the Apple way.....	11
C. Digitization of sales	25
D. Is the Apple Model working for Nintendo so far? Yes!	31
<u>III. WHY THE BEARS ARE WRONG</u>	36
A. “We’ve already reached ‘peak Switch’”	37
B. “Nintendo loves innovating too much to stick with just the Switch”	43
C. “Nintendo doesn’t invest for growth or reward shareholders”	46
D. “The Switch doesn’t have enough third-party support”	51
<u>IV. VALUATION</u>	56
A. Churn: Factoring in planned obsolescence	58
B. Our Base Case DCF.....	60
C. The Continuous Iteration Model: more realistic, yet still conservative	72
D. Putting a value on it	80
E. Nintendo’s “slam dunks”: Things we’re highly confident will happen	81
<u>IV. POOR EXECUTION: NINTENDO’S MAIN RISK</u>	87
A. Problems with NSO, mobile, and virtual worlds	87
B. Fixing the problems.....	89
C. Nintendo’s absolute commitment to quality	91
D. Macro issues	95
<u>VI. CONCLUSION</u>	95

APPENDICES

<u>APPENDIX 1: EVIDENCE THE SWITCH PRO IS COMING</u>	99
A. Massive investment in online infrastructure	99
B. Bloomberg article	99
C. Next-generation “System on a Chip” (SoC)	100
<u>APPENDIX 2: WHY THE SWITCH PRO IS SO IMPORTANT</u>	113
A. Lessons of the Wii era	113
B. Price and technology: Following Nvidia’s lead	114
C. Optimizing the Switch platform for third-party developers	115
D. Portable gaming competition.....	117
<u>APPENDIX 3: A “CONSOLE IN A CONTROLLER”</u>	118
<u>APPENDIX 4: MOVIES AND TV</u>	120

I. INTRODUCTION

Despite our general preference for small- and micro-cap growth businesses, the unique combination of Nintendo's massive opportunities and minimal risks makes it a company we simply must own. In fact, we believe Nintendo's current setup is perhaps the best in the company's modern history, and we've positioned the Fund to reflect that: As of mid-March, Nintendo remains our largest investment at roughly 25% of NAV.

A. Opportunity overview

Nintendo, a digital-first, increasingly high-margin, secular growth money machine with the widest moat in the history of gaming, currently trades as if it's a "hit-driven" hardware manufacturer on the cusp of terminal decline. Amazingly, *none* of the huge value-unlocking change that's taken place since we wrote about Nintendo in early 2019 is being reflected in its stock price.

However, Nintendo has made dramatic progress on several key fronts of our long-running thesis: First, it's moved full speed ahead on the "de-cyclification" of its dedicated console business. Second, it's aggressively shifted its revenue mix toward digital, online sales. Third, better monetization of its underutilized, "gold-plated" portfolio of peerless IP has not only come to pass, but will soon be reflected in Nintendo's financial statements in a way few seem to properly appreciate. Indeed, the ongoing overhaul of Nintendo's business we first highlighted years ago is almost halfway complete.

Yet despite evolving as we hoped it would, Nintendo remains nonsensically cheap. If that sounds like hyperbole, realize we're talking about a low double-digit multiple to its run-rate earnings power – and that's *before* backing out its roughly \$13bn in cash, or assigning any value to the \$15bn or so worth of non-core long-term investments on its balance sheet. Moreover, unlike most market darlings of late, Nintendo shouldn't have any problem generating sufficient earnings to justify its stock price in the years ahead. Even without multiple expansion, we believe earnings can compound at a CAGR of 20% or more over the next five years. Moreover, secularly growing, very high incremental ROIC businesses with widening moats and a clear path to price discovery like Nintendo rarely trade at no-growth prices for long.

We would add that this is especially important in a fragile market environment that feels increasingly dependent on central bank-fueled liquidity and low interest rates to maintain its momentum. After all, Nintendo not only offers tremendous downside protection, but its business should continue to grow revenue and expand margins largely irrespective of external factors or the nature of the market regime in place. In

the near-term, Nintendo's catalyst-rich event path should accelerate the recognition of value and lessen our dependence on the market and the economy for our investment gains – a near-perfect setup for sizing up a position in a market like today's.

B. What is the market missing?

Why is Nintendo so misunderstood? We think the main reason is that investors (and the sell side in particular) just don't appreciate the significance of the enormous value-unlocking change that's taken place at the company in recent years. It's a change that includes not just the fundamental transformation of its core business, but also a notable shift in corporate culture and a grand expansion in the scope of its strategic vision. Indeed, starting around the year 2015, Nintendo learned it must evolve to succeed. And succeed it has, and to a genuinely remarkable degree: As of the time of this writing, the Nintendo Switch is officially the best-selling Nintendo home console of all-time, effectively realizing the promise we identified all the way back in 2018.

Yet despite this success, we continue to believe Nintendo's best days are ahead. In fact, Nintendo's current setup reminds us of Apple's about a decade ago. Back then, the power of Apple's own radical transformation was consistently overlooked and understated for years, even as the iPhone became the most dominant consumer product in history. Those mistaken assessments didn't stop the stock from going up tenfold over the last decade, but they did cause occasional periods of investor doubt and unsustainably compressed multiples, just as we see with Nintendo today. Then, as now, institutional and retail investors alike had a hard time telling the difference between a hit-driven hardware manufacturer and an integrated hardware-software platform business, creating huge tactical opportunities to exploit this consistent misperception along the way.

With time, Mr. Market came to realize Apple's iPhone was not simply a single purchase device, but a ticket into a one-of-a-kind software-based ecosystem – and revalued the company accordingly. Of course, by now, whatever upside remaining from awareness of this key insight is negligible, as that view has become mainstream, and Apple is now a \$3 trillion business that has become the single most valuable company in the world. The real rewards, in other words, went to investors who understood the software and ecosystem aspects of Apple's growing potential early on. We mention it because we believe the market is just starting to go through a similar slow-motion awakening on Nintendo – and that means the time to buy is now.

While we're at it, we think seeing Nintendo's potential doesn't require any leaps of faith, let alone any proprietary data sets or analytical techniques. The facts are all right out there in the open. So why can't the sell side get the story right?

Well, the reality is that most sell-siders, driven by the short-term focus and poor incentives that characterize their profession, have been turning out lazy research and flawed arguments that illustrate a profound lack of understanding not just of the deep reality behind the ongoing transformation of Nintendo's business, but of its now more open-minded and shareholder-friendly executive suite. Indeed, these outdated sell-side views are a big reason why the market is still missing the plot – and they're also why we've written yet another massive missive on your behalf. In the pages below, we aim to make that plot clear.

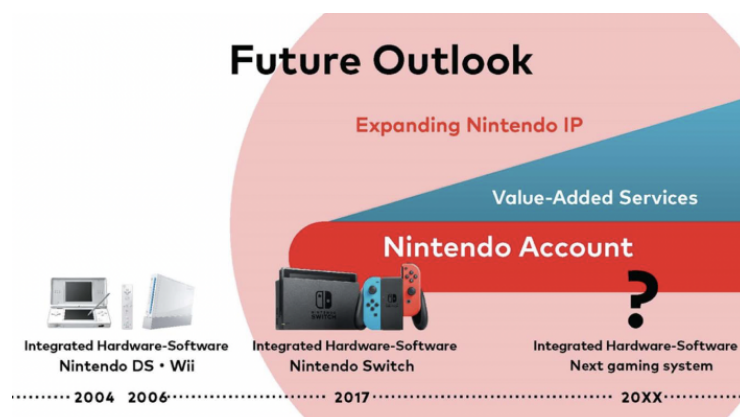
II. BUSINESS MODEL TRANSFORMATION

The heart of our thesis is that Nintendo has changed from a cyclical boom-bust business model to one marked by steadily expanding margins and predictable, secular growth. Like other videogame console makers, Nintendo once needed to rebuild its installed base of users each time it launched a new console. But no longer: Its massive 100-million-plus installed base of Switch family devices can now be continuously monetized in perpetuity.

A. The Switch, like diamonds, is forever

In short, just like Apple's iPhone family of devices (iPhones, iPads, Apple Watches, etc.), the Nintendo Switch family of devices is, for all practical purposes, "forever." As a result, Nintendo's installed base will never again reset to zero. Furthermore, the company's ongoing transition to an Apple-like iterative hardware model centered on a persistent digital ecosystem means that Nintendo is no longer the "hit-driven cyclical" it was. **With the Switch, it's created a software-driven unified gaming platform that, for the first time in the company's history, will be compatible with future generations of hardware.**

The slide below, from Nintendo's June 5th, 2021 presentation shows as much:



Note that it shows Nintendo's next gaming system could hit store shelves sometime between today and the year "20XX." While we don't expect the Switch platform to last until 2099, we do think it will be around for quite some time to come. (And whenever its "replacement" does arrive, we'd bet it'll be compatible with the latest iterations of Switch devices, easing whatever transition might be necessary.)

Of course, this transformation has profound implications for the quality and stability of the company's earnings power. Not only is the Switch family of connected devices evergreen in the same manner as the iPhone, but so is the Switch software library, just like apps in Apple's App Store, or games on Valve's Steam service for PCs. So in the same way that lots of different PCs can access games on Steam and lots of different iOS devices can use apps from the App Store, a variety of different Switch models will be able to access the Switch software ecosystem, much as the original Switch, the Lite, and the OLED model do today.

A recent VIC thesis from "Punchcardtrader" gets at the same point from a slightly different angle:¹

I believe that Nintendo's best days are ahead of it because its genius as a game maker will be amplified as Nintendo builds a direct and deep relationship with its gamer base whereas the current valuation seems to imply that Nintendo's earnings are not going to grow. This new relationship with its gamer base will transform Nintendo's historically cyclical revenue into a recurring one.

This is a well-documented argument by now. Two fundamental drivers: 1) the console hardware architecture is such that backward compatibility is much, much easier to achieve than before. 2) Unlike previous console generations, most console games are online now which means the game and its progress can be easily downloaded into a new console. The obvious parallel is iPhone – Switch gamers can expect their game to work just as games work on both iPhone 8 and iPhone 9. Not only does the game work in iPhone 9, but the gamer can also open the game and pick up right where he/she left off on their iPhone 8.

This is very important because it means persistent game worlds can work on Switch, which is critical to increasing gamer stickiness and growing average spend. This effectively means that the install base does not reset to zero with each product cycle. I have no idea when Nintendo would introduce the successor to the Switch, but I have a high degree of confidence that when it does, it would build off the existing 90+m install base.

It's hard to overstate the significance of Nintendo's shift to indefinitely-lived game software. Traditionally, games designed for a particular console couldn't be played on

¹ https://www.valueinvestorsclub.com/idea/Nintendo_Co_LTD/7531130903

its eventual successor². For example, users who amassed huge collections of Super Nintendo games could play them only on the Super Nintendo, and not on the more advanced N64 that came out six years later. Instead, they had to build up a library of games all over again, giving them virtually no incentive to stick with a particular console maker (such as Nintendo or Sony) when buying a next-generation game system. The result was dramatic shifts in market share from one console generation to the next, a dynamic that was the Achilles' heel of the videogame industry for decades.

Thankfully, with the Switch platform, Nintendo has liberated itself from this flawed business model. Switch devices today are released and then “spiral upgraded” every few years to deliver more and more value while leveraging the platform's original design and OS. This means that Nintendo's “next” console will not be an entirely new game system, incompatible with what came before it, but simply a better Switch, running on a better – but still fundamentally identical – Switch family OS. And because of this paradigm shift, Nintendo's user base, which it once had to fight to rebuild with each new console launch, is now pretty much permanent. Furthermore, Nintendo has started selling increasingly high-margin software and related online services to its ever-growing userbase. That strategy has arguably been the main reason for Apple's dramatic success over the past 15 years.

Furthermore, because Nintendo no longer needs to “re-acquire” customers from zero each time it launches a new console, it gets substantially more leverage on its IP now, in the Switch era, than ever before. We're talking its entire IP library, past and present. For example, there were some great games on the Wii-U that probably would have done blockbuster numbers if they had been sold into a Switch-like installed base, but were hampered by the Wii-U's poor sales. Just look at sales of *Mario Kart 8 Deluxe*. It was originally released in 2014 for the Wii-U and sold only 8m copies. However, it's gone on to become the single best-selling Switch game to date, selling over 43m units since the Switch platform's 2017 release.

Once upon a time, a failed console was the kiss of death for Nintendo's P&L, that is until it was eventually replaced by a new one, because its anemic installed base couldn't drive adequate sales of its best-in-class games. In the Switch era, Nintendo has no such fears. It can sell its software titles – both new and “classic” – into a massive, continuously growing installed base. In fact, a big reason why Nintendo is no longer the “hit-driven cyclical” it once was, is because of its stellar library of evergreen IP and the massive untapped pricing power that unrivaled library confers. Nintendo can simply remaster or “port over” decades-old titles from its globally-adored game

² After proofreading this section, my wife joked, “Nothing was more valuable in fourth grade than a friend who had all the videogames from the latest console.” I hadn't thought about it that way, but upon reflection I'd say anyone from the Nintendo generation would wholeheartedly agree!

franchises, drawing on everything it's ever done before when supplementing its annual lineup for upcoming new releases. Examples of this phenomenon include any of the Pokémon remakes, *Link's Awakening* (a game originally released on the Game Boy), and *Super Mario 3D World + Bowser's Fury*, (an updated Mario game bundled with a new title and supplemented with brand-new DLC). In this way, Nintendo can and does charge premium prices for games it designed and originally released years or even decades ago, reliably selling millions of new units every time, like clockwork.

This dynamic, together with its genius as a game maker, its adoption of an online subscription model, and its larger transition toward the digital distribution of its game software, is ultimately what gives Nintendo such incredibly stable, increasingly high-margin recurring cash flow year to year relative to the volatility of its earnings power historically.³

Taken together, these insights go a long way toward explaining why we have such a hard time taking the “This time is no different” crowd seriously anymore. After all, the historical factors that once caused Nintendo to register a few years of rapidly declining revenue and operating losses managing the transition to its “next-gen” consoles no longer apply. Nintendo designed the Switch platform from day one as a foundational base to be expanded upon without problems, just like the iPhone – and, we might add, just like eighth- and ninth-generation hardware from Nintendo's console rivals Sony and Microsoft. So Nintendo isn't exactly blazing a new trail when it comes to transforming its hardware into a perpetual recurring revenue center, and the same can be said for the ongoing digitization of its sales.

Granted, while Nintendo's transformation is both unique and superior in several key respects to the larger trend that has taken place in the industry over the last ten years, all any analyst must do to grasp the point is consider what has taken place at Sony since its eighth-generation PS4 debuted all the way back in 2013. Nintendo started on a similar journey toward its own unified digital first gaming platform roughly five years later, and has been hard at work catching up (as even a passing glance at its financials would reveal).

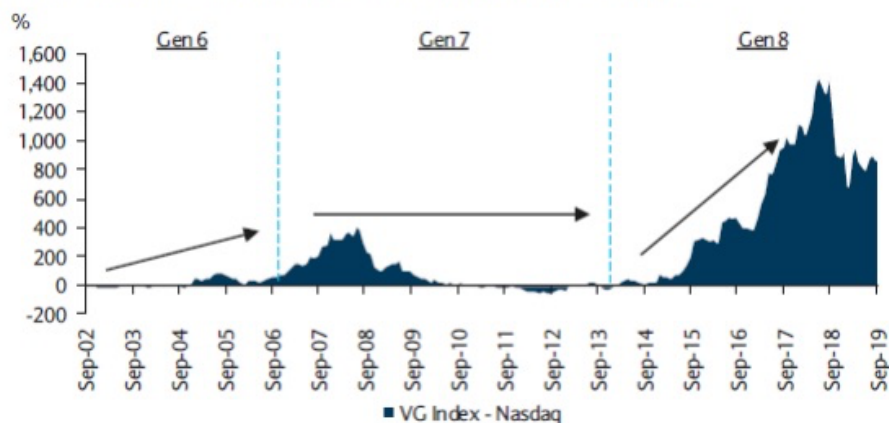
In any case, when it comes to the cyclicity of Sony's revenue and operating profit across console generations, the impact couldn't be clearer. As can be seen in the chart below, Sony's operating income turned negative during the transitions to the PS2, 3, and 4, but stayed strong during the transition to the PS5:

³ Better still, there are good reasons to believe that videogame IP is intrinsically more valuable than even the most blue-chip franchises in movies and TV. As tech investor Gavin Baker observed, the sales performance of “evergreen” videogame franchises like Mario, Zelda, and Pokémon is typically significantly less sensitive to the quality of their individual entries than the box office of a hit movie series is. These videogame franchises, therefore, generate a much more predictable revenue and profit stream than do their movie counterparts.



To make the same point in a slightly different way, let's take a step back and look at the equity returns of the videogame industry as a whole, if only to understand why, starting around 2013, past performance stopped being indicative of future results. Again, one of these periods doesn't look like the other, and for good reason:

Figure 9: Video Game Index vs. Nasdaq, Sept 2002 – Sept 2019



The reality is that the increasingly resilient, fast-growing videogame industry has become highly attractive over the last 10 years. Technological change has proven increasingly accretive, thanks to both the structural shift toward digital distribution and the pivot among console makers toward software-based gaming platforms focused on maintaining ever-growing, connected, device-based ecosystems. And

gaming's strength in the "attention economy" will only grow more powerful in the decades to come.

After all, the tailwinds propelling the industry are legion. Gaming not only offers perpetual access to the customer, but also far greater engagement than other forms of entertainment. Which is to say that videogames offer consumers a much better price-to-value equation than competing forms of entertainment media. And better value, bolstered by the structural change noted above, provides stable, predictable growth through the cycle. Add in adoption tailwinds like streaming, 5G, Video on Demand content from the likes of YouTube and Amazon's Twitch, and it's all but certain that more consumers will play than ever before over the next few decades.

Growth will not only come at the expense of market share donors like traditional ad-based television, but also from the rise of the next generation of gamers as the "Nintendo generation" passes the baton. In other words, with the average age of gamers globally at roughly 34 today, compounding growth will continue for a long time to come as my generation keeps playing and the older, non-gaming population is replaced by the generations to come.

Of course, the permanency of all this value-unlocking change strikes us as so obvious that it should hit any intellectually honest analysts in the face, if only they could leave their confirmation bias at the door and view Nintendo not as it was, but as it actually is in the present day and age.

B. Launching new devices the Apple way

Nintendo has wisely followed Apple's lead in moving to an indefinitely-lived hardware-software ecosystem, but the tricky part of such a strategy is getting users to keep buying new versions of the hardware your ecosystem is based on. So, let's look more closely at how Apple launches new hardware, and then we'll see how Nintendo is following that approach.

1. The Apple launch strategy

Apple's launch strategy for iPhones (and other iOS devices) has three key characteristics:

- i. Incremental upgrades, frequently released. New iPhones with smaller incremental upgrades are released on an annual or semi-annual basis, with major upgrades every three to four years to attract new users (i.e. expand the TAM) and catalyze replacement demand.

- ii. Forward and backward compatibility. New iPhones maintain backward compatibility with older ones, meaning they run all existing iOS apps. In addition, older iPhone models maintain forward compatibility to run all new iOS apps.
- iii. Planned obsolescence. Finally, Apple essentially forces users to upgrade eventually, via the planned obsolescence of older hardware generations.

Now wait just a minute, you might be thinking. What's the deal with that third point? We've been talking about how Apple's iPhone is an indefinitely-lived hardware platform with forward and backward compatibility, but now we're saying that older iPhones eventually become obsolete? Haven't we contradicted ourselves?

No. And to show why, we need to draw a distinction between (1) the sudden obsolescence of an old device when a completely new, incompatible successor is launched, and (2) the deliberate, managed obsolescence of older members of a *family* of devices as the family's average tech specs improve incrementally over time. The latter, which we'll call "planned obsolescence", is at the heart of the Apple Model.

As many of you may have experienced firsthand, the most recent version of Apple's iOS will run poorly, if at all, on iPhones several generations old. For example, the current version of iOS is all but unusable on, say, an iPhone 6. The simple truth is that Apple's virtuous circle of accelerating improvements means newer software generally requires newer, more powerful hardware to run properly. At the same time, newer, more powerful hardware makes it possible for developers to create more ambitious software with improved features and greater functionality – like Apple's TouchID, for example. So a company like Apple needs to ensure that its users continue upgrading to new hardware *within its family of devices* (e.g. by upgrading from an old iPhone to a new iPhone), instead of abandoning that family altogether (e.g. by upgrading from an old iPhone to a new Android OS phone).

2. Sweet, sweet lock-in: How Apple keeps users on board

So how does Apple keep its users from switching to Android phones? It does so in several ways:

- First, it maintains a **virtually identical user interface** across different iOS device generations, so that a user upgrading from an iPhone 6 will be able to immediately dive right in and start using today's latest and greatest iPhone 13 with essentially no learning curve.

- Second, it ties users to its platform via **user accounts** and **cloud-based data storage** that remain unaffected when users upgrade to newer iPhones, letting them **easily transfer purchased apps and services** from old iPhones to new ones.
- Finally, as noted above, it **releases new and improved devices frequently and encourages users to upgrade frequently** to benefit from those improvements. Therefore, most users are moving ahead only one or two generations each time they upgrade, experiencing few if any incompatibilities between their old apps and their new devices.

All these features make switching costs prohibitively high, effectively locking users into the iPhone platform. And it's not just about better processors and cameras with every generation, or the fact that a phone is the most important, most frequently-used possession most people have today (although, admittedly, the lure of that combination is strong). Indeed, it's about so much more than simply Apple's product development expertise.

For example, rare is the iPhone user who would abandon her painstakingly assembled collections of apps, music, movies, games, data, and more because she likes the looks of the new Google Pixel 6 Pro. And if that user also owns other Apple iOS devices, like an iPad, Apple TV, Apple Watch, AirPods, and so forth, then she'll be even less likely to jump ship. As a result of this self-reinforcing, one-of-a-kind world of hardware, software, and services, roughly 90% of iPhone users stay with Apple for their next phone purchase, an event that typically takes place every two to three years.

So from a user's perspective, the examples above represent the implicit lock-in effects that are par for the course when it comes to durable ecosystems. From user experience muscle memory, to switching costs related to data, to the network effects that come from having most of your friends and family in the same system, to cultural factors, music, news, privacy, and so on, everything works together to ensure Apple becomes the natural default choice for most users. In short, the sum of the parts of Apple's "walled garden" becomes much greater than the whole.

In fact, the positive feedback loop described above is what leads to a value proposition that, on balance, vastly outweighs what's on offer from cheaper or technologically superior alternatives. It's also what leads to reliable and durable growth. Consider Apple's iMessage. Reporting on Apple's increasing dominance among youth in the US, the *Wall Street Journal* recently attributed the iPhone maker's astounding 70% market share among those aged 18-24 largely to the lock-in effect associated with its iMessage service (as compared to Apple's 40% share of US

consumers more broadly).⁴ Apple's dominance, then, is ultimately about so much more than technical specs and the price point of the iPhone.

We mention it all here because from an Apple shareholder's point of view, the lock-in those high switching costs generate over time is a thing of beauty. In fact, we'd go so far as to argue that analysts and investors consistently and grossly mispriced Apple in the past primarily because they didn't recognize the true power of that lock-in. And we'd argue that Nintendo is undervalued today precisely because the market doesn't realize that it's fully adopted the Apple Model and the perpetual, ever-growing money machine that this type of durable ecosystem creates. **It's just replaced iOS family devices with Switch family devices, apps with videogames, and the App Store with the eShop.**

Of course, there are inevitable differences between the lock-in associated with a general-purpose device like the iPhone, and that of a dedicated gaming device like Nintendo's Switch. As with any analogy, the parallels only go so far. For example, some may argue that the iPhone offers a different value proposition to the consumer, in that lots of people own multiple consoles, but most people only use one cell phone. While that distinction is an entirely fair one, our thoughts are twofold: First, the stickiness that comes with an iterative model that allows gamers to retain their user data, games, and so forth will dramatically improve user retention relative to prior console changeovers. Second, now that Nintendo finds itself on the eve of releasing its first major upgrade, the launch of more powerful hardware may very well result in a world where a "Switch in every active console gamer's home" becomes the norm (more on this later on). Regardless, as we discuss below, while the intrinsic nature of the lock-in associated with Nintendo's dedicated gaming device is in some respects different, it's arguably just as strong.

3. Nintendo: Following in Apple's footsteps

It's easy to see that Nintendo's Switch release strategy came straight out of Apple's playbook of continuous improvement in terms of offering frequent incremental upgrades:

- First, Nintendo launched the original Switch in 2017.
- Then in 2019, it debuted the simplified, cheaper Switch Lite, as well as a slightly upgraded version of the original Switch. The Lite expanded the Switch's TAM by offering users a lower price point, smaller form factor, and almost twice the

⁴ https://www.wsj.com/articles/why-apples-imessage-is-winning-teens-dread-the-green-text-bubble-11641618009?mod=Searchresults_pos1&page=1

battery life. The upgraded original version also boasted much improved battery life and a slightly more efficient chipset, in a clear example of the sort of incremental upgrades mentioned above.

- Next, Nintendo took another incremental step forward in October by releasing a new Switch with a brighter, sharper OLED screen, twice as much memory, better sound quality, Bluetooth, better overall build quality, and an Ethernet port – all at a price point of \$350, compared to the original’s \$300. (Incidentally, the higher price point of this classic Nintendo “half-step forward” shows that Nintendo is also following Apple’s strategy of offering consumers a “good, better, best” product lineup, with each model priced accordingly.)
- We expect Nintendo’s next step in this iterative improvement process will be to unveil a high-end Switch “Pro” in the January-March 2023 quarter or the October-December 2022 quarter at the earliest.⁵ The Switch “Pro” would be the first major (as opposed to incremental) upgrade of the original Switch, and we expect it to kick off a massive, multi-year replacement cycle, while materially expanding the Switch family’s TAM. And this time around, Nintendo wouldn’t be gunning for budget conscious gamers, but the high-end gaming enthusiast, a cohort that Nintendo hasn’t courted since the GameCube all the way back in 2001.

But Nintendo isn’t following Apple’s lead just by releasing frequent incremental upgrades to the Switch. It’s also making sure its users stay “locked in” to the Switch platform in much the same way as Apple does: with online, cloud-based services accessed via user accounts and superior content.

Let’s start with Nintendo’s “Nintendo Accounts” initiative, which serves as the common foundation of a variety of consumer play experiences across platform generations, while making it possible for Nintendo to not only continue to layer in new online services, but to “lock in” its users over time. Nintendo Accounts link each Nintendo user to a unique user account that follows that user across a variety of different platforms, including the Switch, online services such as Nintendo Switch Online (“NSO”), and non-Nintendo hardware like smartphones.

This user account functions in much the same way that a Google account lets a user access various Google services, such as Gmail, Google Play, YouTube Premium and

⁵ How can we be so sure the Pro is coming? See Appendix 1.

YouTube TV. The obvious takeaway is that there are some very powerful “big data” and DTC (direct to consumer) advantages to locking one’s users into specific accounts in this particular way, as well as many potential synergies among Nintendo’s offerings on different platforms.

Consider the success of Nintendo Switch Online (“NSO”), the company’s first foray into subscription-based online gaming services, launched in September 2018. While still in its early stages of growth, NSO has already captured 32m subscribers, giving way to a dramatically more resilient recurring revenue and cash flow model within its core console segment that has permanently improved the overall quality of Nintendo’s business in a manner that the market doesn’t appreciate – at least not yet.

And NSO isn’t just a way for Nintendo to predictably grow sales and expand margins. In a very real sense, it also makes Nintendo’s “indefinitely-lived console” business model possible to begin with. That’s because it lets Switch users not only save their game data to the cloud, but also carry that player data over to new versions of the Switch family they may buy down the road. In conjunction with Nintendo’s user-specific Nintendo Accounts, NSO provides the mechanism that makes “lock-in” for its hardware-software ecosystem work in the first place, as users can now maintain not only their software library, but their in-game progress indefinitely.

Which brings me to our next point: The value of data (as it relates to switching costs) should be primarily thought of in terms of its value to users, and practically no data in the digital world is as valuable to the user as player data in the videogame space. Leaving aside videogames’ dramatically superior “price-to-fun” ratio compared to those of other forms of entertainment media, the amount of engagement and overall time users invest into their favorite titles relative to other forms of entertainment makes maintaining that “work” considerably more valuable, if only because it’s so personal.

For example, a few years back I put in over 400 hours playing arguably the greatest videogame of all time, *The Legend of Zelda: Breath of the Wild* (as part of our due diligence, of course). After all, what better way to reacquaint myself with the videogame world, and Nintendo specifically, then by tackling the latest entry in my favorite videogame series as a kid. Fast forward a few years and the mere thought of losing my in-game data on even this single title makes me sick, given both the time

invested and the nostalgia involved.⁶ And this from a guy who, up until that point, hadn't played a videogame in over 15 years!

Now multiply that single example by hundreds of beloved new and classic games, and you can begin to appreciate just how meaningful a user's software library and associated data can be to him or her. And considering this IP is only available on the Switch platform, it's not like anyone has the option of moving those games and data to a location not connected to a Switch family device. Just as proprietary elements of Apple's ecosystem stay within its "walled garden," Nintendo imposes contractual terms and technical restrictions that make it impossible to legally download and transfer games (and their player data) to unauthorized devices.

Remember too that for many users, videogame consoles are frequently used (and thus highly important) possessions, in much the same way that smartphones are. And this is even more true with the Switch, given that it's a portable device users can take with them anywhere they go. Consequently, Switch devices experience a considerable amount of natural wear and tear that isn't an issue with home consoles, so it's only a matter of time before they need to be replaced. And as just noted, the only way to replace it without losing all the precious games and data built up in the intervening years is to buy another. Add in the well-established trend toward multi-Switch households as users purchase new form factors to supplement their existing systems, and there is clearly a lot of room to run yet when it comes to further entrenching the Switch as gamers' go-to platform. The fact is that Nintendo's rollout of new Switch devices and services has barely even begun.⁷

In any case, NSO's importance will only grow, considering that the service establishes a direct line to building up and maintaining customer relationships. After all, Nintendo has committed to continuously adding value to NSO through new and exclusive content, providing users with increasing value for their money over time.

For example, a subscription to NSO doesn't just unlock online play and cloud-based data storage for its users. It also delivers a steady stream of special offers, free demos, and access to exclusive online multiplayer titles (like *Tetris 99*) in addition to classic games from vintage consoles and new downloadable content from new first-party releases (like we've seen recently with *Animal Crossing* and *Mario Kart*). And all gratis, depending on the subscription tier involved. We mention it because for many users NSO is already an essential service, one that will continuously deepen their

⁶ Playing *Breath of the Wild* was like stepping into a time portal that transported me back to when I first fell in love with the *Zelda* series, and Nintendo games in general. I suspect countless other middle-aged guys out there who were recently reacquainted with Nintendo felt much the same way.

⁷ For example, see the rumored "console-in-a-controller" peripheral we discuss in Appendix 3.

connection to the Switch platform as more Nintendo games include online components and new games and content are added to the service in time. That virtuous feedback loop should increase engagement while decreasing churn, resulting in a one-of-a-kind sustainable gaming platform armed with a much more durable and valuable installed user base.

The “essentialness” of NSO can be seen by its 34% attach rate this soon after its debut. That’s an impressive uptake given the still generally bare-bones nature of the service relative to what it will look like at maturity. In fact, if you compare the growth rate of the Switch platform’s installed base to the number of NSO subscribers since inception, it’s clear that the customer base is exhibiting a negative churn rate, a highly prized characteristic for software businesses. This phenomenon is likely driven by holdout Switch owners recognizing the value of the Nintendo Switch Online subscription service and belatedly deciding to join up, on top of growth in subscriptions tied to Switch console sales.

NSO’s increasing penetration makes intuitive sense. After all, by the time NSO reaches maturity it will boast the largest library of classic games ever assembled – games that, for the most part, aren’t available anywhere else, and that were created by Nintendo, the single greatest videogame developer of all time. In fact, we think Nintendo might have added upwards of 15m new NSO subscribers since its latest disclosures from November of last year. If that sounds too high, remember that Nintendo brilliantly decided to bundle new DLC into NSO’s first higher-priced subscription tier (the N64 Expansion Pack). In other words, by leveraging new DLC from *Animal Crossing: New Horizons* and *Mario Kart 8 Deluxe (MK8D)* – games that boast Nintendo’s two largest and most active player bases – NSO should see a durable step-change increase in not just its attach rate, but also its ARPU alongside a permanent increase in user engagement – and engagement stability is essential to any true platform.

Nintendo’s recently-released *Mario Kart* DLC shows just how much of a membership booster this new DLC should be. Nintendo is offering 48 new *MK8D* racetracks through fiscal 2024, to be released in six packs of eight tracks apiece. The roughly 44m people who have purchased *MK8D* to date can buy them for \$25 per pack – or they can get **all six free of charge** by subscribing to NSO’s N64 Expansion Pack at \$50 per year. For obvious reasons, this bundling strategy transforms NSO’s new higher-priced subscription tier from a luxury purchase to a “must have” for *Mario Kart* fans – and the impact on Nintendo’s bottom line should be enormous.

For example, if we assume an attach rate for this new DLC of 20% across the two games’ combined user bases (44m for *MK8D* and roughly 38m for *AC*) – a reasonable

assumption based on the loyalty of each entry's fanbase – then that adds 16.4m new top-tier subscriptions at \$50 each. That's a membership increase of up to 50% (depending on how many new top-tier subscribers already had base-level subscriptions) in one fell swoop, at **more than twice** the ARPU of NSO's lowest-cost tier. Better yet, the incremental operating profit attributable to NSO going forward would surge by as much as \$820m a year – a huge chunk of recurring, pure-margin revenue (i.e. profit) created by Nintendo seemingly out of thin air.

Most interesting of all, this move is likely the first stage of a larger game plan in which Nintendo bundles new DLC to reliably grow both the overall subscriber count and NSO's ARPU to a level that at least reaches parity with what its console peers charge. We suspect Nintendo's next tier will likely offer free DLC related to upcoming sequels to its biggest franchises of all, namely The Legend of Zelda, Pokémon, and Super Mario, along with access to more classic games and vintage consoles. If we had to guess, we'd say the next tier will offer games for the Wii, GameCube, GameBoy, and DS eras, and perhaps another classic third-party console, as Nintendo did recently with the Sega Genesis.⁸

The reality is that the number and power of the monetization levers available to Nintendo as it continues to layer on new games and features remains far in excess of what investors today currently appreciate. In fact, the latent pricing power embedded within NSO alone could materially move the needle on revenue and profit for Nintendo, given the monthly cost of its highest-priced subscription is less than half of what Sony and Microsoft charge for similar services. And Nintendo isn't resting on its laurels either, as continued success on this front remains critical to its larger ambitions. Not only does NSO reinforce the whole integrated hardware-software model at its foundation, it lets Nintendo build critical scale in R&D and proprietary content production, improving the service's value proposition in a formulaic and predictable manner that should drive reliable, durable growth in NSO's subscriber base (and ARPU) over time.

In summary, as Nintendo continues to thoughtfully expand its product portfolio and properly leverage its loyal base of global customers via a sticky ecosystem of software and online services, the strength of its already substantial "lock-in" with its users will only increase.

That stronger "lock-in" brings us to the next crucial insight we need our investors to understand: **Perhaps the most important aspect of Nintendo's ongoing business**

⁸ As of March 16th, 2022, the online shopping channels for the Wii and DS consoles were shut down, making it impossible for users to access either shop and redownload games they purchased in the past, an action they first gave public notice about all the way back in 2019. Between the upcoming release of Switch Sports and Nintendo's decision to shut down the legacy Wii and DS shops, the Wii Expansion Pack might be coming sooner than most seem to think.

model transformation is that its relationship with its customers is no longer based on a hardware device, but on a Nintendo Account that persists across multiple devices over time. That may sound strange to those who have come to view gaming solely through the now-obsolete “hit driven” paradigm of the past, but it’s a natural and entirely predictable strategic development for Nintendo.

In fact, while Nintendo’s management has long been known for vague, noncommittal statements, it’s been refreshingly direct on its commitment to this approach: It recently set forth “Nintendo Accounts” as its new basis for user engagement and announced a roughly \$4bn investment in network infrastructure and other online (software-based) service initiatives aimed at materially improving the cloud-based, Nintendo Account-centered experience.⁹ So make no mistake, Nintendo is now a customer account-centered company. That means the company’s direct relationships with its users are no longer at risk of ending when a new Switch family console comes out. They’re for life.

4. Mobile cost and innovation curves: The secret that makes the Apple Model work

We’ve talked about how Nintendo, like Apple, launches frequent incremental upgrades to the Switch, and how it ensures users stay “locked in” to the platform so they buy those upgrades. But you might be wondering how Nintendo can create all those wonderful new Switch models at affordable prices. For example, how could it launch a powerful new Switch “Pro” at a price identical to that of the recently released OLED model – and not much higher than that of the original Switch that debuted way back in 2017?

a. Reliance on “off-the-shelf” mobile device components

The answer is that the Switch, unlike past Nintendo consoles (but very much like Apple iOS devices), relies mostly on “off-the-shelf” mobile device components instead of highly specialized custom parts. This distinction is essential to the Apple Model, as it lets Nintendo and Apple ride the mobile cost curve downward, benefiting from the industry’s technological innovations and massive R&D budgets along the way.

Recall that the original Switch was built essentially from 2013-era mobile technology. Naturally, what’s possible today at a given price point is far, far beyond what was possible then. That means a Switch “Pro” could offer users a vastly enhanced

⁹ This investment is over and above its ordinary R&D expenditures. For more information on Nintendo’s upcoming investment in online infrastructure and other areas, see the company’s November 5th, 2021 investor presentation at <https://www.nintendo.co.jp/ir/pdf/2021/211105e.pdf>

experience for not much more money, much as is the case with consumer electronics more generally. (For example, a 65-inch flatscreen TV can be purchased today for a fraction of the cost of a TV of similar features and quality ten years ago.)¹⁰

Additionally, the price of older models should drop alongside a larger family refresh six to twelve months after the Pro's launch, boosting unit sales without affecting unit-level margins, and further expanding the Switch family's installed base.

This “exploit tech progress, expand the product portfolio (at an increasing array of price points), grow the user base” strategy is all straight out of Apple's playbook. For example, almost a decade after the release of the original iPhone, Apple was able to launch the much more compact and more technologically advanced Series 3 Apple Watch at a significantly lower price point. A device like that, at such a low price, would have been simply unimaginable in the mid-2000s when the iPhone was conceived and launched. However, not even a decade later, the technological progress of the vast mobile industry made it possible. So by building its Switch devices from more or less generic components, Nintendo is once again simply following Apple's well-worn path to platform success.

b. Ensuring intergenerational hardware-software compatibility

Saving money on generic components is all well and good, you may be thinking, but how can Nintendo have old Switches play new, more resource-intensive games, while also managing to have its new, more powerful Switches play older games programmed to run on increasingly-obsolete hardware?

The solution is simple and elegant: Going forward, as the technological gap between the oldest and newest Switches widens, **older Switches will run new games both natively and online via the cloud, while newer, more powerful Switches (like the Pro) will run older games natively and through emulation.** This isn't mere speculation on our part. Several high-powered third-party Switch games (including Marvel's *Guardians of the Galaxy*, Ubisoft's *Assassins Creed*, and Capcom's *Resident Evil*) already run in the cloud, while every classic NES, SNES, and N64 game available on NSO today runs on current Switches via emulation.

In fact, of all the points we make in this update, what we're going to discuss next is arguably one of, if not the most important: **The Switch's OS was built hand-in-hand with Nvidia, and its NVN API was custom-developed for scalability as well as compatibility across form factors and generations.** It also supports several

¹⁰ Stratechery.com's Ben Thompson has spoken eloquently for many years on how the smartphone-driven evolution of “systems-on-a-chip” and screen technology should result in portable devices like the Switch ultimately challenging home consoles in terms of technical specs and raw horsepower, a viewpoint that would have been considered bonkers 10 to 15 years ago.

common ways to program, boasting compatibility with Vulkan, OpenGL, and other common graphics API standards. While few investors seem to understand (let alone properly appreciate) this fact, Nvidia has confirmed in various company materials and discussions with investors that Nvidia’s “Jetson”-platform GPUs from Maxwell to Pascal to Orin are all compatible with the same APIs even though they use different hardware architecture. **Consequently, existing first- and third-party software will have no problem running natively on the Switch Pro.**

And while some in the industry have claimed that Switch games’ use of Maxwell GPU drivers will make backwards compatibility difficult because, they say, translating games to a newer, non-Maxwell based GPU won’t be possible unless the individual developer decides to patch these games after the fact. However, such claims are nonsense: The Pro’s new Nvidia “system on a chip” will be able to easily run Maxwell-optimized software (such as operating systems and APIs).

There are also understandable concerns that existing Tegra-based Switch devices won’t be able to play newer third-party games that require more powerful hardware. (We emphasize third-party because most users today bought a Switch to play Nintendo games, and forward and backward compatibility on first-party releases is not in doubt.) While it’s true that some new non-cloud third-party games may require minor tweaks to run on older hardware, the return on those efforts will be enormous given the size of the Switch family’s installed base.

Keep in mind too that creating great, power-hungry, hardware-agnostic games for all platforms simultaneously, has never been easier for third-party game developers. As we’ll explain below, this is due to at least three factors: (1) the rise of cloud gaming, (2) the rapid adoption of new technologies using AI and other methods to significantly improve the performance of software running on older hardware, and (3) the rise of third-party game development platforms.

i. Cloud gaming

First, the rise of cloud gaming means that industry players in the game development space today increasingly run games remotely off a server, effectively offloading the processing burden so that older hardware can play newer games despite being technologically obsolete (strictly speaking). This is a well understood phenomenon, so we won’t spend much time on it here.

ii. New technologies

Next, on the new technology front, look no farther than AMD’s FidelityFX Super Resolution (FSR). FSR is essentially AMD’s answer to Nvidia’s DLSS 2.0 and the

rapid rollout of FSR across Nintendo’s entire library of first-party games appears assured at this point. For example, analysis of Switch OS metadata confirms that it’s already been integrated into AGL, one of Nintendo’s core graphics libraries used in a variety of its top-selling games. As a result, FSR can be retroactively “turned on” in all Nintendo games that use the AGL library, not just the imminent release of *Switch Sports*, the game the application of FSR was first noticed on. Hit titles like *Super Mario Odyssey*, *Legend of Zelda: Breath of the Wild*, *Animal Crossing: New Horizons*, and *Splatoon*.

It’s easy to understand why Nintendo – or any developer with IP on the Switch platform – would do this. After all, FSR’s graphics and performance impact, in terms of frame rates and resolution, is substantial. And FSR, by design, is hardware agnostic, so it can be enabled globally across any game with an ordinary, run-of-the-mill software update. Which is to say that FSR can be implemented retroactively in not just Nintendo’s own first-party Switch games, but all third-party Switch games, too – and rather quickly, assuming third-party developers choose to do so. (We think they will, given not just the improvements to the user experience, but the considerable financial benefits associated with the size of Nintendo’s 100mn strong installed base).

In fact, third-party developers for the Switch have already begun implementing FSR. Deck Nine Games heavily relied on FSR technology in the creation of their *Life is Strange: True Colors* game.¹¹ Incredibly, the game is no bare-bones Switch port, but rather a fully-featured version of the game, with completely faithful gameplay and visuals comparable to those of versions for other, more powerful platforms. And shortly before this letters release, AMD announced that Microsoft will be integrating its latest version of FSR into the Series X so its game developers can start making use of this framerate-improving technology from day one. This preview offers us a sneak peek of what’s to come and that’s exciting, to say the least.

Finally, implementing FSR is a hugely consumer-friendly move, in that it costs Switch users nothing. In other words, it essentially gives the Switch’s entire active user base a free hardware upgrade. So while AMD’s answer to Nvidia’s DLSS 2.0 is not as transformational as DLSS (e.g. it won’t upscale games to 4K), it’s the next best thing thanks to FSR’s ability to take low-resolution frames and run them through a special edge-enhancement upscaling algorithm that results in visuals that appear notably sharper and higher-resolution than they otherwise would be.

In summary, the implementation of FSR, by design, can be easily enabled globally for any game via a very Apple like software update. And the application of this type of technology is a game changer for older Switch devices, as FSR will allow Tegra-based

¹¹ See https://square-enix-games.com/en_GB/news/life-is-strange-true-colors-switch?utm_campaign=mobile_none-other_SQEXSOCIAL

Switch hardware to receive a major upgrade without paying for one. And that has significant implications for the useful life of Nintendo's older hardware. After all, the technology helps ensure older Switch hardware will be better able to properly run both older and newer, more advanced "next-gen" games. An exciting new development we didn't see coming, but rest assured we appreciate.

iii. Third-party game development engines

Finally, when it comes to the rise of third-party game development engines, we'll defer to Punchcardtrader's VIC thesis quoted earlier on to explain why it's a similar case (emphasis ours):

The gaming industry has been rapidly adopting third-party game development engines such as Unreal and Unity and these game engines abstract away the hardware layer. **This means that it is much, much easier for game developers to develop for multiple platforms at the same time.** Historically, each console platform had its own game development engine and game developers needed to choose which platform to publish on. In practice, this meant that the console that gained the most traction would take outsized rewards. **Today, game developers find it much easier to develop and/or port games over to different platforms.** Consequently, cross-platform play is becoming more commonplace. **The direct outcome is that Nintendo Switch is becoming much more friendly to third-party game developers.** As the library of third-party games on Switch expands, the Switch's value proposition for the gamer base is rapidly expanding. Furthermore, as the content overlap between the three console platforms overlap, Nintendo increasingly has a credible point of differentiation with its exclusive game franchises.

The takeaway is that "tweaking" new games to ensure compatibility with older hardware is several orders of magnitude easier today than it's ever been before as publishers have been able to perfect the production line model of game development. Or to say the same thing in a slightly different way, with the hardware layer increasingly abstracted away, game developers can optimize for cross gen compatibility with Switch games from the start, and without much effort¹² – in exactly the same way they do when they make differing versions of the same game for the PS4 and PS5 today. And again, given the size of Nintendo's installed base, not to

¹² As a quick aside, we should mention that the rapidly growing support for the Switch platform from third-party game developers is about more than simply the rise of game development platforms like Unity and Unreal. Nintendo has done plenty in its efforts to better court third-party devs to the platform this time around, whether by creating the Nintendo Developer Portal, offering affordable dev kits, or allowing individuals to self-publish through its eShop. Its recent multi-billion-dollar network investment and the release of more powerful hardware early next year are two other powerful examples of Nintendo upping its game in this regard.

mention the material improvements to individual game resolutions and frame rates from technologies like FSR, the monetary and quality-related incentives to make those tweaks are considerable.

So while there will be some newer games developed exclusively for the Pro as an enticement to upgrade, these titles will almost certainly be few and far between (as we saw most recently with Nintendo's 3DS portable console). And as we discussed earlier on with Apple's "planned obsolescence", some fragmentation is a good thing, as it helps ensure a basic level of replacement demand by inducing users to trade up to newer models in time.

We want to briefly touch on one last intergenerational compatibility-related point: Nintendo has historically *always* provided at least one generation of backward compatibility with its portable consoles. For example, the Gameboy Advance was backward compatible with the Gameboy and Gameboy Color. Furthermore, the DS was backward compatible with the Gameboy Advance, and the 3DS was backward compatible with the DS. On the home console side, the Wii was backward compatible with the GameCube and the Wii-U was backward compatible with the Wii. We're sure you get the point, but the historical fact pattern here clearly shows how Nintendo feels about ensuring intergenerational compatibility.

The bottom line is that Nintendo is going with the same hardware strategy as Apple: It's minimizing the cyclical nature inherent with hardware changeovers by releasing more powerful devices every few years that boast new and exciting features, but that remain fully compatible with all existing software. This means that Nintendo users won't have to "start over" with their software libraries each time they upgrade to the latest Switch. Rather, they can enjoy all the software that's already been released while also benefiting from the speed, power, and other advantages of new Switch family hardware.

But you don't have to take our word for it. As Nintendo's Technology Development Division head Ko Shiotani has said, "We have to make sure that all new software being released works properly on the hardware, no matter what hardware version." That statement appears on Nintendo's own website.¹³ We think Nintendo put it there to send a clear signal to users (and investors!) that the Switch is here to stay.

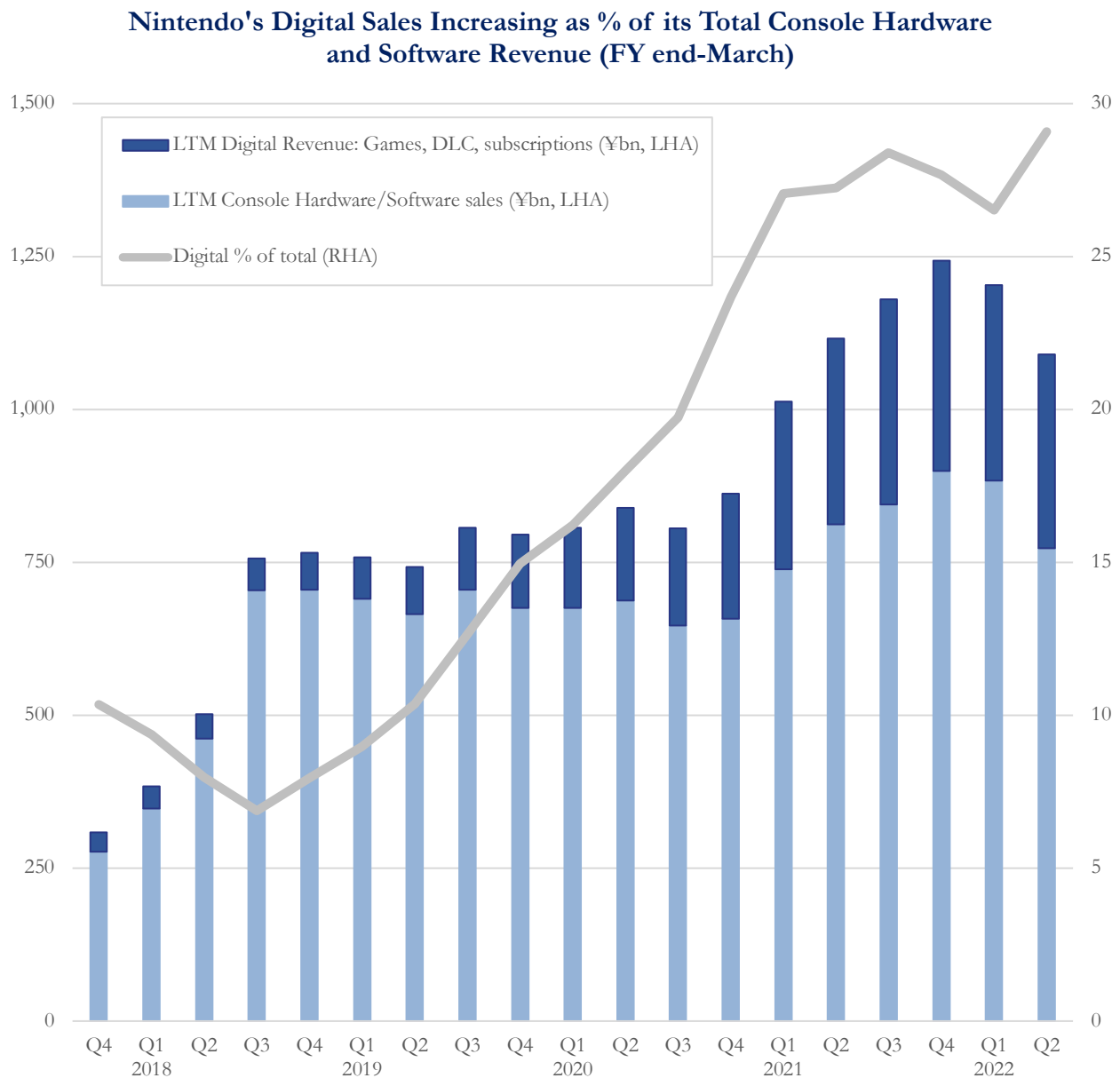
C. Digitization of sales

The Apple Model isn't just about getting users to buy your hardware; it's about getting them to buy your software too. And it does that by making that software easily available via digital download. Think about it: Have you ever walked into a brick-and-

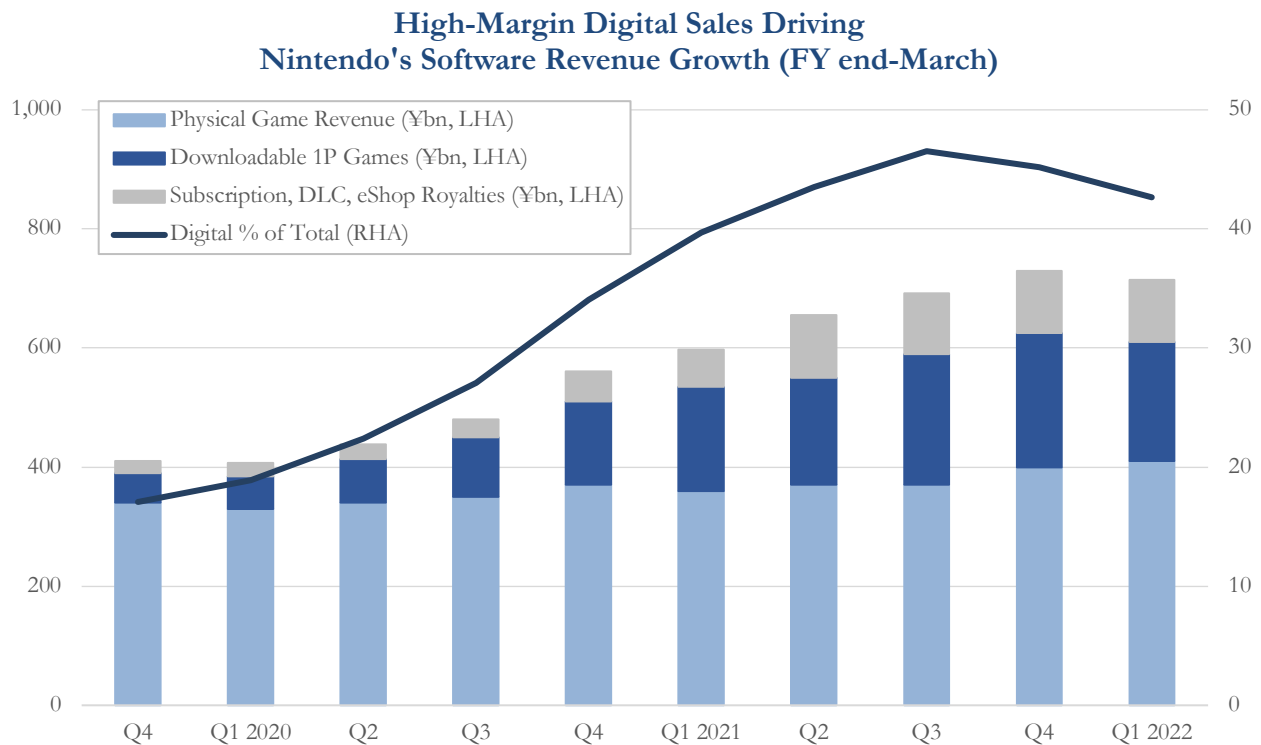
¹³ <https://www.nintendo.com/whatsnew/detail/2021/ask-the-developer-vol-2-nintendo-switch-oled-model-part-1/>

mortar retailer to buy a new app for your iPhone? And yet even today, many consumers still buy new videogames stored on tangible physical media, whether off the shelves at retailers like Best Buy, or via the websites of companies like Amazon.

We'll discuss the minutiae later on in the valuation section, but for now, just note that Nintendo has been actively working to eliminate this outdated retail model for the benefit of all its stakeholders. As the chart below shows, digital sales are rapidly growing in every segment:



Critically, Nintendo's extremely high incremental margin digital sales are also growing as a percentage of Nintendo's total software revenue:



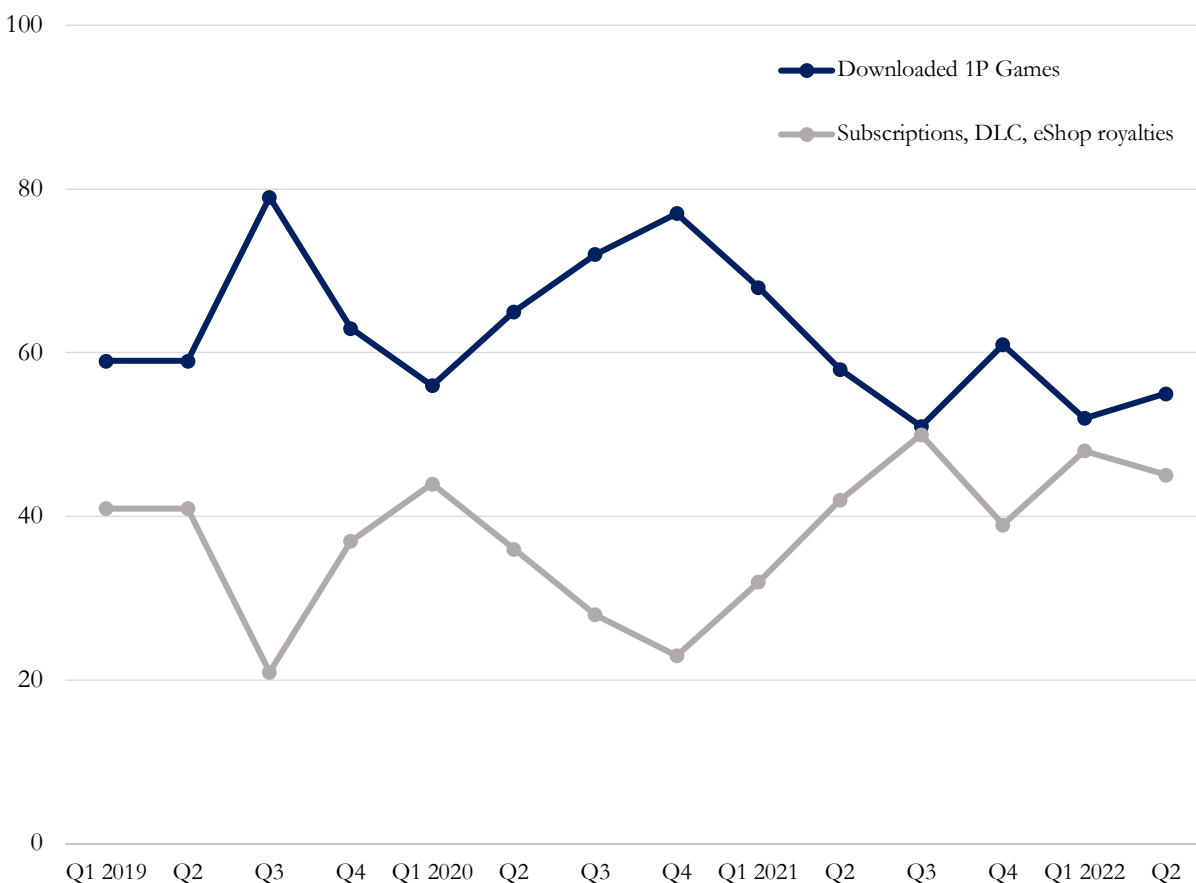
And this transformational change isn't limited to the ongoing physical-to-digital mix shift in Nintendo's packaged game sales. It's happening across all of Nintendo's digital drivers, including its sales from online services, in-game items and DLC.

In other words, the trend toward digital distribution affects not just one-off sales of new games, but also the recurring, high incremental margin revenue from (1) subscriptions to online services like NSO, (2) in-game item sales, such as race car upgrades in *Mario Kart Tour* (Nintendo's smartphone version of Mario Kart), and (3) downloadable content (DLC, i.e. content purchased online separately from the game in which it's used) that typically comes in the form of "season passes" for free-to-play, perpetual live service games like Epic's *Fortnight*, or "character packs" like those offered by Nintendo for its global fighting blockbuster, *Super Smash Brothers Ultimate*.

And as we've touched on before, the rise of the Internet and the ubiquitous nature of online game play today has made it possible for videogame creators like Nintendo to constantly update their games to keep players engaged, which gives them ample opportunity to sell their customers various in-game items long after the initial

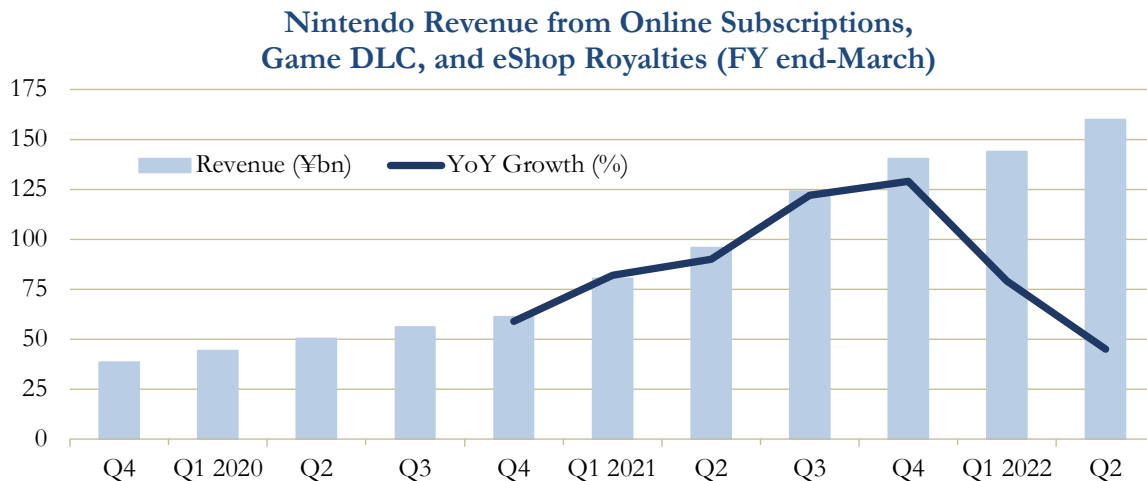
purchase. Consequently, these drivers collectively now let Nintendo generate highly consistent, virtually pure-profit, digital revenue in a manner that simply wasn't possible fifteen, or even ten years ago. And it's not just Nintendo that's won, as new subscriptions, DLC and in game item sales keep its active userbase deeply engaged with highly immersive forms of content that candidly gives consumers way more bang for their buck relative to competing forms of media and non-Nintendo games.

Nintendo Digital Revenue Component Mix (% , FY end-March)

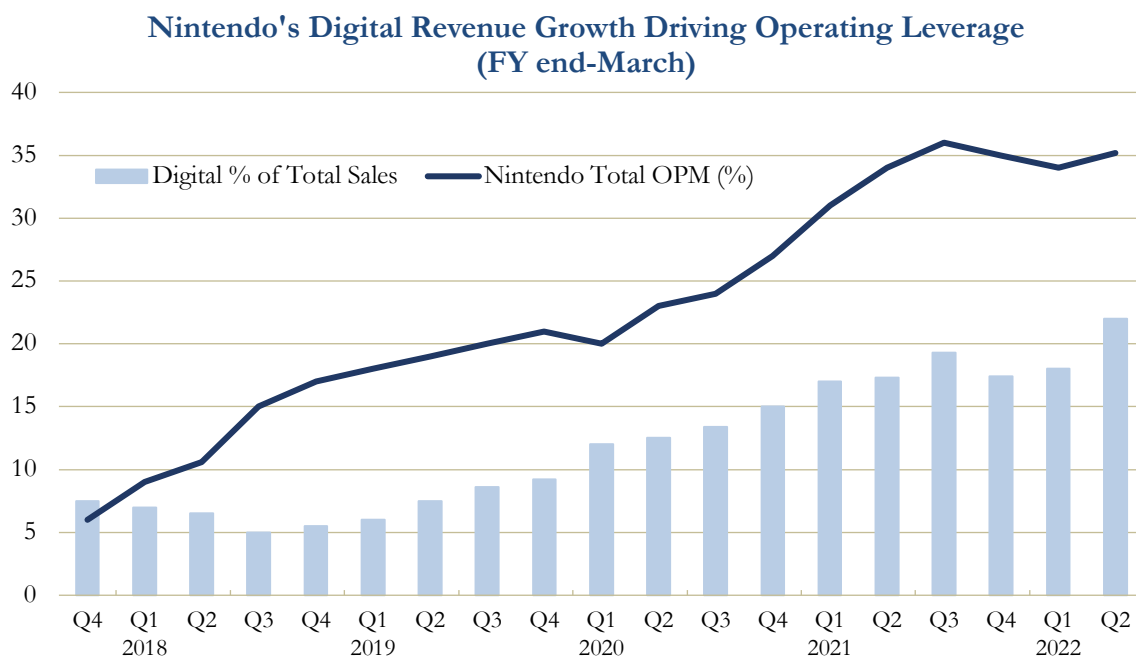


As the chart above illustrates, high-margin digital segment revenues are currently split more or less evenly between (1) downloaded first-party games and (2) NSO subscriptions, DLC, and eShop royalties. **In fact, the highest-margin subset of the highest-margin business that Nintendo has is also growing the fastest.**

How fast is the digital proportion of Nintendo's sales mix growing? While the pace has slowed, Nintendo's highest-margin niche is still growing exceptionally well at 31.2% YoY despite already approaching a leviathan \$2.9bn in total sales last year:



And the impact of these high-margin, recurring revenue hyper-growth segments cannot be overstated. Over the last 16 quarters, they have consistently made up a larger and larger portion of Nintendo's revenue, resulting in a **26% increase in operating margin from just a 14% increase in digital sales as a percentage of total sales**:



Yet the market has simply not priced in this secular megatrend, despite Nintendo's proportion of digital sales growing massively over the last few years. And that's particularly remarkable given that company's ongoing shift to digital is not only inevitable, but barely halfway complete. Indeed, as we'll discuss in the valuation section, the secular trend away from physical distribution of software toward an essentially all-digital future is a matter of when, not if, it comes to pass.

In the end, we think it's hard to imagine digital ending up as less than two thirds of Nintendo's total sales, considering the phasing out of physical media in nearly all forms and the fact that Nintendo's console and pure software peers are already there.¹⁴ Of course we also hammer this point home because the implications of this ongoing shift for Nintendo's steady-state profitability over the next five to ten years are jaw-dropping. (We run through the economic implications in detail later in this letter, and trust us, it'll be worth the wait.)

Before we go, consider that the digital components of Nintendo's sales have best-in-class SaaS-like margins and unit economics. And that might be understating the case, given that there aren't many profitable, wide-moat SaaS businesses on earth with a fast-growing, largely recurring, low-churn revenue base. And there are even fewer that require relatively low levels of tangible capital to scale or sport 90% gross margins (like NSO for example) and operating margins over 50% at maturity – as Nintendo will once its transformation is complete.

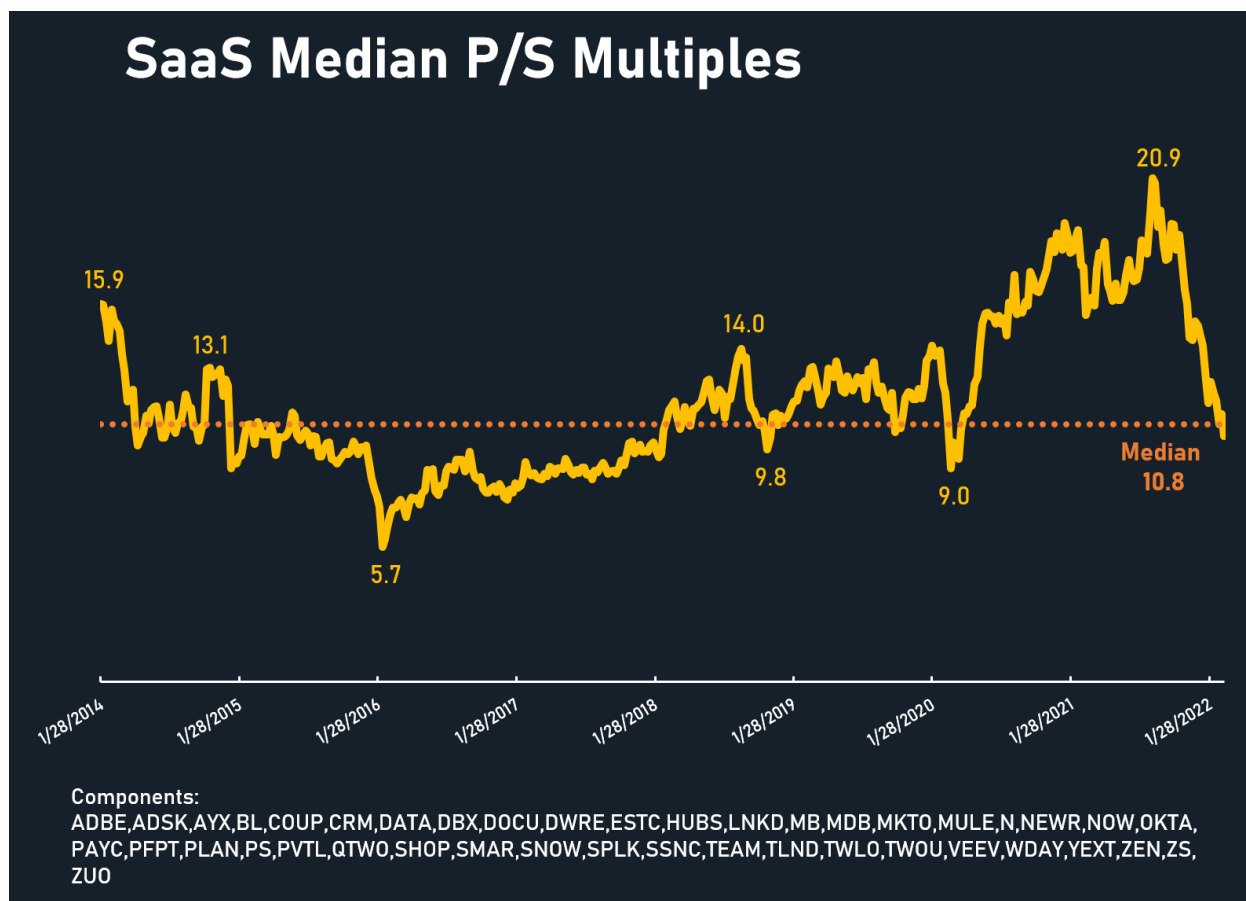
Better still, if we were to apply the 10.8x median market multiple of SaaS companies (with inferior economics and growth rates) as shown in the chart on the next page,¹⁵ **Nintendo's digital segment alone could be worth more than 50% of the company's market capitalization today,¹⁶ or roughly \$31bn based on fiscal 2021's numbers.**

Add in Nintendo's \$13bn or so in cash and the value of its non-core, long-term equity stakes, and we're literally getting paid to own the rest of Nintendo's business for free. And this exercise is even more eye-opening if we use the median multiples for top quartile SaaS businesses and reasonable estimates based on Nintendo's fiscal 2023 (i.e. calendar year 2022). All of which is simply another way to highlight that Nintendo, at or around the current quote, remains dirt cheap.

¹⁴ For example, the digital mix of Sony's game and network division's total sales was approximately two-thirds digital as of its most recent quarter.

¹⁵ <https://twitter.com/MarceloPLima/status/1501253582087090182?s=20&t=FCB2EJFyRd9c9xsGDCm5nw>

¹⁶ Nintendo's market cap and enterprise value at the time of this writing were approximately \$55bn and \$41bn, respectively.



D. Is the Apple Model working for Nintendo so far? Yes!

Above, we've explained how Nintendo has been following in Apple's footsteps by launching various new Switch family devices. But doing what worked for somebody else doesn't mean it'll work for you. So is the Apple Model working for Nintendo? Have Nintendo's releases of iteratively-improved, intergenerationally-compatible Switch devices given the company a "permanent" locked-in user base? The answer at this point appears to be yes.

Just look at Nintendo's first significant new form factor, the "portable only" Switch Lite. As we predicted, with the debut of the Lite in late 2019, the original Switch console became part of a "family of systems" accessing the same software-based ecosystem. Moreover, the Lite was snapped up by budget-conscious consumers for whom the original Switch was too expensive. And while original Switch buyers tended to be male, Lite buyers skewed female, adding more women to Nintendo's user base. Finally, in another very Apple-like move, the Lite paved the way for deepening Nintendo's product penetration per household by appealing to existing Switch owners who wanted a cheaper one for the kids, or one with improved durability and battery life to take on the road. So the Lite didn't cannibalize sales of the original Switch; it

supplemented them. And by keeping old users on board while adding new ones, it expanded the Switch family user base.

But Nintendo in 2019 didn't release just the Lite. It also released an upgraded version of the original switch with minor incremental improvements thanks to a slightly more efficient chipset. This improved version showed that Nintendo was not just launching new Switches to target different types of users as with the Lite (as Apple does with the iPhone 13 and 13 Pro Max), but also to induce users to *upgrade* to the latest and greatest version of their preferred model (as Apple does with the iPhone 13 replacing the iPhone 12).

Of course, the OLED Switch is another example of the “latest and greatest” version designed to get dedicated users to upgrade. While Nintendo noted in its earnings release in November that sales trends indicated that users who purchased an original Switch five years ago were interested in replacing it with the OLED, management disclosed in February that the OLED is being purchased as both a replacement system *and* as an additional system, creating new demand in its wake. Regardless, since its launch last October, the OLED model still remains relatively hard for consumers to get their hands on – and that strongly suggests it's a hit, as does it selling about 4m units in its first quarter despite significant production capacity-related constraints.

Taken together, the releases of the Lite, an incrementally improved original Switch, and an OLED model have definitively validated our long-running thesis that Nintendo would start down the path of iterative hardware upgrades that maintain compatibility with prior models. But wait, there's more! In another sign that the Apple Model is working for Nintendo, the company has stopped supporting and developing non-Switch devices and games. Specifically, in late 2020, Nintendo announced that it was pulling the plug on all further development of 3DS hardware and games. The handheld 3DS had long filled a niche for Nintendo as a low-priced portable game system, but with the launch of the Switch Lite, its days were numbered. And with the 3DS out to pasture, Nintendo no longer needs to maintain parallel development processes for portable and home-based hardware and games. Instead, it can now consolidate and focus all development resources on a single, unified platform: the Switch.

In other words, with the discontinuation of the 3DS, Nintendo's flagship portable and home devices are now iterations of the same integrated hardware and software platform. That's a first. As a result, Nintendo will not just be more operationally efficient, it should be able to leverage its software development assets more effectively. That means we should start to see an increase in the number of first-party games it can release in an average year. That's no small thing, if only because the primary driver of Nintendo's earnings today is the sale of new games.

Which brings us to our next point: We expect Nintendo’s next step in the Switch family’s iterative improvement process will be the unveiling of a high-end Switch “Pro” in the first quarter of 2023 (i.e., Nintendo’s Q4 in fiscal 2023). This will be the first major (as opposed to incremental) upgrade since the original Switch debuted, and should kick off a massive, multi-year replacement cycle, while materially expanding the Switch family’s TAM. **This event will also mark a definitive inflection point for Nintendo, as it will demonstrate, once and for all, that the release of “next gen” hardware will not create a “breaking point” for its user base as it has in prior eras. After all, the implications of a successful Apple-style transition simply can’t be credibly denied once Nintendo gets past that point.**

Besides burying the hit-driven cyclical narrative for good, we should quickly mention that we’re hard pressed to imagine a better way to attract the “hardcore” gamer cohort than a portable gaming system roughly four to eight times more powerful than current Switch family devices. Indeed, one of the key reasons we believe the Pro should result in a cascade of value-enhancing changes across the company and its customer base over the next few years is that Nintendo plans to spend the majority of its recently-announced \$4bn in new investment (above and beyond ordinary R&D) on online network infrastructure and new software. That just wouldn’t be necessary if the Switch weren’t getting a substantial upgrade like the one that took place at Nintendo’s console maker peers when they took a similar tack over a decade ago.¹⁷

But stay with us. The real beauty of the Pro in combination with Nintendo’s recent investments is that it will finally let the big N offer both players and developers not just hardware capable of supporting games from “next gen” consoles like the PS5 and Xbox Series X, but state-of-the-art technical infrastructure capable of delivering world-class online gameplay. All this should help turn the Switch platform’s already-robust third-party development pipeline into a gusher next year. That’s not just because of the Switch platform’s still-growing 100m-plus user base (although we have little doubt third-party developer interest will remain strong on that basis alone), but because it lets Nintendo do what it’s never done before: deliver truly faithful renditions of titles from high-powered, long-tailed AAA multiplatform franchises like *Call of Duty* and *Madden*, as well as popular persistent game worlds like *Fortnight* and *Minecraft*, on a dedicated **portable** gaming console.

We repeat: Between the Pro’s improved functionality, and Nintendo’s beefed-up technical infrastructure and online service expertise, competitive gamers will be able to play high-powered games exactly as they were intended to be played – and not just

¹⁷ And this move would be even less comprehensible if the Switch family was a mere year or two away from retirement, as its current valuation seems to suggest.

at home, but “on the go” with dedicated controls, for the first time in history.¹⁸ That’s a big deal. It should help Nintendo not just massively increase user engagement (and thus profit per user), but sell tens of millions of Switch Pros out of the gate.

But more than that, investors should consider the long-term implications of Nintendo breaking onto the scene with current-generation-equivalent hardware. In other words, what happens to the forward prospects of Nintendo when the only gaming platform, with truly differentiated IP reaches or surpasses technological parity with those from Sony and Microsoft?

We don’t have a crystal ball, but we know one thing for sure: The Switch platform will finally have a credible point of differentiation with its proprietary game franchises alongside its newly superior hardware. Yes, as a home and portable console in one, the Switch platform was already differentiated, and the same is true in the way it unlocks various forms of unique, interactive gameplay (its table-top mode being a good example), but once Nintendo is playing with power, everything changes.

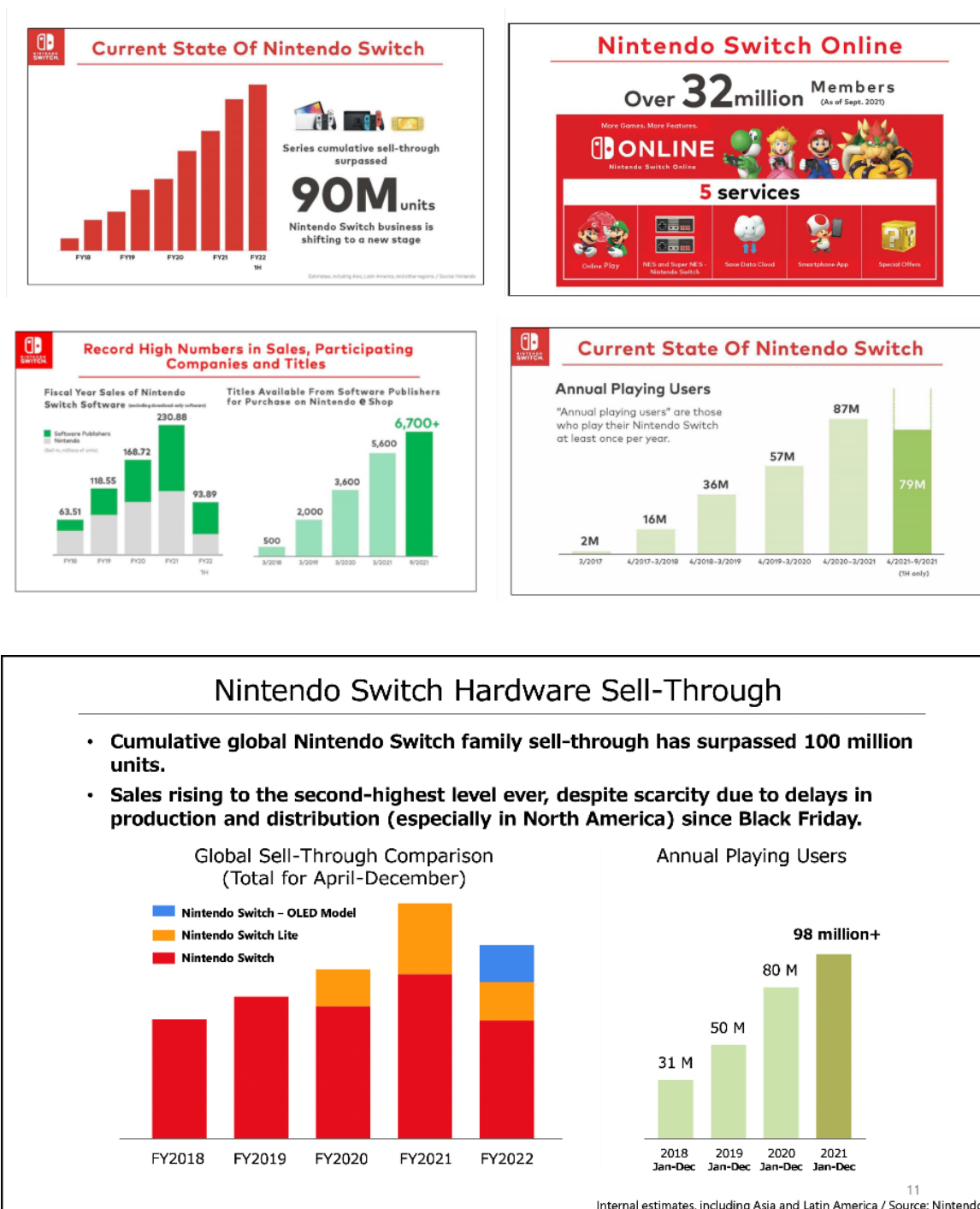
We’re not dreaming of Shangri-La here either. Once hardcore gamers realize they can own a portable PS5-equivalent console that’s not only cheaper but also plays faithful renditions of the same high-powered games they love (and Nintendo’s too!), then it’ll be a genuine no-brainer for them to have at least one active Switch Pro in their home.¹⁹

All this brings us to another key set of data points when it comes to judging whether Nintendo’s embrace of the Apple Model is working. Indeed, one of the defining traits of the “Apple Model” is not just highly differentiated hardware, but the healthy and continuously growing ecosystem of software and services built on top of it. For example, while it’s nice that the installed base of iPhones has grown every year for 15 years running, it’s crucially important for Apple that the number of apps in its App Store has done the same.

¹⁸ This was technically true prior to the recent release of Valve’s Steam Deck, but we’d argue the Steam Deck is inferior in several key ways, and for various reasons (mentioned in Appendix 2) won’t hold a candle to what Nintendo will soon release.

¹⁹ Humor us, but in a world where the law of diminishing returns is already making the difference between the high-powered consoles of Nintendo’s peers increasingly marginal, to the point that telling the difference between 8th and 9th gen games on Sony or Microsoft systems is often impossible, where do gamers go once the big N catches up in terms of raw horsepower? PCs are a fair answer, but at minimum the competitive landscape in console gaming should shift meaningfully in Nintendo’s favor.

So how has Nintendo been doing? Below are five slides from the last two quarters that get straight to the heart of the matter:



Is it really a coincidence that Nintendo is hammering home all the KPIs at the heart of a durable, Apple-like ecosystem? How about the fact that – again, just like Apple –

the number of first- and third-party software titles and online services available in its eShop not only continues to grow, but has grown every year for five years running? And lest we forget, user engagement on the platform is sitting at all-time highs. So by traditional measures, we'd say Nintendo's ongoing transition to the Apple Model is doing just fine.

III. WHY THE BEARS ARE WRONG

Incredibly, the market still doesn't understand the long-term implications of Nintendo's ongoing business model transformation. Mind you, we could make sense of its dramatic undervaluation when our thesis was based on informed conjecture, but now it's based on objective fact: The hardware upgrades and expanding product portfolio that we envisioned years ago have played out pretty much exactly as we expected. The software ecosystem we praised hit exit velocity and continues to explode in size. And of course, the Switch family of devices – now a dominant five-year-old platform well on its way to becoming the single best-selling videogame console of all time – is showing no signs of heading for retirement.

Yet despite all those developments, investors continue to value Nintendo as if it's Nokia, rather than Apple. Indeed, the shares are pricing in another cyclical implosion for the console business despite zero evidence that any such implosion is in the cards. If you ask us, a high-ROIC, branded franchise like Nintendo, with a healthy and growing Apple-like proprietary hardware-software ecosystem and peerless gold-plated IP, should *never* trade at a high-single-digit multiple to current-year EBIT forecasts. Nonetheless, that's where Nintendo stands today.

And yet the market's wrongheadedness is somewhat understandable. People tend to stay anchored to long-held beliefs, whether about Nintendo or anything else, despite mountains of evidence to the contrary. Early in the last decade, large numbers of professional analysts and even industry titans managed to entirely miss the point on Apple. They ruminated about what Apple's next big "mega-hit" product would be, as if Apple's core business was akin to drilling wildcat oil wells in the Sahara. Apple, they believed, was simply a struggling maker of largely commoditized hardware whose best days lay behind it. Incredibly, Dell Computer CEO Michael Dell even called for Apple to close up shop and return its cash to shareholders, while *Business Insider's* Henry Blodget claimed "the iPhone is dead in the water" with a straight face. And amazingly, views like this remained commonplace more than five years *after* the iPhone's launch. Such is the burden of tearing down 20 years of Wall Street narrative that, despite overwhelming amounts of contradictory evidence, simply refuses to die.

So when will Nintendo investors wake up and smell the Apple-flavored coffee? Well, as just mentioned, Nintendo's new business model is approaching a key milestone: this year's release of the first major upgrade to the Switch family of devices. Once that happens, and Nintendo has successfully demonstrated its ability to weather major Switch upgrades without suffering the downturns in revenue and operating profit that have historically been characteristic of a standard console cycle, it will be obvious that the Switch family is indeed "forever." As a result, the flawed reasoning behind long-running bear narratives like "peak Switch" (see below) will finally be exposed, and the "hit-driven cyclical" label can finally be laid to rest.

Of course, if the market agreed with us, Nintendo wouldn't be so cheap. So what are some of the bear arguments out there? Below, we review four of the most common:

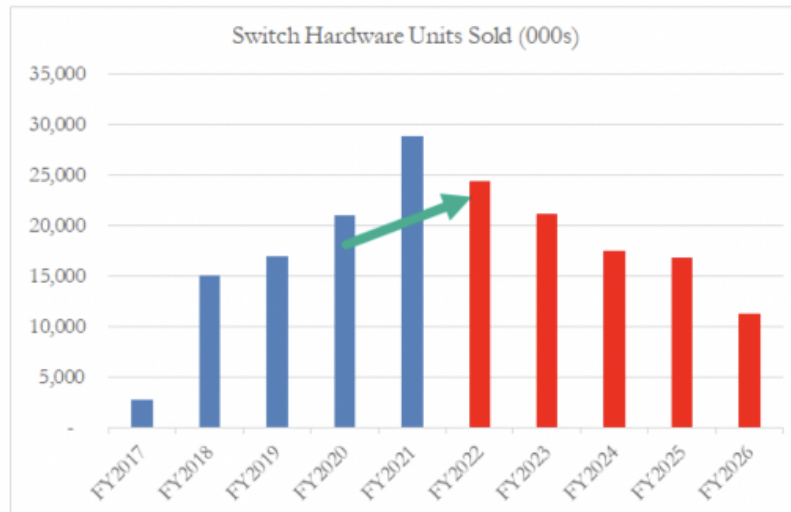
- (1) We've reached **"peak Switch"**, after which unit sales will inevitably decline.
- (2) Nintendo **loves creating new devices too much** to stick with the Switch in perpetuity as its only platform.
- (3) Nintendo is an **old-line Japanese company** and will just pile up Switch profits without investing for growth or rewarding shareholders.
- (4) The Switch isn't a true videogame platform because it **doesn't have enough third-party support**.

Spoiler alert: As you'll see, we don't think any of these arguments hold water.

A. "We've already reached 'peak Switch'"

Investors familiar with Nintendo won't require any introduction to the "peak Switch" narrative. As the story goes, Nintendo would never have put up the numbers it did last year absent one-off benefits associated with the COVID-19 pandemic, a period when most people were forced indoors and desperate for cheap entertainment.

While all that may be true to an extent, the idea that the pandemic was the primary driver of demand in 2020 – artificially extending Nintendo's hardware momentum in the last inning of its product cycle – is just as out of touch with the present reality as claims that Apple had reached "peak earnings" back in 2011. Alas, such abject nonsense remains the view of the majority on Wall Street. If you doubt that, consensus expectations for hardware are shown by the red bars in Ensemble Capital's wonderful "peak Switch" illustration below:



Source: Canalyst, Visible Alpha, and Ensemble Capital. Red bars = consensus forecast.

So what exactly is the “peak Switch” argument? Well, it holds that because of the pandemic-driven surge in sales alluded to above, Nintendo has sold a Switch to pretty much everybody who wanted one. Therefore, the narrative goes, the company now faces a sustained decline in console sales as standard “post-peak” console cycle dynamics reassert themselves. However, this is all just an ordinary market penetration argument dressed up in COVID clothing – and it’s wildly off base.

Yes, it’s true that Nintendo enjoyed higher-than-usual sales and profits in 2020, due in part to pandemic-related lockdowns and restrictions. And it’s true that 2021 year-on-year comps were challenging. But it’s incorrect to conclude that the Switch is an aging console headed for retirement, propped up for an extra year by a one-off pandemic-driven sales boost.

The fact is that it would have been virtually impossible for Nintendo to post YoY growth in 2021 because its 2020 results were off-the-charts extraordinary. The only surprising thing about Nintendo failing to surpass its 2020 comps in 2021 is the idea that anyone would be surprised by that in the first place.

Consider Nintendo’s 2021 results through Q3: After realizing that operating profit comped down YoY by just 9.3% against a period that saw not only pandemic lockdowns, but also the release of global phenomenon *Animal Crossing* (“AC”), our reaction wasn’t disappointment, but pride. We’re talking about a period in which AC sold a mind-bending 20m units, most of which were purchased digitally by necessity given that physical stores were literally closed. On the hardware side, recall that the primary driver of Nintendo’s console sales in any given quarter is the quality of its

software pipeline (i.e. the number of “system-selling” games launched). It follows that AC was responsible for a fair amount of 2020’s incremental console sales, too.

Factor in the lack of any “system-selling” blockbusters being released in the first three quarters of 2021, and the fact that same software sales of non-AC titles *grew* every month, in every quarter, through year-end, and Nintendo’s core business starts to look quite strong, despite facing what was its toughest comp set in its entire 13-decade history.

Again, if we zoom out and look at results through the holiday quarter, it becomes even more obvious just how much a single game – AC – drove the business in fiscal 2021 (essentially our FY 2020). Management noted that over 40% of Switch consoles purchased in the first half of FY 2021 were attributable to AC alone. And yet, excluding the one-off impact of AC, we see that comps through Q3 for both hardware *and* software were actually *up* YoY. In short, seen in the proper context, this was a remarkably strong result.

The takeaway is this: Once normalized for the unique factors underpinning fiscal 2022’s tough comps, the key trends supporting healthy, consistent growth in Nintendo’s core business remain firmly intact. And the same basic insight can be gleaned by comparing Nintendo’s FY 2022 results to its pre-pandemic performance. As the table below makes clear, Nintendo’s business in 2021 was operating at levels substantially above where it was two years ago:

Nintendo CAGRs (%), FY end-March 2019-2021	
Digital revenues	42.1
Hardware unit sales	30.8
Physical game unit sales	28.5
Mobile/IP revenue	17.0
Gross profit	18.7
Operating profit	52.3
Net income	65.8

So we don’t see calendar year 2021 as the beginning of a prolonged downturn for Nintendo. Rather, we think it’s more appropriate to view it as a return to the company’s long-established trend of steady, sustainable growth.

With all that in mind, let’s look more closely at Nintendo’s recent decision to bring down its FY 2022 hardware guidance to roughly 23m units, from 25.5m earlier in the year. While the reduction is unfortunate, the reason for it should be obvious: The

problem holding back growth in hardware unit volumes this year hasn't been demand, but supply. In other words, supply shortfalls are a temporary phenomenon almost by definition – a distinction that makes all the difference in the world. Lack of demand, on the other hand, is often a telltale sign that a consumer products company is headed for “game over” – and for good.

For example, every meaningful indicator through year-end suggested that Switch hardware demand remained far above the available supply in aggregate. In fact, long after the height of pandemic restrictions had passed, lingering supply chain disruptions made it hard for consumers to get their hands on any kind of Switch at all. And as late as February 2022 (when I first started drafting this letter), snagging the new, higher-priced OLED model remained extraordinarily difficult. In fact, demand has been so strong for this latest and greatest iteration of the Switch family that major retailers (and Nintendo itself) had to resort to a lottery system to fairly distribute units. In fact, demand at one major retailer in Japan was *thirty times* larger than supply! And then there's my own personal experience: I was one of the lucky few who managed to get a pre-order in this summer for the OLED Switch, and yet Walmart couldn't get it to me until almost a *month* after the guaranteed delivery date.

Taken together, one wonders how the sell side is coming up with its medium- to long-term estimates for Switch unit sales. Clearly, there is no justification based on the actual data. Are investors supposed to assume a return to standard console cycle dynamics from prior eras, “just because?” The whole premise is as baseless as it is dumb.

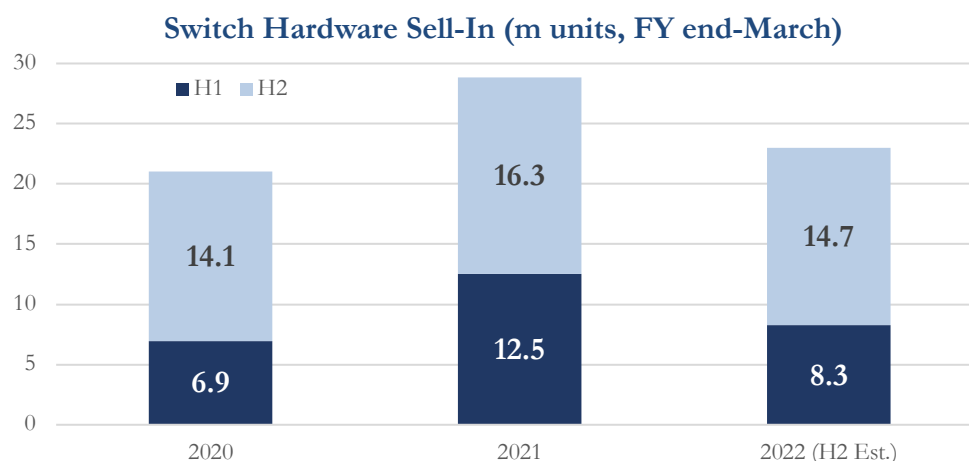
If demand is still robust, what's behind the supply problem? Well, assuming you've been living on planet Earth lately, you've probably heard about the global microchip shortage that affected console makers (and auto makers, and makers of pretty much anything with a microchip in it) throughout 2021. The good news is that it's only a matter of time before Nintendo gets its supply chain back in order. (Already, you can go on Amazon today and buy an OLED Switch at list price with next-day delivery, suggesting that the worst of Nintendo's supply chain issues are over.)

Ok, you might say, but what's organic demand this year? Isn't that the heart of the issue? The truth is it's impossible to say with any level of precision, but our best guess is somewhere in the range of 25 to 30m units – or pretty much in the same ballpark as fiscal 2021 (i.e., calendar year 2020), a year supported by the strongest tailwinds the videogame industry has ever seen. The thing is, even if true demand this year were around the 23m threshold set by management's new, lower guidance, there are many good reasons to believe that “peak Switch” demand is likely still quite a ways off. After all, the opportunity for Nintendo to create different channels of growth via the release of new Switch form factors and upgraded revisions remains massive, to say

nothing of the flywheel effect from its various initiatives in retail, theme parks, movies, and TV. And even if console sales have peaked, the stock remains insanely cheap, as we'll demonstrate in the valuation section later on.

All of which brings up another flaw in the “peak Switch” argument: It inherently assumes the Switch is a traditional console with a fixed lifespan subject to long-obsolete console dynamics from the Wii era. It boggles the mind, but analysts I've spoken with covering Nintendo are generally basing their Switch sales estimates on Wii-era data points, relying on what happened in a console generation that peaked all the way back in 2009 to inform their estimates over the next few years. That's like me basing my Apple estimates for the early 2010s on Apple's financials from 1998. It's a comparison that is objectively ridiculous, bordering on the absurd, even if you're not convinced of the perpetual nature of the Switch ecosystem or the durability of its ever-growing user base.

But you don't have to take our word for it. You can already see that Switch results to date have not tracked Wii data. For example, sales of Switch family devices have remained elevated far longer than sales of either Wii system did. Wii hardware sales peaked in year three at 25m units, before dropping off a cliff every year thereafter. And unit sales of the Wii-U peaked in year one at 3.4m, never really taking off in the first place. Meanwhile, while annual Switch console sales are indeed set to decline YoY in the current fiscal year that wraps up in March after FY 2021's *Animal Crossing*- and pandemic-driven one-off boom, it's important to keep in mind that unit sales are coming in well above their FY 2020 level.²⁰



²⁰ Granted, while annual unit volumes are being held back temporarily, there remains a decent chance that the release of the higher-priced OLED model last October will keep annual hardware sales at or above fiscal 2021 levels given the OLED's higher price point – another impressive potential accomplishment, all things considered.

Indeed, Switch console unit sales are on track to post a solid 4.6% CAGR over a two-year period that experienced sustained supply chain-based production constraints. That's a win by any definition of the term.

And if we consider the nature of the revenue and profit of Nintendo's Switch business, not just its hardware sales, we can glean another insight into why it's so foolish to use previous hardware generations as our baseline: Nintendo's percentage of nearly pure-margin digital recurring revenue back then was zero, compared to almost 20% and rising today. Not only is digital the company's highest-value segment, it also happens to be the one growing the fastest. Then there are Nintendo's multiple, unprecedented licensing initiatives underway, like its partnership with Universal theme parks and its needle-moving direct investments in visual content, like the new Super Mario movie set to debut in December. Of course, none of this existed in the Wii era.

Moreover, the Nintendo of 2008 didn't have a nascent, hugely profitable online subscription business, let alone one run-rating at over a billion dollars of recurring revenue a year like NSO. And don't even get us started on the fact that third-party support for both the Wii and Wii-U was nonexistent. Nintendo didn't have a fully-scaled third-party content distribution platform back then either – and certainly not one generating rapidly growing, essentially pure-margin recurring revenue as Nintendo's eShop does today.

By contrast, third-party Switch software revenue is at an all-time high. In fact, it now surpasses first-party revenue on a gross basis. Remember too that, as with Apple, Nintendo's moat is its software – its great games featuring its beloved characters. For Apple and Nintendo, top-class software (i.e. apps and games) creates a virtuous circle of demand. Users buy iPhones and Switches because those platforms have the best software. And developers create more apps and games for those platforms because they have the largest installed base of hardware. We mention this because the Switch is the clear leader in developer interest for videogame consoles. And that lead should only increase – first, because developer interest tends to be a self-fulfilling prophecy once you've reached exit velocity (the eShop's network effect has long since kicked in) and second, because new features and functionality from iteratively-upgraded hardware should punch third-party software development into high gear in the coming years.

To conclude, illogically basing Switch estimates on Wii results doesn't make sense regardless of how the street tries to spin it. The entire industry has evolved considerably since the Wii era, with Nintendo's business in particular having undergone radical change. Moreover, new growth drivers like the Pro suggest that the Switch family of devices has a long way to go before reaching its maximum active device installed base. Again, the combination of adoption by hardcore gamers and

incremental sales from pent-up replacement demand should be more than enough to propel hardware sales well above Nintendo's fiscal 2022 or even fiscal 2021 levels. And of course, while some users will rush to buy the Pro, Nintendo can appeal to others by refreshing the rest of its Switch lineup with Nvidia's new high-powered chipset, OLED screens, more memory, lower prices, and more.

Still, regardless of all these developments and trends on the hardware side, it's ultimately sales of software that move Nintendo's earnings needle. And that's just fine with us, because with major "system-selling" blockbusters (*Switch Sports*, *Splatoon 3*, multiple Pokémon games, a sequel to *BOTW*, and more) set for release in this fiscal year, Nintendo's software pipeline has literally never looked better. And while we'll touch on the optionality of successful theme park and retail operations, as well as TV and film franchises elsewhere in this update – and how it ties back into game and console sales – the bottom-line impact of these IP monetization levers remains severely underappreciated.

So for all the aforementioned reasons, we find concerns that Switch hardware unit sales will suddenly fall off a cliff this year (i.e., FY 2023) hard to take seriously. The same goes for the idea that Nintendo's revenue and profit are set to cyclically revert as they've done in the past. As my good friend (and fellow Nintendo long) Todd Wenning of Ensemble Capital noted, "If Nintendo had adequate supply, it could sell a lot more consoles." And while the current generation of Switches will eventually fade into obsolescence, the next one will layer on top and pick up any slack in demand. For this reason alone, talking about "peak Switch" in early 2022 makes about as much sense as talking about "peak iPhone" almost a decade ago.

So much for "peak Switch."

B. "Nintendo loves innovating too much to stick with just the Switch"

Another common bear argument is that the Switch isn't going to be an indefinitely-lived platform because Nintendo loves creating innovative new hardware too much to ever stick with a single form factor in the console space. All we can say is that we wholeheartedly agree that Nintendo views continuous hardware innovation as essential to creating new gaming experiences. Innovation is part of its corporate DNA. And we also agree that Nintendo can, and will, do a lot more in terms of layering in new Switch family form factors in the fullness of time. (This is the Apple Model at work, after all.)

Where we disagree is that any of that undermines our investment thesis. In fact, perhaps the biggest thing the "something new" bears get wrong is the idea that hardware innovation means restarting the hardware cycle. Their implicit assumption is

that Nintendo must throw out the Switch platform and start from scratch if it wants to innovate as it's done in eras past. Fortunately, this narrative is objectively wrong on several fronts.

First, Nintendo has already proven it can and will develop innovative new form factors *within* the Switch family ecosystem. Recall that 2019's Switch Lite was fundamentally different from the original. In fact, the "portable-only" Lite doesn't "switch" between TV mode and standalone mode at all.

Second, look at what Nintendo's done with innovative Switch-based peripherals. There are rumors of an upcoming Switch "console-in-a-controller", which we consider in Appendix 3. But for now, let's look at three actual examples of Nintendo's innovative spirit in action on the Switch platform:

1. Mario Kart Live: Home Circuit (MKL:HC)

MKL:HC rather brilliantly lets users set up a race course in their own living room and use the Switch to drive an actual, physical remote-controlled car around it. A small camera on the car displays its point of view on the Switch's screen, with various game elements (such as enemies and bonus items) added in. It's a hoot.

Given all the metaverse discussions that are commonplace today (in a way that wasn't the case when we released our original research a few years back), you'd think *MKL:HC* would get more attention. You'd also think Nintendo would get the credit it deserves on the innovation front, if only because Nintendo is the only company around with an actual – and hugely entertaining – augmented reality console game on store shelves.

There are augmented reality and metaverse games in the smartphone space, but it turns out that Nintendo owns a piece of most of those too. The wildly successful mobile juggernaut *Pokémon GO* comes to mind, as well as its less successful, but potentially more revealing (with regard to Nintendo's future in the space) recent experiments in "Exercise GaaS" like *Pikmin Bloom*. Both of these games were made in partnership with Nintendo's sister company Niantic, with more on the way.²¹

2. RingFit Adventures

RingFit Adventures, in conjunction with its innovative hardware peripheral, the Ring-Con (plus an additional leg strap accessory) lets players jog, sprint, and high-knee

²¹ See <https://techcrunch.com/2021/03/22/niantic-announces-partnership-with-nintendo-on-new-augmented-reality-pikmin-title>. We'd also note that because Nintendo owns roughly 20% of Niantic, it stands to reap massive upside if Niantic succeeds in these and other augmented reality and metaverse endeavors.

through dozens of levels while battling enemies. Think of it as Nintendo's first Switch family foray into the exercise videogame genre – a genre it arguably created way back with *Wii Fit*. It's essentially a combination of Pilates, yoga, cardio, and strength training, all done as part of an entertaining, engaging videogame adventure. And if Peloton's success is any indication, there could be substantial latent demand for exercise-related GaaS-based content.

Call us crazy, but there are worse places to start building a connected fitness ecosystem than an installed base of over 14m devices and plenty of existing content, especially given that Nintendo has recently allocated over \$900m toward expanding its in house frameworks for software development. And what better way to put some of that capital to work than by creating differentiated live service offerings focused on the exercise videogame space? In other words, Nintendo has a real opportunity to establish a connected fitness ecosystem like Peloton's – only dramatically less expensive and way more fun.

3. Switch Sports

Finally, no discussion of Nintendo's ability to innovate would be complete without mentioning the imminent release of *Switch Sports*. It's following in the footsteps of the company's exercise-related megahit *Wii Sports* series. In fact, the original *Wii Sports* is the single best-selling console game of all time,²² and exercise-related Wii titles make up four of the top 16.²³ We think Nintendo's more advanced and entertaining Switch-related forays into the exercise videogame space (backed by its recent redoubling of its GaaS efforts) could encounter a similar level of success.

While it's not often discussed, Nintendo has an incredibly valuable opportunity to create "Exercise GaaS" offerings that combine its gold-plated IP portfolio with Niantic's AR expertise.²⁴ In fact, a focus on "Exercise GaaS" titles could represent a golden path to the smartphone success that's eluded Nintendo thus far. Management's concerns about smartphone games' (1) user interface-limited gameplay and (2) sometimes exploitative methods of monetization would essentially disappear, and Nintendo could finally give smartphone users the kind of high-quality entertainment experiences it's famous for delivering.

²² This is largely because it came packaged with the Wii, but it was a massive hit in its own right.

²³ *Wii Sports*, *Wii Sports Resort*, *Wii Fit*, and *Wii Fit Plus*.

²⁴ This recent Nike video suggests what's possible in exercise GaaS, as well as its potentially immense consumer appeal: <https://www.youtube.com/watch?v=8rYmBB5zU0w>

In any case, the three examples above show that the Switch hasn't stopped Nintendo from coming up with innovative new hardware. But the reality is even better than that, because the Switch platform's indefinitely-lived hardware-software ecosystem actually makes it *easier*, not harder, for Nintendo to do so. That's because it gives Nintendo free rein to try out endless form factors and gameplay concepts without requiring users to throw out their old software collections and start building new ones at great expense. Indeed, such robust hardware innovation is exactly what we've seen with Apple's iOS-based ecosystem to date – and if Apple hasn't been creatively restrained by its hardware platform, why should Nintendo be?

C. “Nintendo doesn't invest for growth or reward shareholders”

How should investors value Nintendo's liquid assets? It's a great question, and an entirely fair one for most of the last 30 years. Fortunately, times change, and Nintendo's management has started putting the company's extra cash to good, value-generating use.

Of course, it's not abnormal for successful tech companies to hold plenty of cash – just look at Google. However, as we explained in our 2019 annual letter, the market has long believed that Nintendo, as a tradition-minded representative of “Japan, Inc.,” would simply let excess cash pile up and lie dormant on its balance sheet. Like other Japanese blue chips, the story went, Nintendo simply didn't care about realizing latent shareholder value and would likely never take meaningful steps toward rationalizing its vast overcapitalization. But let's look at how the story has changed.

1. Change in Nintendo's corporate governance and capital management

While there may once have been some truth to this longstanding theory, it was already starting to crack and crumble when we first wrote about it back in 2019 – and subsequent developments have caused it to all but collapse. Let's look at just two of the uses Nintendo management has recently found for the company's cash reserve:

- First, this past September Nintendo spent \$864m to buy back and cancel 1.8m common shares – and that was after cancelling 10m shares back in February 2019.
- Second, this past November Nintendo announced it would spend just under \$4bn (above and beyond ordinary capex) on expanding its core games business, pursuing brand-building projects and partnerships (such as movies and toys based on Nintendo characters), and developing improved online services centered on users' Nintendo Accounts.

These actions, combined with the company's historical dividend policy and recent corporate governance improvements (including its recent announcement that it will not only be uplisting to Japan's new prime market on the Tokyo Stock Exchange, but will also be implementing various ESG initiatives as part of a larger effort to diversify the gender makeup of its board), are clearly not the handiwork of an old-line "Japan, Inc." management team content to just mind the store. Recently, management even noted that dividend increases and further buybacks remain on the table for the foreseeable future, something we can't recall it ever explicitly stating before. And it also "hedged its hedge" by indirectly admitting that Nintendo's historical rationale for maintaining a large cash reserve – to hedge against the failure of a new console – no longer makes sense. Instead, management's new rationale for retaining a well-capitalized balance sheet has to do with the hit-driven nature of its new push into movies. That's a subtle but telling change, in our view, that lines up beautifully with the larger fact pattern underpinning our thesis.

And while we don't expect Nintendo will follow Apple's lead and start engaging in aggressive (at least by Japanese standards) forms of financial engineering, we do feel that one thing seems clear: Historical arguments about how Nintendo is likely to deal with its vast overcapitalization no longer hold. Yes, it's true that discounting Nintendo's cash balance heavily, if not to zero, once made sense. After all, if minority shareholders can't rely on management to put Nintendo's excess cash toward its highest and best use (or *any* use, for that matter), then it was hard to justify valuing a dollar as a dollar on its balance sheet. But again, those days are long gone. For years now, Nintendo management has been hard at work updating not just the company's core business model, but also its approach to corporate governance and capital management writ large. And positive change on these fronts is accelerating. That means the validity of backing out at least a large portion of Nintendo's existing cash balance is now the analytically valid (and intellectually honest) approach given today's Nintendo has demonstrated not just its willingness to return cash opportunistically, but to invest heavily for growth.²⁵

Of course, all that means the big N is even more egregiously undervalued than its earnings outlook or market cap alone might suggest. Moreover, tired claims that Nintendo's \$13bn-plus in excess cash doesn't represent true downside protection are equally specious. And besides, the drag on returns that Nintendo's vast

²⁵ While we think it's time to start placing some value on Nintendo's extra cash, unfortunately we don't expect the market to start discounting Nintendo's non-core long-term equity stakes in companies like Niantic and The Pokémon Company (TPC) any time soon. However, their value is real. TPC is perhaps the most valuable media entertainment IP on Earth, and the value of Niantic, Bandai Namco, the Seattle Mariners, DeNA, and the rest is hardly in doubt either. We just don't think the market will reward Nintendo for these stakes, so we've elected to not back them out in our analysis here today. Of course, things could change if Nintendo takes direct action to unlock all that value itself. For the first time in 40 years, the idea doesn't sound totally crazy, given the incoming waves of Japanese corporate reform, recent M&A in the space, and various other factors discussed below. Fingers crossed!

overcapitalization once had on its ROE would be a non-issue even if the objective fact pattern highlighted above weren't the case.

2. Change in Japan's business and economic policies

All that corporate change at Nintendo isn't happening in a vacuum. Japan is fast approaching its next major wave of corporate reform, with several game-changing policy initiatives set to kick off this April – and investors seem largely unaware of their enormous value-unlocking implications.

Unlike past attempts at reform, the initiatives set to begin over the next few months will have real teeth, thanks to the Japanese government's recent revision of its Corporate Governance Code (CGC). Indeed, Japan is embarking on a series of shareholder value-enhancing reforms deeper and more comprehensive than anything that's come before, **thanks to government-led enforcement mechanisms targeting roughly 60% of the country's publicly listed businesses.**

Incredibly, the government, with the tacit approval of the court system, is taking concrete actions aimed at unwinding the unique, longstanding Japanese corporate practice of cross-shareholdings and other policies that have historically made it impossible for institutional investors to influence corporate boardrooms. For example, businesses like Nintendo that are listed on the TSE's Prime Market will have to appoint a majority of independent outside directors to their boards (or answer to the government if they have not) no later than April 4th. This is in addition to the government's newfound requirements on corporate disclosure and the rights of minority shareholders, regardless of size. As just one example, Japanese businesses listed on the Prime Market must now offer electronic voting platforms and make corporate materials and relevant disclosures available in English. The list goes on.

We think this tectonic shift in policies affecting both corporate governance and capital management should have profound implications for Japanese businesses over the medium and long-term. After all, **these reforms are being done out of necessity considering the existential issues facing the Japanese economy.** Because Japan's population has been rapidly aging and declining for decades, the government believes that growing the productive capacity of its economy requires improving the capital efficiency of Japanese corporations. In fact, without genuine reform capable of catalyzing sustainable growth, the future for Japan looks bleak. So for these reasons and more, the government's solution is to finally address the fundamental inefficiencies of Japanese corporations through reforms codified into law. This reform push means that Japan's notoriously poor corporate governance should soon measure up to global standards, and that means the large and growing gap between corporate

valuations in Japan and those of other countries in the developed world should close.²⁶

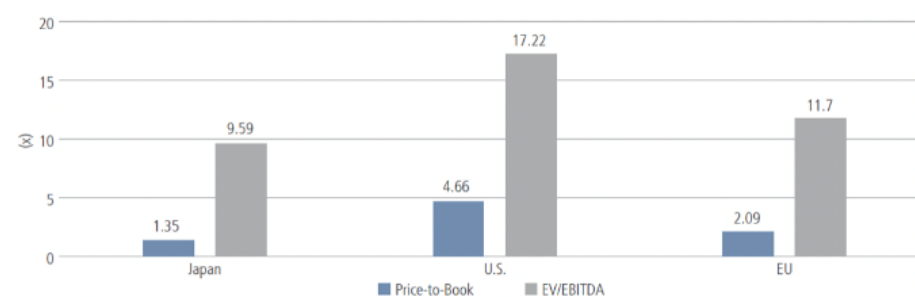
3. A new era of Japanese M&A

Another benefit of this coming wave of Japanese corporate reform will likely be a sustained, unprecedented period of large-scale Japanese M&A. Consider the following data points: Over half of the corporations that make up Japan's TOPIX (its broad market index akin to our S&P 500) are currently trading below book value. If that weren't crazy enough, Japanese businesses also now trade at the highest earnings yield relative to bonds in the developed world. Add in the fact that Japanese corporations are extraordinarily cash-rich (with roughly 40% of non-financial companies in the TOPIX sitting on net cash reserves that, on average, are 20% greater than their market capitalizations) and the setup starts to resemble a value-oriented private equity paradise. Perhaps this is why so many of these cash-rich, deeply undervalued Japanese industrial conglomerates have begun buying back their undervalued shares in earnest, pushing capital return activity in Japan near an all-time high.

Once again, you don't have to take our word for it. The following charts (from the Kei Okamura white paper cited in footnote 27) illustrate just how bombed-out Japanese valuations have become relative to those of other developed nations, while also showing the accelerating pace of positive change on the governance and capital management front:

FIGURE 1: VALUATIONS OF JAPAN, U.S., EU COMPANIES

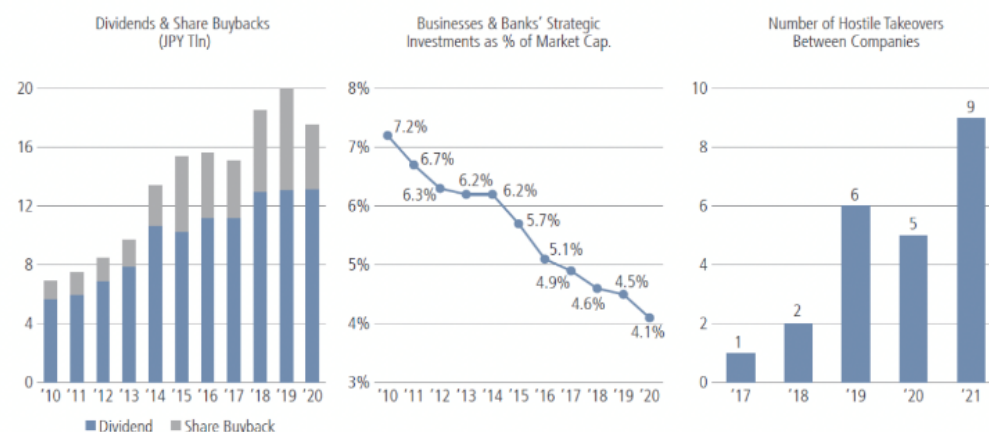
Lack of progress in the transformation of Japanese businesses has depressed valuations versus other developed markets



Source: Bloomberg, as of September 28, 2021. Japan: Topix, U.S.: S&P 500, E.U.: EURO STOXX 600. For illustrative purposes only. Due to a variety of factors, actual events or market behavior may differ significantly from any views expressed or any historical results. Investing entails risks, including possible loss of principal.

²⁶ Proper analysis of coming Japanese corporate policy reforms is well beyond the scope of this update. However, for those seeking more information, we highly recommend the white papers *Japan's Coming Wave of Reform* by Kei Okamura (<https://www.nb.com/en/global/insights/whitepaper-japans-coming-wave-of-reform>) and *Japan Equities: Entrenched Perceptions Ignore Improving Reality* by Drew Edwards and Rick Friedman (https://www.gmo.com/globalassets/articles/white-paper/2022/japan-equities---entrenched-perceptions-ignore-improving-reality_1-22.pdf). In addition, Japan Exchange Group has published a helpful primer on the overhaul taking place on the Tokyo Stock Exchange at <https://www.jpx.co.jp/english/equities/market-restructure/index.html>.

FIGURE 3: SHAREHOLDER RETURNS, STRATEGIC INVESTMENTS, HOSTILE TAKEOVERS OF JAPANESE COMPANIES
Capital management reforms are taking shape among Japanese companies



Source: (LHS) JPMorgan, as of December 31, 2020; (middle) SMBC Nikko, as of August 31, 2021; (RHS) IR Japan, as of October 31, 2021. For illustrative purposes only. Indices are unmanaged and not available for direct investment. Investing entails risks, including possible loss of principal. **Past performance is not indicative of future results.**

With corporate boards, as well as financial and strategic buyers, finally incentivized to correct perhaps the most inefficient developed capital market in the world, we think the next few years will see Japanese corporate valuations rise considerably, reducing the longstanding valuation disparity between Japan and other developed markets in lockstep.

At any rate, we'd like to echo GMO's sentiment (in its essay we noted in footnote 27 above) by noting that when it comes to what "everybody knows" about Japan, investors would do well to revisit their biases and acknowledge that substantive change has already occurred – and will continue to occur. Indeed it must if Japan hopes to regain its stature in the global economy. Perhaps that's why top investors like Warren Buffett²⁷ and private equity stalwarts like KKR and Carlyle²⁸ have jumped into Japan with both feet.

Bringing this all back to Nintendo, a large-scale revaluation of Japan's corporate sector would of course be great news for Nintendo shareholders. Perhaps we're wrong, but as a world-famous Japanese company, Nintendo has all the incentive in the world to not just comply with Japan's wave of corporate reform, but to be its standard bearer. Therefore, we think the big N will start returning capital to shareholders at a rate at least in line with its annual earnings capacity. That approach

²⁷ <https://www.barrons.com/amp/articles/berkshire-hathaways-yen-bond-sale-indicates-warren-buffett-is-buying-japanese-stocks-51641400198>

²⁸ <https://www.japantimes.co.jp/news/2020/08/12/business/corporate-business/kkr-carlyle-bet-japan-dealmaking/>

would deliver interesting results for shareholders, as we explain in the valuation section later on.

D. “The Switch doesn’t have enough third-party support”

In July of 2020, industry observer Mathew Ball published on his own website an essay titled *Nintendo, Disney, and Cultural Determinism*.²⁹ In it, he questioned Nintendo’s adaptability and its willingness to evolve, and wondered whether investors might be overestimating the significance of the value-unlocking change going on at the company.

While we agree with Ball’s contention that there is no other gaming company “with more beloved and long-running IP, a stronger culture of creativity in storytelling, a deeper history of immersive/technological innovation, or a more resonant content brand,” and quite a few of his general observations, unfortunately the essay isn’t one of his best. It’s riddled with false premises, apples-to-oranges comparisons, and incorrect or misleading statistics. And it’s premised on a straw man argument that Mr. Ball seems to erect just to knock down; that “Many believe that Nintendo is Disney circa 2014 or 2015 or 2016 or 2017[.]” He claims this argument “more like a desire to apply a pattern than a genuine attempt to find a real analogue.” However, we’ve read pretty much every analysis on Nintendo for at least the last four years, and we’re not aware of a single investor who believes the intrinsic nature of Nintendo’s business, management style, and approach to content is fundamentally the same as Disney’s. Ironically, it’s Ball’s essay that “feels more like a desire to apply a pattern than a genuine attempt to find a real analogue.”

However, Ball’s essay does do a great job of highlighting just how much confusion about Nintendo remains in the public sphere. It also illustrates how even prominent thought leaders in the videogame space manage to get the Nintendo story profoundly wrong. To be sure, we generally admire Ball’s work, so this isn’t personal. However, we’ve encountered so many analysts who parrot his views without proper scrutiny that we felt compelled to cover at least a few of this particular essay’s more notable problems head-on.

To start, Ball claims that Nintendo doesn’t have a true platform for videogames. You might be thinking, “Hey, what about the Switch?” But according to Ball, the Switch isn’t a true platform because it lacks enough third-party support, claiming that roughly 85% of Nintendo’s software revenue comes from its own (first-party) game sales. He argues that this reliance on its own software means Nintendo can’t earn much by just

²⁹ <https://www.matthewball.vc/all/onnintendo>

sitting back and taking a cut of revenue from Switch games produced by third parties. However, this argument is both flawed and extremely misleading.

First, the 85-15 split Ball cites was already dated at the time of his essay's release, and now tilts much more heavily toward third-party revenue. Second, Ball fails to distinguish that Nintendo books first-party revenue on a gross basis and third-party sales on a net basis. In other words, if a third-party game generates \$1m in revenue from users, Nintendo counts only \$300,000 (i.e. its 30% eShop fee) in its net revenue figure, instead of counting the full \$1m as revenue and \$300,000 as gross profit. That's a key distinction. On an apples-to-apples gross revenue and unit basis, over *half* of Nintendo's total sales for both packaged and downloadable software are currently derived from third-party games.³⁰

Ball goes on to quote Epic games founder and CEO Tim Sweeney, who says that "something is a platform when the majority of content people spend time with is created by others." Well, it turns out that the majority of content purchased on the Switch today is created by others, and once again, this was true at the time the essay's release. In fact, there have never been more third-party titles available for any Nintendo console than there are right now for the Switch.

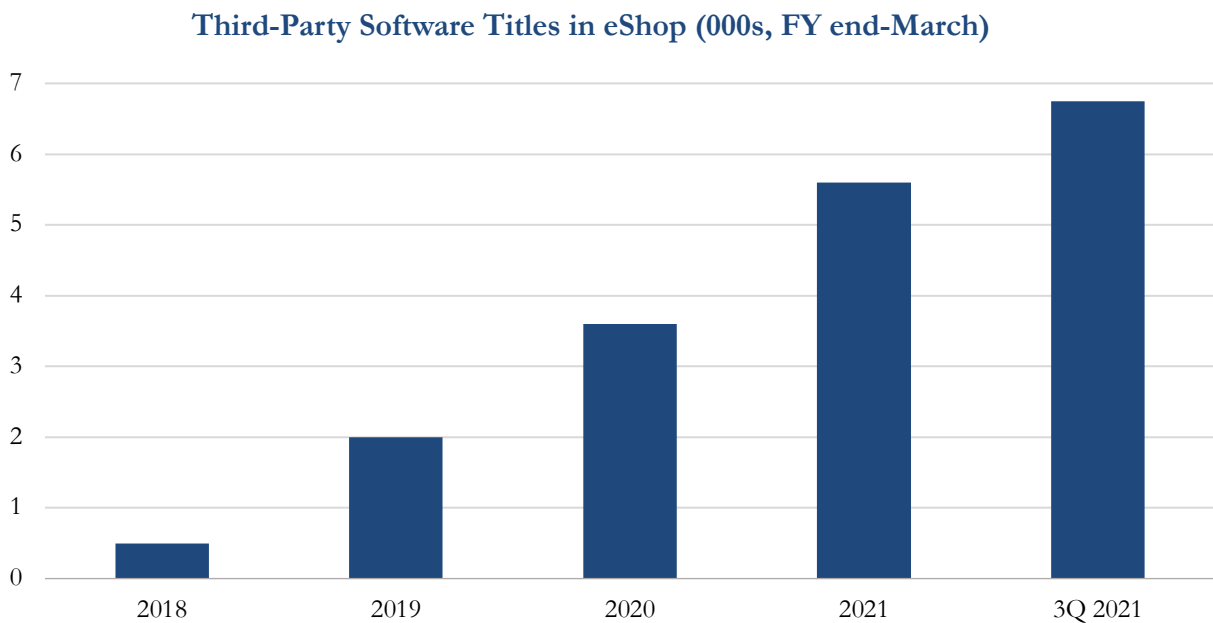
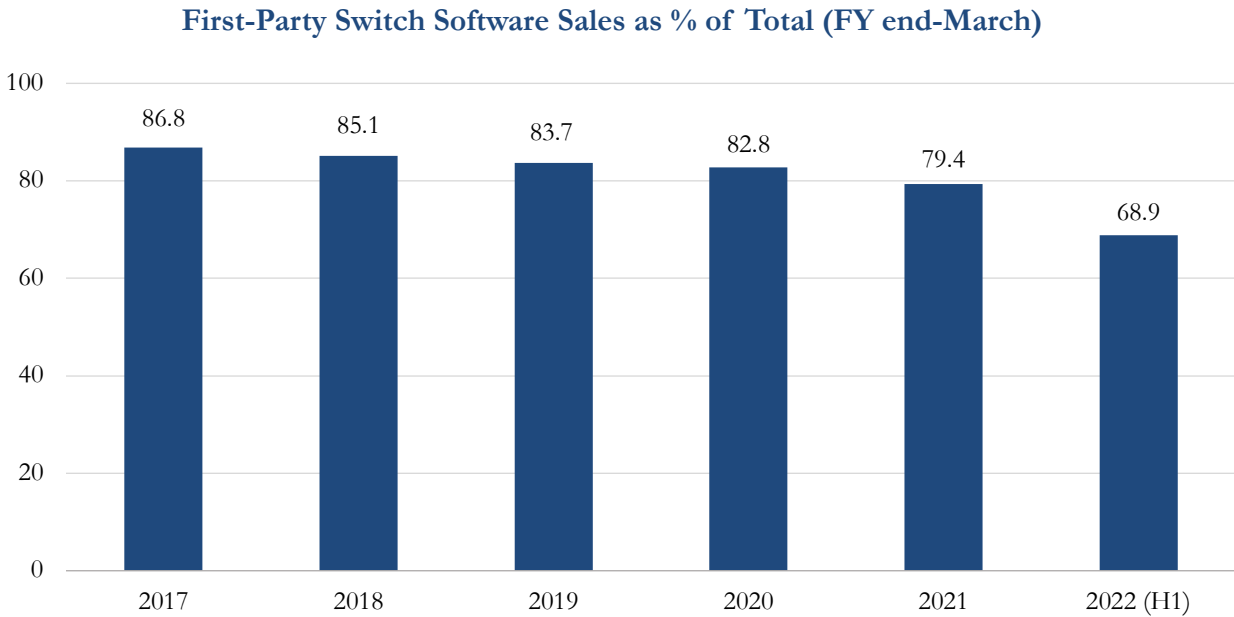
And given the company's recent multi-billion-dollar investments aimed at least in part at empowering developers (and DevOps process improvement) not named Nintendo, it seems clear that Nintendo today is focused on what third-party developers want and need in a way that it hasn't been since perhaps the NES era. We suspect that's because Nintendo knows better than anyone that the support of major third-party developers like Electronic Arts, Activision, and Take-two would significantly improve user engagement and hence, the overall monetization of the Switch platform, if only Nintendo offered more powerful hardware.

But Ball doesn't just misrepresent the Switch's current level of third-party support. He also ignores that Nintendo's support has been booming since day one (as shown by the annualized growth rate of the number of third-party publishers and the level of third-party software sales in the eShop). In fact, as the top chart on the next page shows, third-party software sales for the Switch have grown as a percentage of the whole YoY every year since the Switch launched.

Again, don't take our word for it. Consider the 42-month period from March 2018 through September 2021 – i.e. from right around the time we started to build our position through the October reporting period last year, when these figures were last disclosed. In that time, as the bottom chart on the next page shows, the number of

³⁰ Note these figures don't including revenue from indie game sales, only sales from major game publishers around the world. (Indie sales aren't included in the metrics management cites, given the wide array of price points as stated earlier.)

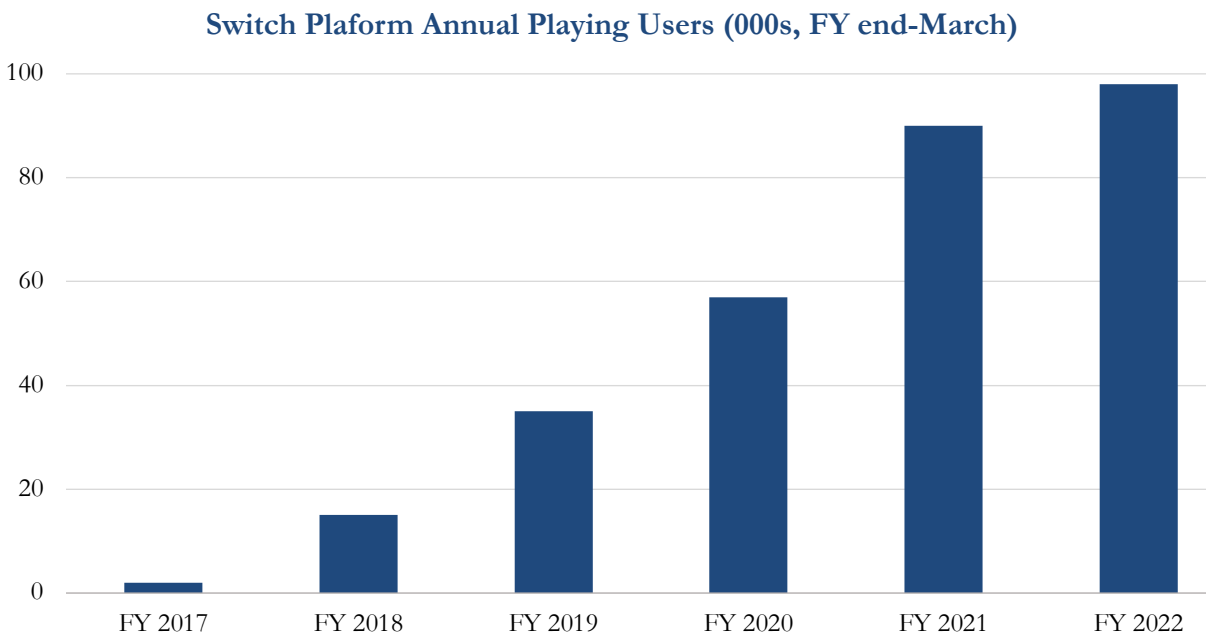
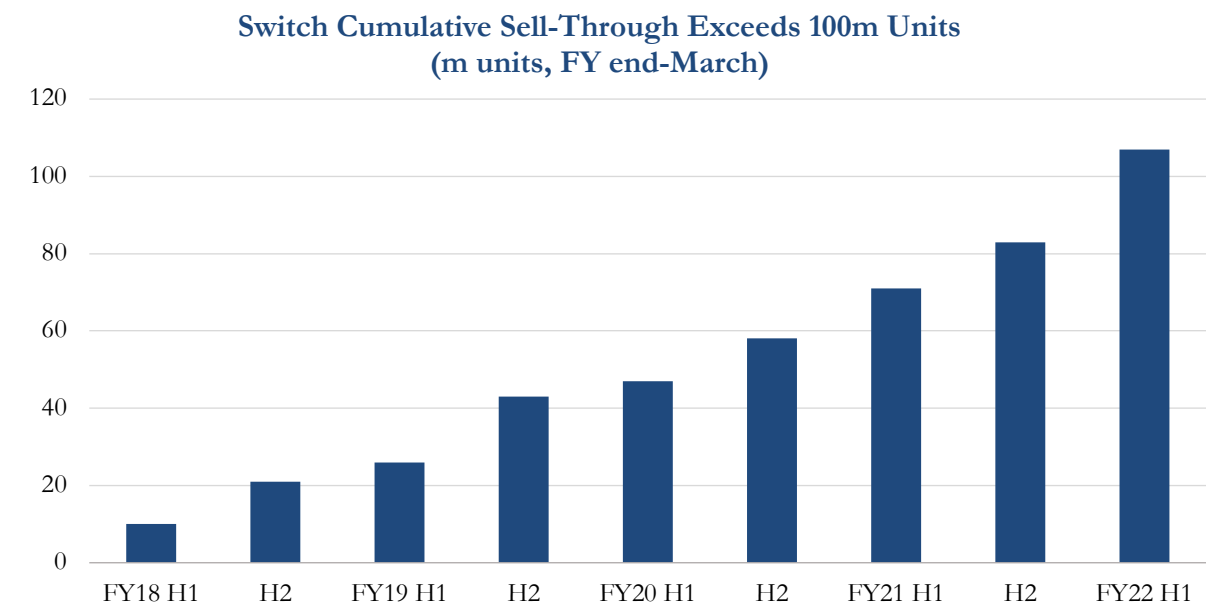
third-party software titles available in the eShop went from 500 to 6700, increasing approximately 13-fold over three and a half years. That's a CAGR of 109%!



But what if we look at the growth rate of third-party software sales, instead of the growth rate of third-party titles available on the platform? Again, it's just more of the

same. In this case, third-party software sales have grown at almost a 40% CAGR through FY 2022. Yeah, nothing to see here.

In the charts below, we look at some other KPIs typically associated with the ecosystems of dominant platforms that are both healthy and growing:



As you can see, they support our contention that the Switch platform is strong and getting stronger. Not only have the number of devices and the total number of software sales grown like clockwork with every passing year, but the platform's annual playing user base remains highly engaged. Through the first three quarters of fiscal 2022, the number of annual playing users is at an all-time high.³¹

Ball also missteps by treating the Switch it as if it were just another one of Nintendo's traditional consoles with a fixed lifespan. As such, he uses the rise and fall of the Wii as a model for what will happen with the Switch – which, as we've already discussed, is nonsense. For example, he focuses on whether the Switch can be the “winner” over PlayStation and Xbox in a particular console generation, when in fact it's no longer bound by the traditional generation-by-generation console business model at all. And more bewilderingly, he doesn't even get that right. He states that the Switch has sold 45% fewer units than the PS4 and 10% more than Xbox One and uses those data points as evidence of the Switch's supposedly poor relative performance.

And while we haven't attempted to deduce how Ball arrived at those numbers, we can confidently state they were way off base. For example, the chart below shows Switch family hardware unit sales versus those of other consoles *over each console's first 72 months on the market*. In other words, it provides a contextually correct comparison set instead of giving the PS4 and Xbox One a four-year head start over the Switch due to their earlier launch dates, a methodology we can safely say is absurd on its face. Furthermore, the chart on the next page³² shows that the Switch has already surpassed lifetime sales of both the Wii (101.63m) and Sony's original PlayStation (102.49m), a console, mind you, that was on the market for an incredible 13 years.

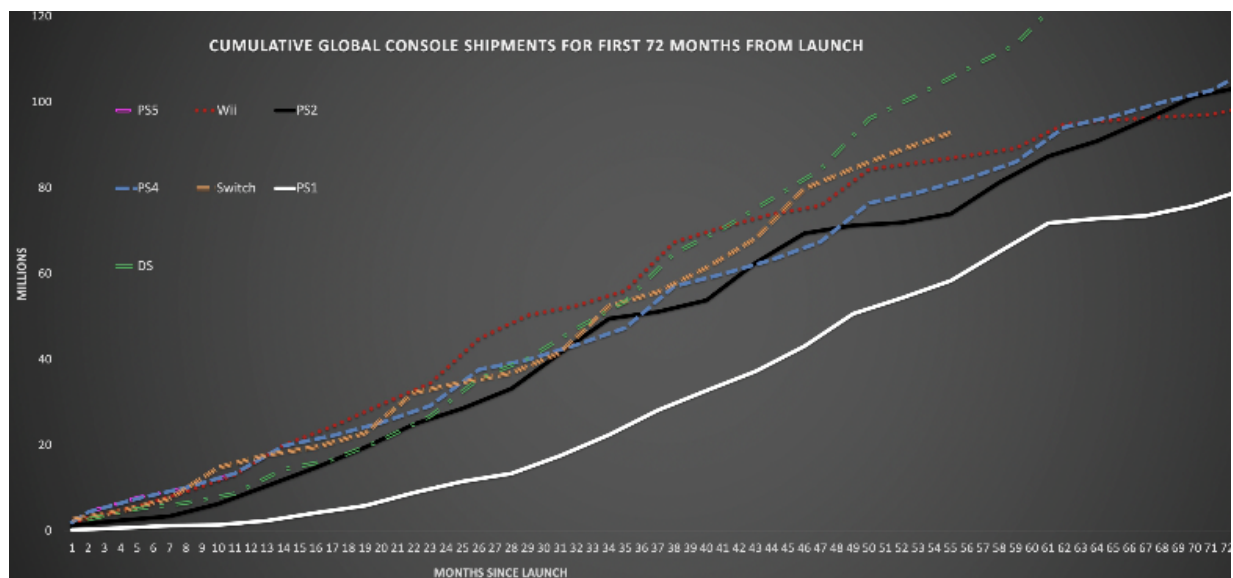
On an apples-to-apples basis, then, the Switch has sold faster than the Wii, the PS4, *and* the PS2. In fact, the Switch platform is well on its way to becoming the best-selling console of all time. Once again, irony abounds!

At any rate, looking at the Switch's eighth-generation console peers, simply eyeing the chart shows that launch-aligned Switch sales have outpaced those of the PS4 at least 80% of the time. And during the infrequent, brief periods when the PS4 pulled ahead, its lead was miniscule. In short, there has literally never been a period when the Switch has been 45% behind Sony's PS4 in launch-aligned cumulative unit sales. (As

³¹ Nintendo reported an “annual playing users” metric last November for the first time. It stands a general proxy for active devices within the Switch ecosystem at any given time. In fact, the ratio of active devices to cumulative devices sold is perhaps the single most important metric for accurately deciphering the health of Nintendo's business, much as it has been with Apple over the last 15 years. So we're thrilled to see Nintendo follow suit. Regardless, there is no better metric available when it comes to predicting Nintendo (or Apple's) medium- to long-term earnings power.

³² https://twitter.com/ZhugeEX/status/1489150666585034759?s=20&t=hMI57ARqcyJsYvm_2DW6kw

far as Xbox One, its own launch-aligned relative performance appears to have been too pathetic to even include in the chart.)



In sum – and entirely contrary to Ball’s claim – Nintendo has an extremely healthy third-party developer ecosystem, as well as a highly engaged and large, fast-growing user base. And things should only get better from here. But just so we’re clear, the Switch is objectively a true videogame platform well past exit velocity, having ignited the third-party network effect years ago. And that network effect (the positive feedback loop in which its large user base attracts more third-party developers, who in turn attract more users) is on the cusp of accelerating dramatically thanks to announced network investments and the launch of higher-powered hardware later this year.

IV. VALUATION

While wrapping up our 2018 annual letter, we made a few observations that remain just as true today as they were after its release in early 2019. Indeed, by any reasonable measure, Nintendo continues to trade at a giant discount to the liquidation value of its on- and off-balance sheet assets, not to mention any reasonable estimate of its medium- to long-term earnings capacity, despite enormous progress de-cyclifying its console business and better monetization of its industry-leading IP. As a result, it’s become hard to envision a realistic future market or economic scenario in which we’d lose money. In fact, Nintendo’s current setup is superior on essentially every major variable that drove our first purchases almost three years ago to the day. And that’s a

decision that's worked out okay, given that the stock has compounded at an annualized IRR of 30% since we initially built our stake.

To be clear, we're not claiming we got everything right, or that Nintendo executed perfectly. And it's certainly not the case that investors more generally have come to properly appreciate the permanent improvements to Nintendo's business model. Far from it. But that's our point: We didn't need everything to click perfectly into place to do extraordinarily well – and we still don't today. After all, despite an already depressed multiple and continued improvements in its core business fundamentals, Nintendo declined nearly 20% in 2021. Indeed, the implied return from investing in Nintendo's shares in early 2022 has been both increased and de-risked by time, and not just because of the blown out price to value spread just mentioned, but because of all the value-unlocking change we've been discussing throughout this update. The result is a coiled spring pressed down hard before the inevitable pop.

So what do we think Nintendo is worth? Before we dive in, we should state that any valuation framework is not a final answer on an exam but rather just one tool in a toolbox intended to help us estimate a reasonable range for Nintendo's intrinsic worth five years from today. Moreover, while the future is always and everywhere uncertain – and we hardly possess a crystal ball – the reality is that business outcomes at an individual company level three to five years out *can* be predictable.

That's not to say we have any idea where the market will be in six months or even a few years' time. We don't. But given Nintendo's basic strategy, its recently-announced capital allocation initiatives, its current valuation, and the many years of exhaustive diligence done on the business, we do have a pretty good idea of how its model will evolve in the coming years and how that evolution should affect its bottom line. For example, as Nintendo's increasingly direct-to-consumer Switch platform continues its ongoing shift toward a persistent digital ecosystem, we should see its operating margins explode as distribution costs dissipate. Consequently, we have very little doubt about the ultimate endgame.

We mention it because we've recently been able to add to our longstanding stake at a valuation that should deliver an even better IRR than what we've earned to date if Nintendo's story continues to play out as we expect – while earning solid returns, around our hurdle rate, if it doesn't. Exactly the type of bet we live to make.

In any case, Nintendo is no longer a "hit-driven" cyclical, let alone one on the far side of "peak earnings", as most on the sell side think. Rather, its earnings should continue

to grow for many years as its longer-term transition into a secular growth juggernaut supported by a stable, ever-growing user base accelerates over the next 36 months and beyond.

With that, we want to quickly note that there are quite a few moving parts in Nintendo's business, so we've tried to keep things simple – and trollishly conservative, if only to make a point. After all, by being nonsensically conservative in our valuation analysis, we are better able to illustrate just how preposterously cheap Nintendo is at or around the current quote. Our hope is the exercise drives home just how much could go wrong for the company while still allowing investors to walk away solidly in the black. For example, even if the several streams of visible, extremely high-margin incremental revenue that we've left out of our Base Case model somehow fail to materialize, risk-adjusted equity returns for Nintendo's investors should *still* be relatively spectacular, compounding at nearly 20% per year over our forecast period. Not bad.

But let's not get ahead of ourselves. At roughly 13x earnings (and less than 12x ex cash), we feel Nintendo represents an extraordinary value for a dominant business with a growing moat that should benefit from several hard catalysts in the near-term, not to mention powerful secular forces driving positive and permanent change longer-term – all factors that bode well for substantial future equity gains.

A. Churn: Factoring in planned obsolescence

Before we dive into our first valuation scenario, we want to quickly mention a critical difference between it and our past analyses. Nintendo's continued transition toward the Apple Model means we must now start to account for upgrades and the planned obsolescence of older Switch devices. For example, a user may upgrade his older Switch to a newer model or buy a new Switch to replace one that was broken or lost. Obviously, those old, replaced Switches will no longer be generating any revenue for Nintendo. Therefore, we've started factoring device "churn" into our estimates, via an "active annual user" line item, so we can arrive at a clean number for Nintendo's true active user base by properly accounting for the relationship between active devices and cumulative devices sold.

In fact, while deriving an approximate estimate of Nintendo's active user base is extraordinarily powerful when it comes to extrapolating Nintendo's earnings power at any given point in time, the reality is that it's the active device ratio, i.e. the ratio of active devices to total devices sold (see footnote 31), that is the more valuable of the

two metrics – at least when it comes to assessing the true state of Nintendo’s business.

This is the case for at least three reasons: First, the ratio gives us insight into the absolute size of the Switch platform’s installed base. Second, it speaks to the resilience of that user base (i.e. engagement stability). And third, it suggests the length of time (duration) of use per device from Nintendo’s customer base. As a result, it’s a great proxy for user satisfaction and loyalty.

But circling back to our estimate of Nintendo’s churn rate, note we took the midpoints of the standard life cycles for both home and portable consoles and averaged them to arrive at an estimate of roughly 10 years for a Switch device’s average lifespan. In other words, the numbers underpinning the scenarios in the model assume annual churn of 10%. We then take 90% of that “net of churn” active device base to get our active annual user line item, which in our model amounts to 132m active users (assuming one device per user) on a total of 208m Switch devices purchased by year-end 2027.

We would only add that a 10% churn rate is defensible on several levels. First, the average life of a hardcore Nintendo fan today is obviously longer than ten years. Second, Nintendo’s earnings report released this past February 2nd disclosed that it had over 98m annual playing users, versus an installed base of roughly 103m since the platform’s launch in early 2017.³³ In a nutshell, realized churn thus far has been basically nil, as only about 5% of all Switch family devices ever sold are inactive. Third, the application of optimized visual technologies and the rise of cloud gaming, which offloads a game’s processing burden onto remote servers, letting older, obsolete hardware play newer, power hungry games, should meaningfully extend the useful life of older Tegra-based devices.³⁴ Regardless, we’ve included a sensitivity table at the end of this section so you can see how various assumptions for churn and other

³³ We’re assuming one device per user. While some people may own multiple Switches, and some Switches may be shared among multiple people, we think one device per user is a good working assumption.

³⁴ For example, recent reports on the beta test of Switch Sports suggest that Nintendo will be using AMD’s FidelityFX Super Resolution (“FSR”) technology for its first party titles. FSR is AMD’s version of DLSS 2.0 that we expect will be used to supplement older hardware after the Switch Pro’s release. However, FSR can be used with any GPU (i.e. it isn’t reliant on a NVIDIA graphics card or tensor cores). Consequently, FSR serves as a backdoor way to simultaneously improve both hardware and software performance of existing and new Switch games while significantly extending the useful life of aging Switch devices, increasing the life-time hardware value of older Tegra-based Switch hardware.

variables affect our estimate of Nintendo's value on the off chance you think we're overplaying the investment case.

B. Our Base Case DCF

For our hyper-conservative Base Case DCF, our primary assumptions are as follows:

The Switch's average installed base rises to 208m units by the end of FY 2027, or roughly 132m "active" users after accounting for device churn. In the nearer term, we expect the Switch will end FY 2022 with a cumulative installed base of roughly 107m units, implying per annum Switch sales come in around the 23m unit mark, in line with Nintendo's recently revised guidance. For FY 2023, we anticipate unit sales will fall modestly to about 22.5m despite (1) the best software lineup in recent memory (important, because software is the primary driver of hardware sales) and (2) a massive expansion of the buyer base with the expected debut of the Switch Pro in the back half of the year. Finally, we expect annual hardware sales to normalize at that 22.5m level over our forecast period.

And again, these estimates assume zero uplift in console sales despite the expected release of more powerful hardware and multiple "system-selling" games throughout 2022 (i.e., Nintendo's FY 2023). And if that weren't silly enough, the forecast assumes Nintendo has no product roadmap for the future, as if continuous innovation on the hardware front weren't embedded deep down in Nintendo's corporate DNA. Finally, our estimates assume no long-term benefit from Nintendo's theme park, retail, television, or film initiatives boosting its game and console sales. None of which are intellectually defensible based on what is known today. So it should go without saying that all of these assumptions are ridiculously conservative. Nonetheless, we've decided to run with them anyway – again, if only to prove a point.

We assume NSO's average installed base of subscribers reaches about 52m users by year-end 2027, for an attach rate of roughly 40% by the end of the forecast period (lower than the 43% attach rate of Sony's PlayStation ecosystem today).

We further assume a gradual increase in NSO's average revenue per user (ARPU) toward \$50 by year-end 2027, a level well below the absolute low end of what Sony and Microsoft charge for their online services. Moreover, our outlook implies a price of just \$4.16 per month for a service that offers not just online gameplay and cloud-based data storage, but Nintendo's classic NES, SNES, and N64

game libraries (and the Sega Genesis game library to boot!), various well-received live service games (like *Tetris* and *PacMan 99*), and free DLC.³⁵ Framed another way, NSO's N64 Expansion pack is less than half the monthly cost of comparable services from Sony and Microsoft, approximately half the cost of Disney+, and one third the cost of Netflix.

Next, we assume a 2.3 tie ratio, meaning that Nintendo's average active user purchases slightly more than 2 games per year. We've deliberately set this tie ratio at an unreasonably low level to bring it approximately in line with the FY 2022 tie ratio forecast implied by management's current guidance. We say it's unreasonably low because FY 2022 is a great proxy for a below-average year going forward, whether measured in terms of Nintendo's software lineup³⁶ or its tie ratio to date (historically it's been considerably higher, balancing out above 3 prior to this year). Moreover, the tie ratio metric doesn't include any contribution from the sale of "indie" games that are only available via digital download, or any purchases of DLC or other forms of in game add-on content (despite the latter being one of the primary drivers of Nintendo's console peers' sales). Finally, it doesn't include any uplift from the incoming onslaught of "triple-A" multi-platform titles that should come to the Switch alongside the launch of more powerful hardware. To be clear, we believe none of these assumptions make sense in context of the increasingly digital state of the videogame industry today.

We also assume game sales will shift from roughly 70% physical, 30% digital in FY 2022 to 40% physical, 60% digital by FY 2027, while sales of DLC and in-game items drive only a 10-15% increase in average revenue per game, to roughly ¥6,000. With 55% gross margins on physical game sales and 90% on digital sales (higher than those of most game developers, since Nintendo owns its distribution) Nintendo's gross margin should increase from roughly 55% in FY 2022 to 65% by the end of our forecast period. Once again, we've set the bar nonsensically low: The uplift in revenue and profitability associated with Nintendo's ongoing shift

³⁵ We see Nintendo's recent decision to bundle new DLC for two of its most popular marquee game franchises with subscriptions to Switch Online as a bona fide game changer. It's transformed its new \$50 a year subscription tier – the N64 Expansion pack – from a "premium" add-on to a "must have" among Nintendo's two most engaged, active player bases. As a result, NSO should benefit from a step change in growth so significant that actual results to date may have already surpassed the 40% attach rate figure above.

³⁶ Recall that we should see a step change increase in the average number of games Nintendo releases in any given year due to (1) its recent restructuring of its portable and home game developers around a single platform and (2) its one-billion-dollar incremental investment in software, announced last November.

toward digital distribution should allow it to far surpass the assumptions embedded in this model.

We assume that the live service/mobile segment effectively goes nowhere, with annual earnings increasing to a mere ¥60bn by the end of our forecast period, despite “unlimited” at-bats, a structural cost advantage, Nintendo’s decision to spend \$900mn beefing up its game development frameworks and “live ops” gaming as a service (“GaaS”) expertise, its pivot in recent years to mobile GaaS, and the planned release of several new mobile titles in partnership with Niantic, among other factors.

We assign zero value to Nintendo’s entire IP Entertainment business. While totally ridiculous in principle, we’ve zeroed out billions of dollars’ worth of highly predictable, essentially pure-margin annual royalty revenue from (1) Nintendo’s theme park initiatives – as well as all future value creation related to (2) the hundreds of millions soon to be invested in visual content like movies and TV, as well as (3) its growing retail operations, (4) royalties from merchandise licensing, and (5) other potential contributors to its bottom line over time.

We assign zero value to potential new revenue streams from monetization of Nintendo’s intangible assets (namely its unrivaled and irreplaceable library of “gold-plated” IP) and its over \$15bn in non-core, long-term equity stakes.

Remarkably, Nintendo’s tangible asset value is approximately half of its current market cap, including cash and its investments in The Pokémon Company, Niantic, Bandai Namco, DeNA, and the Seattle Mariners major league baseball team (to name a few of Nintendo’s more valuable assets tucked away in its balance sheet).

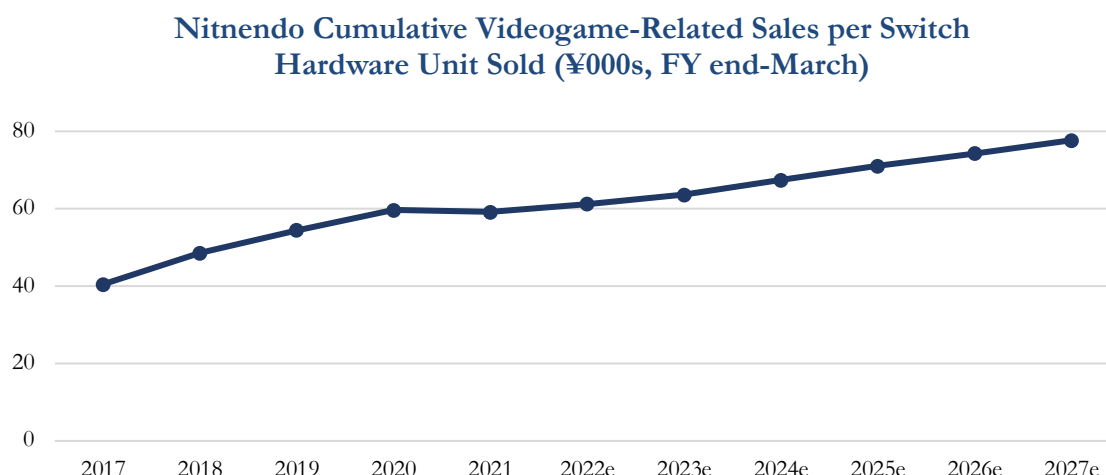
Considering the extremely high margin nature of its incremental revenues, **we assume that a conservative amount of operating leverage will kick in due to increasing scale**, with Nintendo’s fixed costs (R&D and G&A) staying flat as sales rise. However, we anticipate operating margins will increase linearly with gross margin improvement, from about 34% in FY 2022 to 45% in FY 2027. That assumption, like the others we’ve made, doesn’t even begin to make sense when placed in proper context, but once again, we’ve made these assumptions stupidly conservative by design.

1. Main KPIs

If you listen to Nintendo CEO Shuntaro Furukawa, as we do, there’s only one KPI that truly matters in judging Nintendo over the long run: **Cumulative Sales per**

Hardware Unit Sold (CSPHUS).³⁷ In 2019, Mr. Furukawa cited CSPHUS as the most important KPI for Nintendo. His rationale was that the traditional software attach rate no longer reflects the true state of Nintendo’s core business due to the rapid rise of (1) digital sales of indie games at a wide range of price points, and (2) various forms of in-game monetization and add-on content sales. These new revenue streams can’t be accounted for merely by tabulating the number of traditional software units sold. Rather, we need to consider how much revenue first- and third-party games, accessories, online services, DLC, and in-game add-on content (among other revenue streams) will generate per user over a single console’s lifetime to get a better sense of the unit economics of the Switch platform.

So how much is Nintendo’s CSPHUS? In its third year of life, FY 2019, the Switch had generated about ¥55,000 per Switch sold.³⁸ **As of this year, we anticipate Nintendo will reach about ¥60,000 in cumulative revenue per hardware unit sold, growing a modest 6% or so per year to roughly ¥80,000 five years out:**



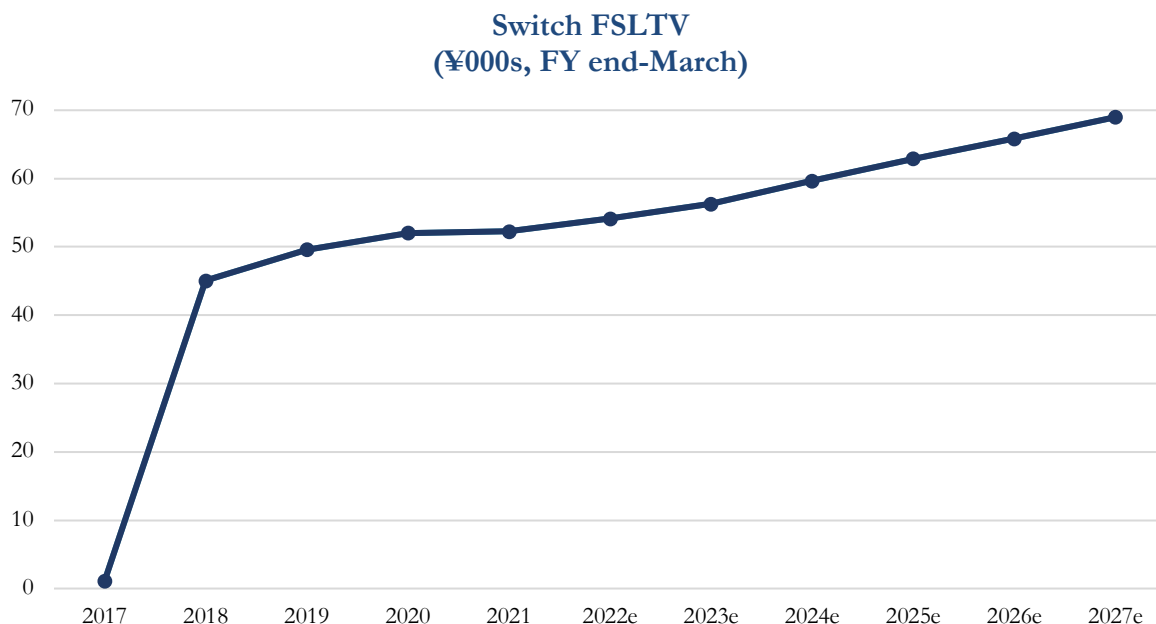
While annual playing users (see footnote 33) and CSPHUS are the key metrics Nintendo uses to track its own performance, we’ve added one more: “**Furukawa-style**” **LTV (FSLTV)**. We view it as an even better proxy for the Switch platform’s unit economics, and boy oh boy, it’s where Nintendo really shines. To calculate it, we

³⁷ CSPHUS now has some competition for the top spot given the annual playing users metric discussed above, and our own custom metric revealed below.

³⁸ While there are fundamental differences between the Switch platform and Nintendo’s old, traditional consoles, we note that after three years of life Nintendo’s incredibly successful Wii had generated only about ¥42,000 per hardware unit sold. So the Switch in 2019 already boasted a CSPHUS 30% above the Wii’s at the same time after its launch – and that gap has only grown in the interim.

take Mr. Furukawa's CSPHUS and strip out customer acquisition costs, or CAC, which we define as the cumulative sales, marketing and R&D expenses Nintendo has invested to acquire customers and drive sales for the Switch platform to date.

Given Nintendo's globally beloved, ubiquitous brand, games, and characters, it makes sense that its cumulative CAC per hardware unit sold is insanely low, yielding an LTV/CAC of roughly 10x . In any case, Nintendo's FSLTV graph looks like this:



A few things about our FSLTV projections should be kept in mind. First, the results it yields are highly conservative – not only because the assumptions in our Base Case model are conservative, but also because **not all of the sales and marketing expense in Nintendo's financial statements was spent on the Switch. We've also fully baked R&D into our FSLTV metric to account for Nintendo's content costs, despite it not ordinarily being included in CAC figures.**³⁹

Second, as the Switch platform continues to mature, we believe most of its users will remain loyal, “sticky” customers. For example, five years in, Switch user engagement is at an all-time high. Yet even though almost every acquired customer in the Switch

³⁹ We prefer extreme conservatism given the flaws in calculating conventional LTV to CAC ratios allow small misses re assumptions on fade/retention and the cost to retain users, throwing the utility of these figures out the door. The metric also doesn't account for how R&D- or G&A-intensive differing software businesses can be, either. Our methodology does what it can to eliminate these shortcomings.

family installed base remains “active” on the platform, **we assume only two thirds of current users will remain active by the end of our forecast period.** This assumption is highly conservative considering the trend thus far, not to mention that the platform’s installed base of active users as of the most recent quarter continues to compound healthily, growing 20% YoY.

Third, **Nintendo’s software-related digitization initiatives are barely midway through their adoption curves.** In other words, when it comes to the digital shift of its sales mix, there’s a lot more room left to run. For this reason alone, we believe that our Base Case estimates of Nintendo’s future profitability will prove to be grossly understated. **Basically, we’ve assumed the unstoppable forces driving the digitization of Nintendo’s sales have been stopped.** (For what it’s worth, of all the ridiculous premises underpinning our estimates, we think this one is the most absurd.)

Fourth and finally, take a minute to internalize the sheer beauty of the Switch platform’s unit economics. After all, **Nintendo’s customer lifetime value is conservatively more than ten times the cost of acquiring those customers,** a data point that puts Nintendo in truly rarified air in the software industry despite all the conservatism built into our assumptions.

The fact is that Nintendo’s customer economics are superior to those of profitable software companies expected to grow revenue and gross profit at similar rates, a high-quality business cohort that trades at dramatically higher valuations than Nintendo does today (even after the fear of higher rates cut their elevated valuations in half)⁴⁰.

Keep in mind that Nintendo’s steady-state margin profile at maturity – and the probable terminal multiple the market awards it down the road – are dramatically more predictable than what you typically see in software, a big deal if only because the downside of getting those factors wrong is unusually severe. Better yet, Nintendo’s customer economics are remarkably stable. These jaw dropping figures certainly aren’t a flash in the pan.

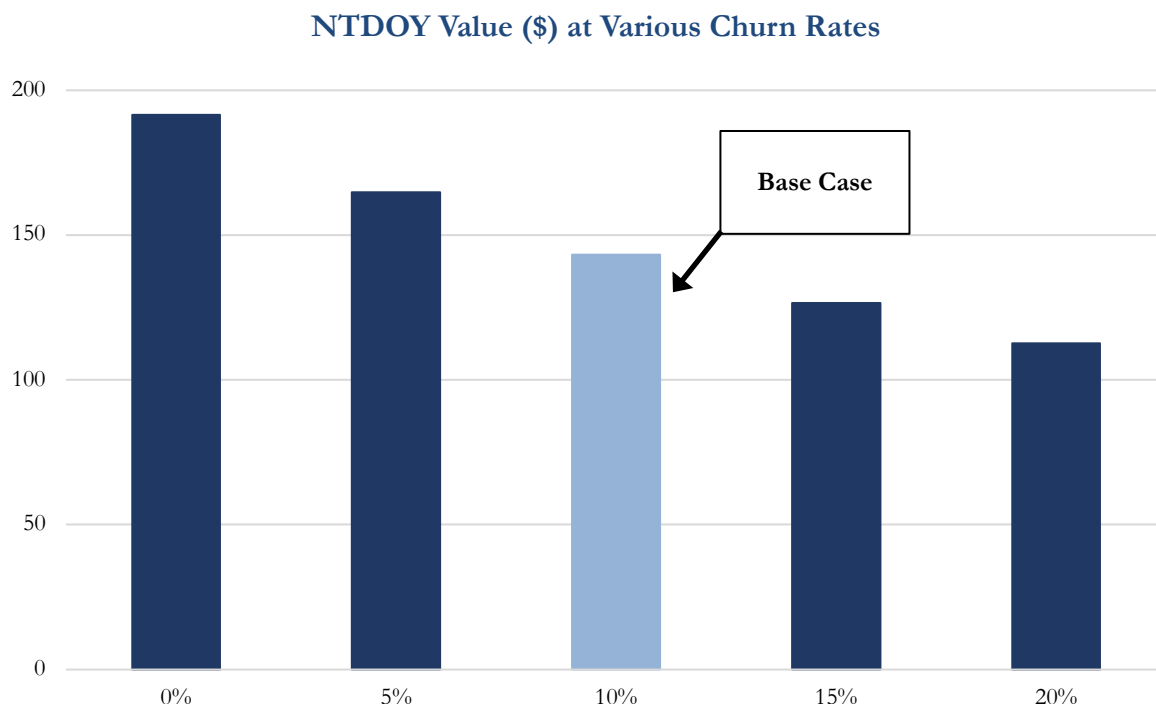
For example, if we look at Nintendo’s cohort analysis to see what that tells us about the relationship between past purchase behavior and future purchase behavior, in this case, by examining the ratio between active devices and cumulative devices sold, we get a reliable measure of user satisfaction for the platform. And with outstanding results. This is because the active device ratio tells us exactly what we hope to know as investors: Are Switch devices are being used, and if so, for how long (obviously usage that is both frequent and long-lasting is better and vice versa). In the end, the active

⁴⁰ While we’re on the topic, this wonderful piece from our friends at Voss Capital is well worth a read: <https://vosscapital.substack.com/p/the-state-of-software>

device ratio is a far better barometer of user satisfaction than satisfaction surveys and other useless attempts to measure outcomes based on words and subjective experiences. This is because the ratio measures actions based on interactions with the platform over time and ultimately, the predictability and staying power of any business comes from a “guarantee” that activity is firmly tied to purchase behavior. At any rate, this is all more good news as the relationship between engagement and profit per user at Nintendo (and the videogame industry in total) is both linear and well established.

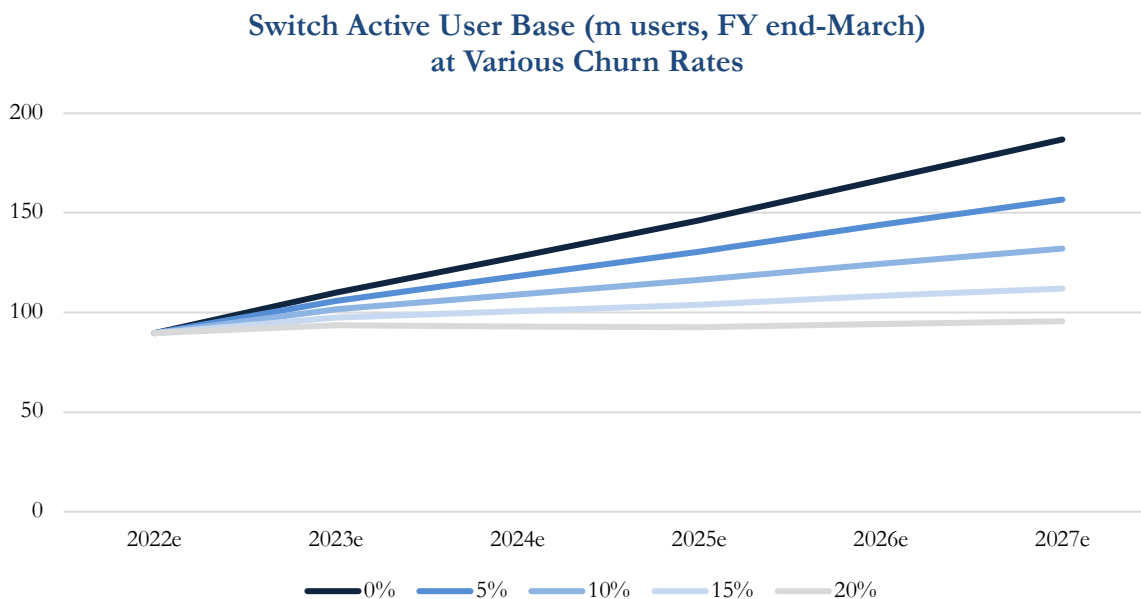
With all that said, we aren’t trying to argue that a doubling of its sales and marketing spend would result in a doubling of demand at that same CAC. In fact, we’re pretty certain that the impact of doubling of their ad budget to increase active users from their paid channel (i.e., advertising) would be limited. Our point here is simply to shine a light on just how good of a business Nintendo is today, and how that fact is routinely ignored by investors despite its objectively outstanding underlying economics and companywide profitability, both of which should markedly improve from present levels with time.

Moving on to our actual earnings model, we submit below a chart estimating Nintendo’s true value per share based on various levels of device churn, followed on the next page by a summary (in yen) of our Base Case model over our discrete forecast period, and finally a chart showing how different levels of churn affect our estimates of the Switch’s active user base:



Base Case model

JPY	FY'20	FY'21	FY'22E	FY'23E	FY'24E	FY'25E	FY'26E	FY'27E
Revenue	¥ 1,308.5	¥ 1,758.9	¥ 1,632.5	¥ 1,826.7	¥ 1,689.3	¥ 2,038.5	¥ 2,217.6	¥ 2,401.6
Revenue Growth	9.0%	34.4%	(7.2%)	11.9%	(7.5%)	20.7%	8.8%	8.3%
Hardware Revenue	¥ 1,050.1	¥ 1,356.0	¥ 1,243.7	¥ 1,344.1	¥ 1,083.9	¥ 1,289.1	¥ 1,296.2	¥ 1,289.1
Growth		29.1%	(8.3%)	8.1%	(19.4%)	18.9%	0.5%	(0.5%)
Switch Hardware Revenue	¥ 654.0	¥ 874.5	¥ 780.4	¥ 875.0	¥ 595.0	¥ 787.5	¥ 787.5	¥ 787.5
Growth		33.7%	(10.8%)	12.1%	(32.0%)	32.4%	0.0%	0.0%
Physical Games Hardware Revenue	¥ 395.6	¥ 459.6	¥ 463.3	¥ 469.1	¥ 488.9	¥ 501.6	¥ 508.7	¥ 501.6
Growth		16.2%	0.8%	1.3%	4.2%	2.6%	1.4%	(1.4%)
Average Switch Install Base	46.7	73.6	98.2	122.3	142.3	162.7	185.2	207.7
Switch Install Growth (units)		26.9	24.7	24.0	20.0	20.4	22.5	22.5
Growth		57.5%	33.6%	24.5%	16.4%	14.3%	13.8%	12.2%
Annual Active Switch Base	41.5	68.8	89.6	101.6	109.1	116.3	124.6	132.1
% of Total Install Base	88.9%	93.5%	91.2%	83.1%	76.7%	71.5%	67.3%	63.6%
Tie Ratio	3.5	3.1	2.3	2.3	2.3	2.3	2.3	2.3
Growth		(11.9%)	(26.5%)	0.8%	0.0%	0.0%	0.0%	0.0%
Sales Per Hardware Unit (Cume, Yen)	¥ 59,637	¥ 59,133	¥ 61,225	¥ 63,638	¥ 67,404	¥ 71,032	¥ 74,264	¥ 77,710
Growth		(0.8%)	3.5%	3.9%	5.9%	5.4%	4.5%	4.6%
CAC Per Hardware Unit (Cume, Yen)	¥ 7,616	¥ 6,862	¥ 7,072	¥ 7,335	¥ 7,741	¥ 8,118	¥ 8,417	¥ 8,726
Growth		(9.9%)	3.1%	3.7%	5.5%	4.9%	3.7%	3.7%
LTV Per Hardware Unit (Cume, Yen)	¥ 52,021	¥ 52,271	¥ 54,152	¥ 56,303	¥ 59,663	¥ 62,914	¥ 65,847	¥ 68,984
Growth		4.9%	0.5%	3.6%	4.0%	6.0%	5.4%	4.8%
Software Revenue	¥ 204.1	¥ 344.1	¥ 332.1	¥ 420.1	¥ 542.6	¥ 686.5	¥ 858.6	¥ 1,049.7
Growth		68.6%	(3.5%)	26.5%	29.2%	26.5%	25.1%	22.3%
NSO Subs	12.1	21.3	32.2	36.2	40.0	43.8	48.1	52.3
NSO Growth		75.3%	51.7%	12.3%	10.3%	9.5%	10.0%	8.8%
NSO Attach Rate	29.2%	30.9%	36.0%	35.6%	36.6%	37.6%	38.6%	39.6%
ARPU	¥ 2,436.0	¥ 2,448.0	¥ 2,490.5	¥ 3,043.0	¥ 3,723.0	¥ 4,403.0	¥ 5,083.0	¥ 5,763.0
Mobile and Cards	¥ 51.3	¥ 57.1	¥ 54.1	¥ 59.9	¥ 60.2	¥ 60.2	¥ 60.2	¥ 60.2
		11.3%	(5.2%)	10.7%	0.6%	0.0%	0.0%	0.0%
Average Mobile MAUs	118.8	132.5	122.5	135.0	135.0	135.0	135.0	135.0
Growth		11.6%	(7.5%)	10.2%	0.0%	0.0%	0.0%	0.0%
IP - Parks and Movies	¥ -	¥ -	¥ -	¥ -	¥ -	¥ -	¥ -	¥ -
Hardware % of Revenue	80.2%	77.1%	76.2%	73.6%	64.2%	63.2%	58.4%	53.7%
Software % of Revenue	19.8%	22.9%	23.8%	26.4%	35.8%	36.8%	41.6%	46.3%
Switch Console % of Revenue	50.0%	49.7%	47.8%	47.9%	35.2%	38.6%	35.5%	32.8%
Software/Games % of Revenue	50.0%	50.3%	52.2%	52.1%	64.8%	61.4%	64.5%	67.2%
EBITDA	¥ 361.9	¥ 646.2	¥ 577.2	¥ 589.4	¥ 653.6	¥ 787.3	¥ 917.1	¥ 1,056.3
EBITDA Margin	27.7%	36.7%	35.4%	32.3%	38.7%	38.6%	41.4%	44.0%
EBITDA Growth	39.6%	78.5%	(10.7%)	2.1%	10.9%	20.5%	16.5%	15.2%



Note that the average installed base figures in the table above are derived from our year-end console sales forecasts discussed in the writeup.⁴¹

So what is the implied return of this investment case? Incredibly, even after being ruthless with our assumptions for the dedicated console segment, and assigning zero value to almost every earnings engine outside of that, we find that investors in Nintendo would *still* walk away with an annualized IRR of 19.8%, inclusive of dividends.

Moreover, the above outcome assumes terminal multiples for EBIT and FCF of 12.5x and 15x, respectively – well below those of companies of comparable quality, to say nothing of the average businesses that make up the bulk of the leading market indices. We believe a clearly superior, dominant market leader like Nintendo, with best-in-class IP, recession-resistant, high-incremental-margin revenue, and above-average growth rates, should never trade at such a steep discount to comparable businesses, let alone the S&P 500.

Recent transactions in the videogame space suggest that our view is correct. Nintendo currently trades at just under 12x earnings ex cash, but acquisitions of other (and in our view, lesser) game companies like Ubisoft, Take Two, and Activision have recently been announced or completed at forward multiples more than *twice* that of

⁴¹ For example, the table shows that the average Switch installed base in a given year grew from 73.6m in FY 2021 to 98.2m in FY 2022, for a 24.7m unit increase. However, our modeling and company guidance show year-end figures, and the end-FY 2021 figure of 84.6m increased by 23m to 107.6m at end-FY 2022.

Nintendo today. (The \$70bn Microsoft recently paid for Activision Blizzard is well in excess of Nintendo's total enterprise value, even though Activision Blizzard's IP and core game franchises are obviously and dramatically less valuable than Nintendo's.)

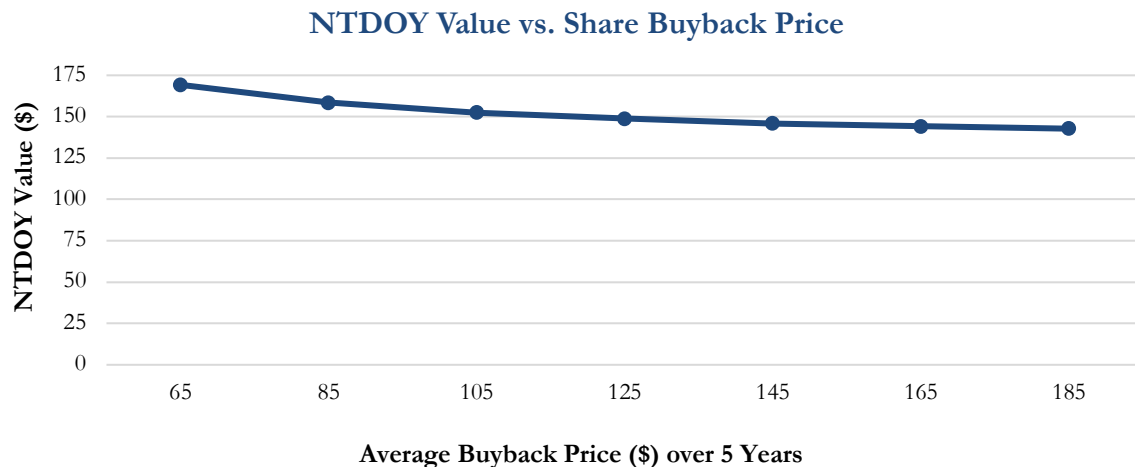
In short, the level of downside protection embedded in Nintendo's current price is extraordinary – and again, that's *before* assigning any value to the more than \$15bn in non-core long-term equity stakes on its balance sheet. In all seriousness, Nintendo has perhaps the largest margin of safety of any investment we've ever seen relative to its absolute quality.

2. Capital allocation optionality via share buybacks and more

Nintendo has proved open to modest share buybacks in the past, and especially the recent past. So, with all the corporate governance changes afoot in Japan (as discussed above), let's think about what a more "western" approach to share buybacks would look like for Nintendo. For the sake of argument, let's assume that Nintendo doesn't even touch its gargantuan cash pile and continues paying out 33% of consolidated operating profit (or a consolidated dividend payout ratio of 50%, whichever is greater) in dividends throughout our discrete forecast period. Then let's assume it decides to use the entirety of its free cash after dividends to repurchase shares. (Given the contextual backdrop, we think it's reasonable to assume that Nintendo would return capital to shareholders at a rate in line with its annual earnings power.)

The results are impressive. Over the last 12 months, Nintendo has generated over \$3bn in cash after dividends, on an operating margin of about 36.5%. But the annual excess cash available for buybacks would be quite a bit more than that if Nintendo's business continues to evolve as we expect. In fact, even if operating margins merely tread water, Nintendo's free cash generation would *triple* over the next five years. In this scenario Nintendo would still generate a cumulative \$20bn or more in cash after dividends by 2028 – not bad, given that its current market capitalization sits at roughly \$54bn today. So a capital return program characterized by increasing dividends and continuous equity shrink would be extremely accretive to shareholders, even at much higher share prices than today's.

To show just how accretive, we've run a sensitivity analysis of our Base Case expectations against an average share repurchase price over our discrete forecast period. And no matter how you slice it, a buybacks-plus-dividends one-two punch would result in an outstanding outcome for shareholders. For instance, if Nintendo's ADR price rises only slightly to \$85, and its business evolves approximately in line with our thinking, share buybacks would eliminate roughly 15% of Nintendo's shares outstanding, increasing our estimate of its value per ADR to \$160 and improving our estimated annualized IRR to roughly 22.5%!



Some of you might say such a buyback scenario is unlikely. And if we were talking about Nintendo five, or even three, years ago, we'd probably agree. But we believe that today a share repurchase program like this is far more likely than most investors expect, considering not just the recent dramatic (and permanent) improvements to Nintendo's business model, but also the coming wave of Japanese corporate governance and capital management reforms we've already discussed. After all, unless Nintendo adopts a buyback strategy like the one we've outlined, over \$20bn in excess cash will pile up on its balance sheet, that is, unless it puts it to some other accretive use.

Speaking of other uses, we'd like to see Nintendo go far beyond a share repurchase program like we've just discussed. In our ideal world, it would acquire the rest of Creatures Inc, or buy Game Freak outright. Either move would consolidate its control of The Pokémon Company (TPC), which makes enormous sense on so many levels it's hard to know where to start. TPC is arguably the most valuable media entertainment franchise in the world, while Game Freak already develops almost exclusively for the Switch, literally working out of offices on Nintendo's corporate campus.

While a TPC acquisition might seem like a pipe dream, but in fact it would be almost exactly like Nintendo's recent acquisition of Systems Research and Development (SRD). SRD, like TPC, shares Nintendo's corporate culture and works out of Nintendo's offices. It's been programming for Nintendo for over four decades, playing a key role in creating games from classics like Mario and Zelda straight through to the blockbuster hits of the present day. We think its acquisition was clearly meant to help Nintendo sell more first-party videogames. A TPC acquisition would accomplish much the same, clawing back Pokémon software sales in Japan, among many other massive and hugely lucrative recurring revenue streams in merchandise licensing, retail store operations, TV animation, and film. And let's not forget that

Nintendo is the sole owner of all Pokémon-related trademarks. In other words, The Pokémon Company doesn't own the Pokémon brand – Nintendo does. TPC merely acts as its agent.

In any case, for Nintendo, nothing could be more natural or long overdue than a large-scale consolidation of its sister companies around the globe⁴² – but especially those in Japan, since they tend to be the most closely aligned with Nintendo's corporate culture. And there is no better, more natural place to start than TPC. But while we're at it, we'd like to see Nintendo acquire a variety of its other sister studios like Hal Laboratories (*Kirby*), Bandai Namco (*Super Smash Bros.*), and Koei Tecmo (*Fire Emblem*). DeNA, Square Enix, Capcom, and Sega could be snapped up too. An acquisition blitz like that would be icing on the value creation cake.

But to unlock shareholder value in a truly unprecedented manner, Nintendo could go beyond buybacks and acquisitions. It could spend, say, a billion dollars to build out a global network of high-return retail stores like those it already has in Tokyo and New York. It could spend another billion or so above and beyond its recent announcements investing in visual content like movies and TV. (For example, we think a tie-up with Netflix or another studio on the live action side of the feature film business would be pretty darn sweet.) Nintendo could also start monetizing its various cross-shareholdings in Japanese banks as well as any shares of its strategic partners it doesn't end up acquiring, as well as its remaining stakes in the Seattle Mariners and Niantic – in the case of the latter, preferably by spinning out its stake after that company's expected IPO.⁴³ Or it could just simply spend money on developing more triple-A, system-selling games.

Any actions like those would show the market that Nintendo means business when it comes to making better use of its excess cash and maximizing its return for shareholders. The whole swoon-inducing thought experiment makes us weak in the knees - and maybe, just maybe, the views of Nintendo's management and Crossroads on these issues aren't as far apart as it first may seem. For example, we don't appear to be alone in our thoughts on the nascent opportunity embedded in Japanese corporate equities more generally. Indeed, it appears the Yamauchi family office, i.e., the investment firm that famously manages the money of Nintendo's founding family, appears to share our belief that Japanese corporate governance is indeed turning over

⁴² Nintendo seems to have started down this path with its January 2021 acquisition of Canada-based Next Level Games, the creator of key Nintendo franchises like *Luigi's Mansion 3* and *Mario Strikers: Battle League*.

⁴³ Nintendo's stake in Niantic could easily be worth more than Nintendo's entire current market cap in ten years' time. Niantic just completed its latest financing round, raising \$300mn at a \$9bn valuation, putting Nintendo's 20% stake at \$1.8bn. Niantic's CEO has stated multiple times that he will take the company public. That puts a value-realizing event on our investment horizon. Niantic remains one of our favorite hidden Nintendo call options.

a new leaf. The family office recently took control of Taiyo Pacific Partners, a U.S. fund that tries to engage with Japanese companies on boosting corporate value.⁴⁴ Either way, consider us intrigued.

All that in mind, Nintendo could execute a comprehensive value-unlocking plan like that today if it wanted to. Will it? Almost certainly not – at least not to that degree. But you can forgive us for dreaming. We won't torture ourselves by modeling where Nintendo's share price would stand if the company aggressively unlocked value across the board, but something on the order of a tenfold rise from current levels over the next decade strikes us as on the low side of reasonable. Nonetheless, a capital return program in which Nintendo simply starts repurchasing shares in line with its earnings capacity would be more than enough to make us giddy. It's a start, at the very least.

C. The Continuous Iteration Model: more realistic, yet still conservative

On the next page, our second valuation model, which we call the Continuous Iteration Model (CIM), paints a somewhat more realistic picture of Nintendo's corporate net worth five and ten years from now.⁴⁵

The main difference between the CIM and our Base Case scenario is that the CIM uses more sensible inputs for Nintendo's ongoing shift to digital distribution of its software. It also models far more likely (yet still unquestionably conservative) outcomes for Nintendo's IP Entertainment and mobile/live services businesses. As the sensitivity table on page 81 makes clear, all these changes make quite a difference.

The first thing to notice is how software quickly becomes the dominant driver of Nintendo's revenue and earnings. For most of the last decade, Nintendo lagged competitors on online services and digital distribution of games and game content. However, we argued that Nintendo was poised to catch up quickly – and that it had a lot of upside to look forward to, given how much of the curve it still had to climb. Today, we're nearly halfway to the finish line.

Of course, what matters isn't where Nintendo is now, but where it will be in five years. And as the CIM makes clear, the massive profit boost from Nintendo's continued transition to digital distribution is virtually certain to trigger a massive rerating of its shares. We can't know exactly when investors will finally give Nintendo credit for this dramatic improvement in the quality of its earnings, but for various reasons discussed throughout this update, we believe that time is near.

⁴⁴ <https://asia.nikkei.com/Business/Business-deals/Nintendo-heirs-buy-U.S.-Japan-stock-fund-Taiyo-Pacific>

⁴⁵ Our CIM is based on a model prepared by a contact of ours at DJY Research, modified to reflect our own assumptions. DJY Research's subscription service can be found at <https://djyresearch.com>. If you love first class, deep dive analyses of Asian equities, it's the best we're aware of.

Revenue Build: Continuous Iteration Model (CIM)

<i>(in bns of yen)</i>	2022	T5	T10
Hardware Revenue Build:			
Hardware Unit Sales	23mn	22.5mn	22.5mn
<i>Implied ASP</i>	¥38,953	¥35,000	¥35,000
Cumulative Install Base	107mn	208mn	320mn
<i>CAGR</i>		14%	9.0%
Active User Base	102mn	132mn	160mn
<i>CAGR</i>		5.4%	3.9%
Hardware Revenue	896bn	788	788
<i>as % of Platform Sales</i>	42-/\$	18-/\$	14-/\$
Software Revenue Build:			
Gaming Revenues:			
Video Game Unit Sales*	231mn	304mn	312mn
<i>Average Selling Price</i>	¥3,150	¥5,000	¥5,750
Game Sales per Installed Unit	2.3x	2.3x	1.95x
Video Game Revenues	727bn	1,519bn	1,794bn
Nintendo Switch Online Subscription:			
Estimated Subscribers	35mn	57mn	69mn
<i>% of Install Base**</i>	34%	43%	43%
Average Annual Cost	¥2,400	¥6,750	¥8,750
Switch Online Subscription Revenue	83bn	383bn	602bn
Software Revenue	804bn	1,903	2,396
<i>as % of Platform Sales</i>	47%	71%	75%
Total Switch Platform Sales	1,700bn	2,691	3,184
<i>CAGR</i>		0/\$	3%
Mobile & IP Revenue Build:			
MAUs	200mn	300mn	400mn
Paid Penetration	8%	9%	15%
ARPU	¥2,319	¥2,551	¥2,806
Mobile Gaming Revenue	37bn	69bn	168bn
IP Entertainment Revenues	20bn	80bn	100bn
Mobile and IP	57bn	149bn	268bn
<i>as % of Total Sales</i>	3%		12%
Total Nintendo Revenue	1,759bn	2,840bn	3,452bn
<i>CAGR</i>		0/\$	3\$

* Doesn't include physical game sales

** NSO steady state attach rate based on the PlayStation ecosystem as of the most recent quarter

NOPAT Build: Continuous Iteration Model (CIM)

<i>(in bns of yen)</i>	2022	T5	T10
Gross Margins:			
Hardware Margins	30%	20%	20%
Software	81%	85%	90%
Mobile & IP	81%	85%	85%
Gross Profit	970bn	1,901bn	2,541bn
<i>Gross Margin</i>	<i>55%</i>	<i>67%</i>	<i>74%</i>
R&D	93bn	142bn	173bn
<i>% of Sales</i>	<i>5%</i>	<i>5%</i>	<i>5%</i>
S&M	84bn	142bn	173bn
<i>% of Sales</i>	<i>5%</i>	<i>5%</i>	<i>5%</i>
Other SG&A	152bn	341bn	414bn
<i>% of Sales</i>	<i>9%</i>	<i>12%</i>	<i>12%</i>
Operating Profit	641bn	1,277bn	1,783bn
Operating Margin	36%	45%	52.0%
Tax	201bn	400bn	559bn
<i>Tax Rate</i>	<i>31%</i>	<i>31%</i>	<i>31%</i>
NOPAT	440bn	876bn	1,224bn
<i>CAGR</i>		<i>15%</i>	<i>7.0%</i>

1. CIM assumptions

Let's dig into the CIM and take a deeper look at its assumptions:

We've assumed a cyclical "trough" tie ratio of 2.3 for the T5 period (in line with our Base Case scenario, and for similar reasons) **and slightly less than 2.0 for the T10 period.** We further assume a steady-state 85% digital and 15% physical game sales at maturity, plus incremental sales of DLC and in-game items, drives a 75% increase in Nintendo's selling price per digital game to ¥5,000 over the next 5 years and ¥5,575 for the five years after that, effectively giving Nintendo some credit for the digitalization of its sales. Note too that while the CIM model counts the 85% of game sales that we expect to take place digitally, we've left out any contribution from physical game sales, again, just for conservatism's sake.

We assume active NSO subscribers reach 57m by year-end 2027, and 69m by 2032, equating to an attach rate of 43% at maturity, in line with the current attach rate of Sony's PlayStation ecosystem. We also assume NSO's ARPU increases to \$60 over the next five years and \$100 in the five years after that. The \$60 ARPU target assumes a price at the absolute low end of what Sony and Microsoft charge for online gameplay via their PlayStation Plus and Xbox Live services – a price that, once again,

is in line with our Base Case. The \$100 target assumes ARPU rises meaningfully from there, while remaining comfortably below the \$119 annual fee that Sony and Microsoft charge for their Netflix-like streaming services, PlayStation Now and Game Pass.

For Nintendo's mobile/live service operations, we assume \$600m in revenue for period T5, and we think there are a variety of ways for Nintendo to easily reach that target. After all, we're nearly there already. From T6 through T10, we assume some decent success at roughly \$1.5bn per year. While by no means a knockout success, we do believe it's a reasonable estimate given Nintendo's recent investments and its renewed dedication to the space on the back of last year's announced partnership with Niantic. But again, this outcome is nothing extraordinary. We think we'll get there via some combination of GaaS and the most conservative scenario laid out in our original letter. But get there we should.

We assume \$700m and \$875m in IP Entertainment revenue in the T5 and T10 steady-state periods, respectively, including about \$351m from theme parks.

It's safe to say that a family-friendly hit movie with global appeal on the level of Spider-Man or Harry Potter can easily rack up over \$1bn in total box office receipts. Granted, handicapping the returns of films that haven't been released yet is tricky. But this is no ordinary IP we're talking about, and no run-of-the-mill film studio. Illumination has averaged returns on capital deployed of nearly 5x over the years. The consistency and durability of its returns over its 10 feature films to date is unlike anything we've ever seen in the movie business, whether in Hollywood or elsewhere, as the chart on the next page makes clear.

In short, while it will take some time to realize, we believe there is more than enough latent potential embedded in the Nintendo-Illumination partnership to result in at least one hit movie per year.

As far as theme parks, by the end of 2027 there will be four Super Nintendo Worlds open. While Super Nintendo World Japan technically opened to the public in March of last year, three more are scheduled to open (in Hollywood, Orlando, and Singapore) over our forecast period, with at least two "lands" in each (e.g. a new Donkey Kong area is expected to open at Universal Studios Japan in 2024, and Nintendo recently noted that new areas are being planned for Hollywood, Orlando, and Singapore as well). Moreover, these four Universal Studios locations typically see 39m visitors per year, with each visitor spending about \$100 on tickets. If we assume a 9% royalty rate to Nintendo on every ticket sold, Nintendo should earn roughly \$351m in pure-margin royalty revenue from all four parks, excluding any incremental profit from merchandise sales.

Illumination Box Office History

	Production Budget (\$M)	Worldwide Box Office (\$M)
Despicable Me	69.0	543.5
Hop	63.0	188.4
Dr. Seuss 'The Lorax	67.5	350.9
Despicable Me 2	76.0	975.2
Minions	74.0	1,159.6
Secret Life of Pets	75.0	885.3
Sing	75.0	632.5
Despicable Me 3	75.0	1,032.6
Dr. Seuss 'The Grinch	75.0	514.6
Secret Life of Pets 2	80.0	446.3
Average	73.0	672.9
MOIC ex marketing		9.2x

Avg Marketing budget*	73.0
Avg Production + marketing	145.9
Avg Illumination MOIC	4.6x

* Marketing costs for "tentpole" films can sometimes exceed their production costs, but typically it's a 1:1 ratio.

Estimated MOIC for Super Mario**	7.4x
---	-------------

** Despicable Me scenario (avg sequels and spins)

The exact details of Nintendo's contract with Comcast (Universal's parent company) are unknown to us, but we've managed to find hard data on the economics of similar arrangements, such as the initial terms struck with Comcast to create Harry Potter-based attractions early in the two parties' relationship. We've also found newer templates based on a more mature partnership where the IP was of comparable quality and the terms were reflective of multiple "lands" being built in each park after the initial attractions proved successful.

While there are a variety of potential scenarios we could analyze, with Tokyo opening last March, and a planned Donkey Kong expansion already in the works alongside new areas planned for its parks in Hollywood, Orlando, and Singapore, we think a high-single-digit royalty on ticket sales is conservative given the power of Nintendo's IP to drive attendance. Moreover, the odds of a Super Nintendo World eventually opening in Beijing within our forecast period strikes us as quite probable. And given Universal Studio's Beijing typically sees 20m visitors per year, the annual, recurring, highly predictable royalties it would generate for Nintendo could approach \$180m a year in steady state should this prediction come to pass. Consequently, if we capitalize the combined \$531m in highly resilient, pure-margin royalty revenue at 20x, the implied uplift to

Nintendo's equity value is \$10.6bn, or slightly more than 25% of what we're paying to own the entire enterprise today.⁴⁶ Not bad, as free options go:

Theme Parks

	Annual Visitors (mn)
"Parks Under Contract"	
Japan	14.5
Hollywood	9.1
Orlando	10.9
Singapore	5
Total Annual Visitors	39
Avg. Ticket (\$mn)	\$100
Royalty Rate	9%
Theme Park Royalty Revenue (\$mn)	351mn
Implied Equity Value Creation @ 20x	7.02bn

Beijing Option

	Annual Visitors (mn)
Beijing	20
Average Ticket (\$mn)***	\$100
Royalty Rate	9%
Beijing Theme Park Royalty Revenue (\$mn)***	\$180mn
Total Theme Park Royalty Revenue @ Maturity (\$mn)	
	\$531mn
Implied Equity Value Creation @ 20x	\$10.6bn

In sum, movies and theme parks at maturity could easily hand Nintendo about \$1bn a year in essentially pure-margin recurring revenue at maturity, a windfall substantially in excess of the IP Entertainment estimates embedded above.

2. CIM key takeaway: Operating leverage from digital distribution of software

The CIM really shows the cumulative impact of a business model transformation in which the installed base of the Switch platform never resets and the transition to

⁴⁶ Super Nintendo World is also a one-of-a-kind laboratory-like testing ground for real-world applications for metaverse technologies, both inside and outside the parks. As one recent Motley Fool article pointed out, the Mario Kart attraction allows visitors to fire shells at digital obstacles while driving around a real track, and visitors can collect coins, stamps, and power-ups around the park with a wristband that is synchronized to a mobile app. What will ultimately come from these early experiments is anyone's guess, but Nintendo's edge in this area over other game companies appears to be significant.

digital distribution is realistically represented. Not only does Nintendo benefit from an enormous amount of operating leverage as software sales quickly become its dominant source of revenue, but the impact of annual hardware sales on Nintendo's P&L becomes increasingly irrelevant.

The implied annualized IRR in the sensitivity table on page 81 makes this point quantitatively. The table highlights the differences in IRR between a future in which Nintendo sells 22.5m units of hardware in perpetuity versus a truly draconian scenario in which it sells just 15m. For example, over the next five and ten years, the delta in annualized IRR between the two is only 1% a year (27% vs. 26% and 18% vs. 17% per year with the 15m unit figure over the T5 and T10 scenarios). That's the power of the Apple Model at work – and it makes a mockery of the sell side's "peak Switch" fears.

Of course, all of this is exactly what one would expect, given Nintendo's transition toward an iterative hardware model and some reasonable estimates regarding ancillary royalty revenue thanks to better monetization of its best-in-class IP. We estimate that by the end of fiscal 2027, software will represent about 71% of Nintendo's total revenue base. Interestingly, as things stand, digital already makes up roughly two thirds of Sony's game division's total revenue, with another 25% or so attributed to hardware sales – figures that dovetail nicely with where we expect Nintendo's software-hardware mix to stabilize over the next five years.

All that brings us to our key takeaway: Over the next 10 years, Nintendo's 36% operating margin should dramatically expand toward 55% as (1) its distribution costs plummet and (2) the transition to digital distribution of its software normalizes at a level consistent with that of its console maker and software publisher peers.

3. Even in the CIM, our assumptions are highly conservative

While the assumptions underpinning our CIM model are more realistic than those of our Base Case model, the odds that Nintendo falls short of the assumptions here remain quite low. If any of our estimates feel aggressive, keep in mind that Nintendo has posted comparable results in the past. For example, no family of Nintendo portables (e.g. the Game Boy or DS) has *ever* sold less than 200m units. And back in its Wii days, Nintendo managed to sell a truly mind-boggling 57m units of hardware in a single year.

If the Switch family at maturity merely reaches the *midpoint* of the lifetime unit sales of the Gameboy and DS families, the implied 215m in cumulative sales would still be

higher than the 207m figure underpinning our CIM – and that’s before attributing any value to hardware sales from Nintendo’s home consoles.

But why should we compare Switch unit sales to portable consoles alone, given the “home and portable in one” nature of the Switch platform? The answer is that we shouldn’t. Both of Nintendo’s historical platforms should be taken into account if the goal is to be fair – and if we do, the contrast with our CIM assumption gets even more stark: Lifetime home and portable hardware sales of the Wii and DS family generation clocked in at over 330m units – and remember, these are the totals from a *single* generation of hardware. And if we group the last 3 generations of Nintendo’s home and portable hardware together – probably the most apples-to-apples comparison possible – then Nintendo sold over 442m devices in total. That’s more than *twice* the level used in our CIM.

In short, Nintendo’s historical sales suggest that Switch family unit sales could far surpass the CIM’s assumptions. And while this is hardly an exercise in precision, it does provide at least a basic sanity test that the figures underpinning the CIM remain more than fair.

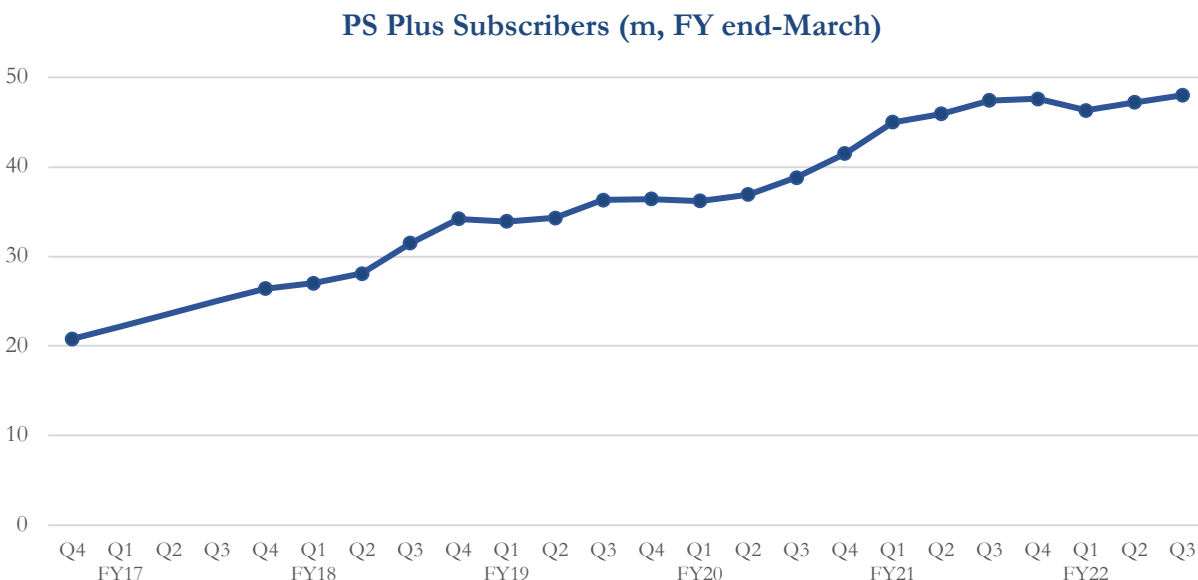
It’s a similar story for software (videogame) sales. We’ve estimated total software unit sales of 319m by the end of our forecast period. Again, let’s apply a basic sanity test by noting that in the Wii/DS days Nintendo sold over 400m units of software in 2009 alone.⁴⁷ We’ll just leave things there.

Finally, when it comes to our estimates for NSO, particularly our thoughts on its natural saturation point in terms of total “active” members at maturity, we don’t think we’re even close to the line. Despite our 57m member estimate five years out already being heavily penalized by our churn assumptions, Nintendo’s recent bundling of two of its top DLCs with the higher-priced N64 Expansion Pack may have already gotten us close to our mark.

As a sanity check, let’s look at Sony. When it comes to inducing users to join its online game subscription service, Sony lacks Nintendo’s first-party DLC “carrot.” Yet, as the chart on the next page shows, Sony’s PlayStation+ service today has over 48m active members on an active user count barely below Nintendo’s T5 scenario.⁴⁸

⁴⁷ Since the NES days, Nintendo has released 384 games that have individually sold over 1m units. In fact, the company has shipped a total of more than 2.1bn games since the NES’s release.

⁴⁸ https://twitter.com/ZhugeEX/status/1488760770854801408?s=20&t=hMI57ARqcyJsYvm_2DW6kw (Hat tip to Daniel Ahmed of Niko Partners.)



We also note that the total number of PlayStation+ subscriptions has grown more or less in parallel with Sony's installed base of hardware, year after year – just as we've seen at Nintendo. Then there's Microsoft, whose Xbox Live service had over *100m* users as of January 2021. Enough said.

D. Putting a value on it

With more reasonable estimates for revenue, operating margins, and interim cash generation, we're looking at a conservative 27% IRR over the next five years and an 18% compounded return over the next decade. Not too shabby, given the enormous latent optionality embedded in Nintendo's business and a general set of inputs that could easily prove far too low in the end.

Of course, should Nintendo return capital to shareholders in line with its annual earnings capacity via some combination of buybacks and dividends, the implied IRR over the next decade could end up being far higher based on improved capital management as well. Nonetheless, as the sensitivity table below illustrates, capitalizing Nintendo's NOPAT in steady state at 15-25x should result in highly attractive risk-adjusted returns even without any buybacks or other value-added moves that could commence if Nintendo takes on the mantle of Japan's newfound capital allocation hero. We don't need Nintendo to deliver spectacular hardware sales either, since (as the table on the next page shows) the implied annualized IRR of a scenario in which Switch unit volumes plateau at 15m per year still balances out in the 20% range over the next five years:

Valuation: Continuous Iteration Model (CIM):

(USD mn)	T5	T10
NOPAT	7,712bn	10,678bn
<u>Enterprise Value (\$B):</u>		
15x	\$115,676	\$161,518
20x	\$154,235	\$215,358
25x	\$192,794	\$269,197
Est. Future Cumulative Cash:	26,400	61,600
<u>ADR Equity Value Per Share:</u>		
15x	\$150	\$235
20x	\$190	\$292
25x	\$231	\$349
Current ADR Share Price:	\$58	
<u>IRR</u>		
15x	21%	15%
20x	27%	18%
25x	32%	20%

1.5mn Switches p.a.

T5	T10
7,236bn	11,628bn
\$116,152	\$161,994
\$154,869	\$232,569
\$193,587	\$269,990
18,480	43,120
\$142	\$216
\$183	\$273
\$224	\$330
\$58	
20%	14%
26%	17%
31%	19%

E. Nintendo's "slam dunks": Things we're highly confident will happen

A very high degree of predictability is one of the most important things we look for in an investment. So we find it very reassuring that two key areas of Nintendo's operations – Nintendo Switch Online and the shift to digital sales of software – are both "slam dunks" when it comes to their chances of success and their likely impact on the company's bottom line. Below, we consider each high-probability bet in turn.

1. Nintendo Switch Online

We expect NSO to be worth well in excess of Nintendo's current enterprise value by the end of our forecast period for the T5 scenario, given Nintendo's long history of demonstrated pricing power and all the untapped monetization levers at its disposal. After all, even after all its progress of the last few years, Nintendo still benefits from a large pricing umbrella provided by competing services from Sony and Microsoft. For example, users pay nearly \$200 a year to subscribe to Microsoft's Xbox Live and its Netflix-like Game Pass. As a result, the much higher priced online service established by its console peers leave Nintendo free to exploit its latent pricing power as it layers in new games and features with every single passing month and year.

Furthermore, even a quick glance at the Sony chart above should drive home the fact that videogame subscription services like NSO tend to generate very stable revenues,

given their inherent price inelasticity, the economically insensitive demand profile of online offerings, the intrinsically defensive nature of the industry, and videogames' superior "price-to-fun" ratio relative to other forms of entertainment media. Consequently, envisioning NSO's ultimate contribution to Nintendo's bottom line five years down the line hardly requires a crystal ball.

So how's NSO doing so far? As mentioned earlier on, paid subscriptions recently surpassed 32m, according to Nintendo's last disclosure in November of last year, more than quadrupling from 8m in late 2018. So not only did Nintendo crush our original estimate of 25.8m subs by the end of this calendar year, it beat that estimate a full year ahead of schedule – and by a significant margin, much as we suspected it would. Still, for several reasons, we believe the best is yet to come. Assuming ARPU of \$100 and an active subscriber base of 57m (as estimated in the CIM) by year-end 2027, we're looking at an incremental \$5.3bn in stable, virtually pure-profit recurring revenue at maturity – and over \$3.7bn in recurring after-tax earnings. **At a relatively modest 20x, those earnings would increase the fair value of Nintendo's equity by over \$74bn!** We don't count on this single revenue line to drive our investment thesis, but the reality is that NSO at maturity will almost certainly be worth considerably more than what the market is valuing Nintendo at today in its entirety.

Interestingly, one trusted source (who accurately predicted the details of the N64 Expansion Pass release over six months prior to its launch) mentioned to us that Nintendo has already completed its work on future NSO content-related releases concerning other "retro" Nintendo console games from the Gameboy, DS, GameCube, and Wii libraries. Various data miners have all but confirmed this, suggesting a veritable content explosion on the horizon. Such content libraries alone should be more than enough to get NSO's ARPU in line with our financial model above.

And one last point to keep in mind: One perk of owning the industry's most valuable treasure trove of videogame IP is that Nintendo has plenty of content to justify creating its own "All-Access Pass" – i.e. a subscription tier providing full access to Nintendo's vast library of emulated classics, in addition to its top "evergreen" Switch games, and DLC from its marquee game franchises. Such a tier could also grant subscribers early access to demos of brand-new Switch games, provide a guaranteed price discount on purchases of new titles upon release, along with the rest of the "bells and whistles" that already come with NSO membership.⁴⁹ Truth be told, we think Nintendo may have exactly this endgame in mind given its recent network

⁴⁹ Based on what Nintendo's peers have done, we suspect new games would be added to the service a year or so after they are released to avoid cannibalizing new game sales.

investments and its decision to kickstart the creation of more visual content like movies and TV shows, not to mention its existing content assets, most of which were expensed years, if not decades, ago.

Should Nintendo end up adding future shows and movies to its already staggering library of timeless games – and perhaps even streaming access to its one-of-a-kind music library and world-famous symphony’s – we believe it could charge subscribers \$19.99 per month easily, or approximately \$240 a year. Not only would the value proposition (defined as the “price to fun” ratio) provided to users in an “All-Access Pass” scenario absolutely dwarf what’s on offer from competing services like Disney+ in today’s “attention economy,” but the absolute level of overall engagement with what we’ll call “Endgame NSO” would skyrocket. That much seems certain.

Especially now, considering how that assessment aligns with the Game Pass stats that Microsoft released last week at GDC ’22.⁵⁰ Microsoft’s experience so far likely caused heads in Nintendo’s executive suite to snap back with a vengeance upon hearing the news. If that sounds like an exaggeration, “read ‘em and weep” – the stats speak for themselves: Subscribers play 40% more games after joining, with the average game available on Game Pass realizing an increase in total players of 8.3x! Game Pass members, on average, also try 30% more games across genres and spend 50% more than they spent before. We’ll just leave it at that.

In any case, if we run the same math above, we’re looking at \$12.5bn in virtually pure-margin recurring revenue and over \$8.7bn in after-tax earnings. At 20x, the implied uplift to Nintendo’s equity value would be \$175bn – a number that makes us want to lay down and take some deep breaths, considering that’s roughly 4.5x what Nintendo’s enterprise is valued at today in its entirety. If this relatively high-probability outcome was to come to fruition, not only would it reinforce our larger point, but the return to Nintendo’s shareholders from NSO alone would be more than enough to hit our 15 to 20% annualized hurdle rate over the next decade. Once again, we find ourselves a bit weak in the knees.

2. Software mix shift

Perhaps the biggest difference between our Base Case and the CIM is the CIM’s higher steady-state margin profile, due to its modeling a greater proportion of digital software sales. Framed another way, the CIM model assumes digital distribution is an unstoppable trend that will become the key driver of Nintendo’s earnings by the end of our forecast period. Below, we outline why we think that’s a reasonable assumption and look at the swoon-inducing implications for Nintendo’s results.

⁵⁰ GDC is the preeminent annual conference for game developers.

Recall that digital distribution of Nintendo's game software doesn't just boast higher margins than distribution on physical media (because Nintendo gets to cut out its retail middlemen, inventory shipping costs, and so on). It also turns what was once a one-off sale of a videogame into a margin-boosting stream of stable, recurring, essentially pure-profit revenue as players buy additional downloadable content ("DLC") and in-game add-on content like special items, levels, and features. In short, DLC and various forms of in-game monetization keep a game interesting for players – and lucrative for Nintendo – long after the initial sale.

Keep in mind as well that DLC (along with "season passes" and other online subscription packages) already represents a major chunk of revenue for Nintendo's rivals, with Sony and Microsoft's online services seeing decent uptake in markets around the world. Thankfully, the last few years have seen Nintendo cut itself a piece of that highly lucrative pie. It's rolled out season passes and DLC for its core titles in an ongoing bid to improve monetization of its marquee franchises while keeping users engaged. It's even launched subscription packages for several of its top mobile games.

But the story doesn't end there. Digital distribution is also a key element of the "Apple Model", as it incentivizes third-party developers to embrace a particular platform. Developers love selling their software in online marketplaces like Nintendo's eShop (its version of Apple's App Store) for at least three reasons: First, because of the indefinitely-lived nature of the Switch platform, the eShop makes it easy for developers to reach an ever-growing pool of users. And second, even after accounting for the eShop's 30% take rate, digital distribution's higher margins mean developers make more money off each unit sold than they would via physical distribution. Finally, Nintendo's transition to digital also makes it possible for game developers to offer lucrative DLC and live service subscriptions in addition to one-off online software sales.

The bottom line is that digital distribution is a true win-win: Developers like it for its higher profit margins and easy access to users, while consumers like not having to drive to a brick-and-mortar retailer or wait for a game to be delivered by mail. But the biggest winner, of course, will be Nintendo, as its profit margin on software sales heads permanently skyward. The truth is that digital distribution solves age-old problems simultaneously and for everyone involved, making Nintendo, third-party game developers, and consumers all unequivocally better off.

Moreover, trends toward digital distribution are as strong as they've ever been. Sales data suggest that we're approaching the beginning of the end when it comes to

videogames sold on physical media, and the decline is accelerating.⁵¹ In fact, we'd be willing to bet that you've all heard this story before:⁵² When was the last time you bought an actual, physical CD of your favorite band, or a DVD of your favorite movie? When was the last time you bought a computer that came with an optical disc drive?

For the above reasons and more, we view the secular megatrend toward digital distribution as virtually unstoppable – and likely to drive a step change increase in profits at Nintendo regardless of the direction of interest rates or whether GDP is up or down. And it's exactly the type of hard, internal catalyst that makes Nintendo an ideal investment in volatile markets like the one we're in now.

Unfortunately, we can't predict exactly how long the shift to digital will take, but if we had to guess, we'd say that it'll take less than five years for Nintendo to see over 80% of its total software unit sales taking place via digital download. In the end, the forces at work simply make too much sense to be thwarted, a statement that would still be true even if this trend didn't hit exit velocity years ago.

How will all this digital download stuff affect Nintendo's P&L? Here's how the numbers work: Nintendo sells Switch games for about \$60 each. With physical media, games are copied onto a memory card and distributed to brick-and-mortar retailers like Best Buy or online retailers like Amazon. The retailer, acting as a middleman, pockets roughly 30%, or \$18, of the retail price as its revenue. Nintendo's production costs (e.g. copying the games onto memory cards, packaging them in little plastic cases, and shipping them to retailers around the world) eats up another 8%, or about \$5. That leaves \$37 for Nintendo, who must then share it with any third-party developers that helped create the game. Once those costs are accounted for, Nintendo is left with approximately \$30, in line with the 3,657 yen used in our CIM for our average selling price figure for the last year.

Now let's compare those figures to the economics of digital software sales. Nintendo not only gets the full retail price for games bought via digital download, but it cuts out the retailer middleman entirely. Moreover, its production and distribution costs drop to zero. Consequently, Nintendo captures an extra 38%, or \$23, of the full retail price for each game sold. (Consumers win too, because they get to play the new game right away instead of driving out to a store to buy it or ordering it online and waiting for the delivery van.) Add it all up and Nintendo's average unit revenue for first-party

⁵¹ See Orland, Kyle, *Physical console games are quickly becoming a relatively niche market*, ArsTechnica, <https://arstechnica.com/gaming/2022/02/fewer-and-fewer-console-games-are-seeing-a-physical-release/>

⁵² For example, longtime Crossroads followers may have encountered it in our 2019 annual letter report on Nintendo, from which much of this section has been adapted.

games increases nearly 75%, from \$30 to \$53, also in line with the 5,750 yen average price per game figure used in our CIM.

That's already impressive, but let's look at the impact on total software sales. In fiscal 2022, Nintendo has guided for total software sales of 220m units. What if 85% of those units were sold via digital download?⁵³ That would mean 187m games sold digitally out of 220m. If we assume the first- vs. third-party split of downloadable packaged software is in line with management's recent commentary (i.e. roughly 45% first-party and 55% third-party), it follows that Nintendo would sell 84m first-party games digitally in fiscal 2022. Assuming Nintendo captures the entire \$23 in savings on each unit sold, that comes to \$1.9bn in pretax profit from first-party game sales alone.

And things start to get downright silly when we account for the other 103m in digital game sales from third-party publishers. After all, Nintendo charges an estimated 30% take rate on all sales of third-party Switch platform games sold via its eShop. And this revenue stream, by its very nature, is essentially 100% pure margin. So assuming the average third-party game is priced at \$50 (reasonable, given that these are major releases of downloadable packaged software, not download-only "indie" titles), we're looking at \$5.2bn in gross revenue, or approximately \$1.5bn in pretax profit.

Bringing it all together, the transition to digital downloads of game software would be worth a truly incredible \$3.4bn in pretax profit to Nintendo on fiscal 2022's estimated game sales. Tax it at 30% and that gets us to \$2.4bn, or approximately 273bn yen in net earnings. Capitalize that boost at 20x, and the implied uplift in Nintendo's equity value is roughly \$48bn! In other words, **the transition to digital distribution still to come is worth as much or more than what we are paying for Nintendo's entire business today**, despite the incredibly conservative valuation walk just outlined.

Bear in mind that when we say "incredibly conservative", we mean it. After all, the number of software units sold in a normal year five years down the road should be dramatically higher than what it is today, simply because the Switch platform's active user base will almost certainly be considerably larger. In other words, the true uplift to Nintendo's equity value should actually be much higher than the \$48bn figure above. But even if Nintendo doesn't embrace digitization as quickly as we predict, we wouldn't be overly concerned. We know where the digital distribution train is heading, and for that reason we aren't concerned about exactly how long it takes to get there.

⁵³ After all, 85% is roughly the proportion of digital in Sony's software sales mix. And software-only companies like Take-Two Interactive, Electronic Arts, and Ubisoft generate 87%, 89%, and 78%, respectively, of their total software sales digitally. When it comes to PC games, the delta is even larger, with digital currently representing over 90% of the industry's total revenues. Note as well that these are the figures today, not five years down the road.

Get there it will – and much sooner than investors are currently giving Nintendo credit for, as its present valuation makes abundantly clear.

In conclusion, Nintendo has mostly replaced the highly cyclical, hard-to-predict, lower-margin sales of its past with the predictable, increasingly high-margin, recurring sales of its future. That change makes the company worthy of a much higher multiple, which we think it will receive as investors gradually recognize that it's no longer the cyclical console maker they used to know, but a vertically integrated, noncyclical software and content creator characterized by recurring hardware upgrades and a perpetual, software-driven digital marketplace.

Thus, with modest and even draconian assumptions for operational/valuation variables, we see a highly attractive return distribution with annualized IRRs above 20% and a margin of safety wide enough to span the entire kingdom of Hyrule. Add in the presence of several hard catalysts that give us an idea of not only what specifically should make the stock “work,” but when, and the setup before us today is truly remarkable across the board.

V: POOR EXECUTION: NINTENDO'S MAIN RISK

Of course, any investment thesis faces risks. We don't feel we'd add much value to this report by rattling off a list of generic risks that could affect any company. Instead, we'd like to address one that has affected Nintendo in particular in the past – and we'd also like to explain why we don't think it will be much of a hindrance going forward. That risk is Nintendo's subpar execution in particular areas of its videogame business. Specifically, we're referring to (1) NSO, (2) mobile (smartphone-based) games, and (3) perpetual “virtual world” live service games.

A. Problems with NSO, mobile, and virtual worlds

While we continue to believe that NSO will be a massive earnings growth engine for Nintendo, in its early days it suffered from an inadequate amount of content and an inconsistent schedule for releasing new content. Not only was there a lack of new and exclusive multi-player titles available (think Pacman99), but also, and even harder to explain, there was a lack of consistent new releases from Nintendo's classic games library. Thankfully, this problem has been rectified, but we still feel that management left plenty of opportunity on the table back then by failing to provide plenty of value for the money to early adopters. On the other hand, NSO was established as a low-cost beachhead at a price point roughly one-third that of its competition. Perhaps that explains Nintendo's lack of focused effort earlier on. Or maybe the company was always more focused on what was to come. Either way, we've been deeply pleased to

see Nintendo dramatically upping its game. The difference between NSO then and NSO now is truly night and day.

Next, perhaps Nintendo's biggest miss in recent years has been the poor performance of its mobile (i.e. smartphone-based) games. Its anemic results in this area flowed in part from an arguably admirable reluctance to adopt proven, but aggressive, monetization tactics in which players spend money for the mere *chance* to receive a desired special item or feature, often getting something worthless or undesirable instead. (This mechanism is called *gacha* in Japan, after the noise made by vending machines that dispense a random toy when you put in your money and turn a crank.) However, while we've come to agree with management's principled stance on *gacha*, we don't think that's where it dropped the ball. The real problems were that it (1) failed to release enough new titles, and (2) saddled the ones it did release with subpar functionality.

For example, Nintendo released *Mario Kart Tour* (MKT), a mobile entry in its classic, beloved *Mario Kart* series, back in 2019 – but without a multiplayer option. This was virtually a kiss of death for a game in which half of the fun lies in racing against other players. Even more frustrating, MKT is enormously fun in its current form and probably would have been a blockbuster hit on the level of Pokémon Go, if only Nintendo had held back on releasing it until the multiplayer feature was ready.⁵⁴ In short, Nintendo's treatment of MKT remains a glaring misstep, and the paucity of titles released since has led some observers to question whether Nintendo really wants to develop mobile games at all.

Finally, Nintendo missed a golden opportunity to exploit the blockbuster success of *Animal Crossing* by converting that title into a perpetual, premium live service. Perhaps the jury is still out here, given what Nintendo has done in the interim with *Mario Kart 8 Deluxe* (we remain optimistic), but, at best, this is another painful example of opportunity lost. Which gets at another, related issue that we will continue to keep an eye on: Nintendo dragging its feet by failing to develop its own in house “live service” game expertise. Granted, by all accounts Nintendo appears to have gotten religion when it comes to embracing the industry's larger transition to the server-side, including renewed efforts with respect to perpetual live service games, but the fact remains it could have been several years ahead of where it stands today.

⁵⁴ This outcome contradicts Nintendo legend Shigeru Miyamoto's famous dictum that “[a] delayed game is eventually good, but a rushed game is forever bad.” It's an example of a rushed game eventually becoming good!

B. Fixing the problems

As we'll explain below, we don't see any of the above problems impacting our investment thesis.

1. *Catching up in online services*

First, Nintendo is rapidly catching up in online game network infrastructure and gameplay. It's also improving the user interface of its eShop and the Switch OS to make it easier for users to find new games, or better organize games in the latter example, amongst other long overdue improvements to better compete in the present environment. As management announced last November, it's investing billions of dollars into leveling up its online-related gameplay capabilities, developing new software assets, and expanding the frameworks of its in-house game development expertise.

Interestingly, our industry contacts claim that most of the heavy lifting is already done in terms of improving connectivity. Indeed, one contact noted that Nintendo's online overhaul is already complete and its server structure for system services is fully up to date. Specifically, Nintendo has already fully replaced its 18-year-old NEX multiplayer server system with a brand-new, state-of-the-art system called NLPN, which it developed entirely in-house. The fruits of this move began to appear with the release of *Monster Hunter Rise* last year, but it stands to greatly improve online gameplay for all future Switch games. (According to this same source, and reported elsewhere, NPLN is hosted on Google Cloud servers, with significant speed improvements while running in multiple regions). Another contact mentioned that now that Nintendo has made the full transition to its new system, it will likely improve the performance of existing games through patches and updates that take advantage of NPLN – much like Nintendo has already done with the emulated classics it released as part of NSO's new N64 expansion pack.

On NSO content, it's clear Nintendo has finally tightened things up at the online service after a so-so start. Its decision to begin bundling DLC of its marquee franchises that have the largest and most engaged player bases is an absolute game-changer – not only with respect to its attach rate, but also regarding the ARPU of its subscription base. And as just mentioned, it's already gone back and fixed early issues with its higher-priced subscription tier, the N64 Expansion Pack. Perhaps best of all, the frequency and quality of new content releases has dramatically improved: NSO subscribers today are receiving substantial and increasing value for their money – i.e., the online service equivalent of a value unlocking skeleton key.

2. Sidestepping smartphones

We can't point to similar improvements on the mobile front outside of Nintendo's efforts to radically improve its online multiplayer capabilities noted above, with the lone exception that the quality of the existing games continues to markedly improve (likely a function of the transition to mobile GaaS briefly touched on earlier on in this update). But that's okay, because mobile isn't (and never has been) a key element of our investment thesis. While we remain optimistic on mobile's long-term prospects, further progress within this segment of Nintendo's operations will ultimately be icing on the cake. And besides, if our giant, delicious Nintendo cake ends up with a bit less icing than we had hoped for, that's fine too.

One might even take Nintendo's apparent lack of enthusiasm for mobile as a sign that it would rather focus on making its core videogame business the best it can be. Indeed, by refocusing its mobile efforts on long-lifecycle, live service console games via DLC and NSO exclusives, the long-term outcome should be much the same. And candidly, that's probably the right call. It plays to Nintendo's strengths in creating highly differentiated videogame content with best-in-class gameplay and dedicated controls, while avoiding the ethics and quality issues that have stymied Nintendo's smartphone efforts to date. Even if it's just continuous DLC that spans the gap between new entries in Nintendo's marquee franchises, the optionality embedded in this type of pivot is truly massive. For example, perhaps it's not an accident that a significant chunk of the new racetracks available in *Mario Kart 8 Deluxe's* expansion pack were upgraded versions of tracks pulled from its smartphone based, *Mario Kart Tour*.

And besides, the industry is already moving in the direction of transforming its biggest franchises in the console gaming toward a GaaS-like model that has its roots in free-to-play smartphone-based games. A recent *Washington Post* article⁵⁵ explains the trend quite well, saying, "Some of today's most popular titles, like *Fortnite* and *Genshin Impact*, are free to play and offer an endless stream of content to collect, buy or explore. These aren't the games found inside a 1980s arcade. They *are* the arcades; virtual worlds for hanging out with friends." To be clear, there are plenty of things in that article we disagree with, but it does a good job of highlighting some larger trends that Nintendo is perfectly positioned to exploit on both ends.⁵⁶

⁵⁵ <https://www.washingtonpost.com/video-games/2022/03/18/game-length-open-world/>

⁵⁶ There are a variety of countercyclical offsets to Nintendo's "virtual world" blockbuster franchises like *Animal Crossing*, *The Legend of Zelda*, and (increasingly) *Pokémon*, such as the Switch platform's dominance in shorter-form indie games and the wide-ranging tastes of Nintendo's diverse user base.

3. Embracing the cloud/live service games

Also, as we suggested above, Nintendo management finally seems to have embraced the cloud and a larger transition to server-side, live service games. While Nintendo can be frustratingly opaque in its disclosures, its recent \$900m investment in expanding its internal game development frameworks strongly suggests that it's finally serious about developing the cultural and operational know-how needed to both create and operate perpetual live service console games. And in a way that is worthy of the Nintendo name, i.e., games that exhibit sustained high levels of user engagement. A pivot toward more live service console games would have us bursting at the seams with excitement, as it threads the needle in every way that has frustrated Nintendo's efforts in the smartphone space (as mentioned earlier in this update).

And last but not least, we'd be remiss not to mention another risk related to the larger trend of increasingly commoditized hardware and the rise of cloud gaming: On the off chance cloud gaming makes actual consoles obsolete, Nintendo wouldn't be hurt, it would thrive. Its games would be released from their TAM-limiting chains, multiplying their addressable market severalfold.

As we mentioned in our 2019 annual letter, the sooner Nintendo embraces the cloud, the better. After all, in videogames and elsewhere in today's "attention economy", content is king. And Nintendo is the greatest content creator the videogame industry has ever seen. More than that, its game creation capabilities are the best they've ever been. Indeed, even a quick perusal of the ratings of Nintendo's Switch era games illustrates that Nintendo is absolutely on fire in a way that has no historical analogue. With few exceptions, nearly every first-party title released on the Switch thus far is a genuine masterpiece.

In short, an industry-wide shift to gaming in the cloud that renders consoles unnecessary would likely cause Nintendo's share price to triple overnight, and for good reason. In any case, as with all predictions, we'll see.

C. Nintendo's absolute commitment to quality

We've talked above about how Nintendo is beefing up its online services and embracing a larger console-based approach toward GaaS. But doesn't success at all of this still depend on Nintendo being able to produce hit games? Isn't Nintendo ultimately still saddled with a risky, hit-driven business model – if not in hardware, then in software?

The answer is no. Over several decades, Nintendo has proven that it can produce blockbuster games reliably and consistently. Games that continue to sell millions of copies a year, and long after their initial release - providing Nintendo with an

“evergreen” source of recurring revenue.⁵⁷ But to say this is a function of Nintendo’s stellar core IP is only half true. If you want to know how Nintendo does it (or Apple for that matter), we will humbly suggest that you have to dig below the numbers to a deeper reality. In this case, that means looking beyond the financial statements, not just to gain a better understanding of the company’s psychology, but to understand its true character and hence, its love of delighting and surprising its users in that uniquely special Nintendo way – Nintendo’s true *raison d’être*.

Allen Mecham once made a similar point, noting that analysts tend to overweight what can be measured in numerical form, even when the key variable(s) that will ultimately determine the outcome cannot easily be expressed in neat, crisp numbers. We bring it up only because when it comes to gaining a deeper understanding of the opportunity before us in Nintendo’s equity, focusing on its statistical cheapness and other quantitative metrics misses arguably the most important part of its larger story.

So how does Nintendo so reliably produce blockbuster hits, year in and year out? Well, for our money we’re not sure we’ve ever heard a better explanation of what makes Nintendo truly unique than the one below, from a commenter on a Horace Dediu article on Asymco.⁵⁸ It’s one of the better explanations of Miyamoto’s famous dictum (mentioned in footnote 56) that “[a] delayed game is eventually good, but a rushed game is forever bad”⁵⁹, and a near-perfect description of what makes Nintendo great:

Blockbusters can be built repeatedly. It is no mystery. The key is don't ship any non-Blockbusters. You must have a lot of ideas and iterate and iterate until you have a great product, whether that takes 6 months or 6 years. You must prototype immediately so you can see what you have and see its flaws, then iterate and iterate, constantly improving the prototype. It's like a painter who sketches with newsprint and conté every day, then takes only the best sketch and does variations and drawings until he has something epic and only then does he go to the easel and do a paint and canvas version. And then, if the painting doesn't sing, he shelves it or iterates again. He only ships the Blockbusters, the ones that make him weep. Then people will say every painting is so deep, so full of ideas, so complete in its vision, how does he do it again and again? Always high quality, always making you weep! Well, you didn't see all the failures. They died on the

⁵⁷ For example, through the first three quarters of FY 2022, over 60% of Nintendo’s sales of first-party game software was of “evergreen” titles purchased in past years.

⁵⁸ <http://www.asymco.com/2011/04/29/when-exceptional-growth-is-not-an-exception/#comment-299981101>

⁵⁹ According to videogame researcher Ethan Johnson, Miyamoto’s famous quote may actually be a misattribution: https://twitter.com/GameResearch_E/status/1504663521539375104?s=20&t=D3F8n3ci8BF92Pih4oWEVg However, there is no doubt Nintendo shares its sentiment, preferring to take as much time as necessary to perfect a game instead of pushing a flawed version out the door to meet an arbitrary release date.

sketchbook or on shelved canvases. But they were failed experiments, they contributed to the successes by answering questions, and developing the artist's technique.

Both Apple and Pixar don't even start production until they have a Blockbuster prototype. They must be that way because their production costs are so high. Millions of iPads, or millions of frames of computer graphics are much more expensive to throw out than hundreds more prototypes. That's just not acknowledged by most makers. They say, we have to ship by March or we miss our opportunity, and they do one sketch, one production, and ship. Maybe it is good, maybe not.

It's not divine inspiration that makes a good product, it's just hard work and high standards.

Nintendo repeatedly succeeds in business because, when it comes to producing games, it doesn't act very businesslike. It behaves more like a Japanese master artisan than a company churning out product. In fact, we believe the deep devotion of Nintendo's craftspeople to videogame design lies at the very heart of the company's enduring relevance.

That brings us to another point we want to quickly hammer home: Nintendo's artisans and the company's singular devotion to its craft explain why Nintendo operates in such a slow and methodical way. It's why it often delays game releases, avoids jumping into smartphone games with both feet, and makes other growth-restricting decisions that most on Wall Street seem to genuinely hate. But to Nintendo longs like us, stuff like that is quite literally what makes Nintendo what it is today. It reflects not only Nintendo's ideals and its relentless pursuit of perfection more generally, but the deeper reality behind its character. And in the long run, the character of a company is everything.

For example, on a certain level we've been disappointed by Nintendo's poor execution – some would say lack of execution – on smartphone games. However, we've come to believe that Nintendo's decision to largely steer clear of the aggressive monetization tactics and severely limited gameplay that define the mobile space was actually in the company's best long-term interests.

How so? Well, it's not a popular take, but the reality is that many mobile games – too many, in our opinion – have relied on lottery-like *gacha* monetization schemes, which opened game makers up to charges of promoting gambling addiction and overspending among their most psychologically vulnerable users.

Maybe it's just us, but complaining about Nintendo's reticence to embrace the Vegas-style monetization tactics of slot machines is odd to say the least. And expressing indignant disbelief and outrage (as some of the more visible analysts on Wall Street have done) over Nintendo's concern that monetizing mobile in this way risked betraying the reservoir of trust the company has built up over decades with its customer base, has always struck us as strange. Nintendo is a globally beloved, family-friendly brand whose most popular games and characters are based on highly stylized cartoons, for Pete's sake. All of which is to say that, from our perspective, the risks to Nintendo's brand from adopting the industry's aggressive, ethically questionable practices were (and remain) both considerable and routinely downplayed.⁶⁰

To be clear, we still think Nintendo could chart its own unique course on smartphone games. For example, embracing GaaS instead of *gacha* as its core monetization method was a great start. And a pivot toward "exercise GaaS" would be positively inspired. But we didn't bring this controversy up because we wanted to rehash the strategic merits of Nintendo's experiments in mobile gaming. Rather, we mention it because of what the controversy tells us about the other key takeaway we want to put before you today: Management teams with the wisdom and character to walk away from the temptations of "easy money" (which in this case, it could effortlessly rake in by harpooning "whales" each and every day) are as important as they are rare.

Famed investor Nick Sleep hit the nail on the head when he said, "We have learned or, rather, come to appreciate, that the character of a firm – call it the ability to resist locker room temptation – is far more important than we first realized. This is an important insight. In the long run it may be all that matters."

That certainly rings true with us. We've seen a lot over the last 20 years, and one fact pattern consistently repeats: Good things take time. Indeed, whether we're talking videogame design or winning the Stanley Cup, thinking long-term and making steady progress with every passing day are what generate real results. Indeed, all of us could do worse than turn to Nintendo for a better understanding of what true commitment to doing what you do best actually looks like at the end of the day.

In sum, the unique mission-led culture at Nintendo comes from a place where creativity and tradition are inextricably linked, and that's a good thing! It's Nintendo's offbeat culture, incredibly high standards, and passionate devotion to its craft that has kept customers coming back, again and again, over a period spanning decades. It's also what makes the company so durable – one of the few capable of enduring

⁶⁰ In fact, as we noted above, many publishers of top console games today are using GaaS to generate high revenues while avoiding the ethical quandaries and poor gameplay of many smartphone games. Perhaps Nintendo's long drought in mobile releases has really been the result of management resetting the deck toward adopting a GaaS strategy for console-based live service games? Our fingers are crossed!

through time with its character intact and its head still screwed on straight. Naturally, should anything ever change in this regard, we'll sell our shares and walk away. Thankfully, for better and for worse, Nintendo will almost certainly continue being itself regardless of what people say. That's something that probably can't be said about any other company in today's videogame space. It applies only to the big N. And you can take that to the bank.

D. Macro issues

We don't want to dwell on generic macroeconomic risks facing Nintendo. However, given the market's current concerns about rising interest rates and inflation, we'll note that we find it hard to imagine a business better positioned than Nintendo to weather any resulting storm. Given its Fort Knox balance sheet, its dirt cheap multiple (both in the absolute sense and relative to peers), its substantial *untapped* pricing power, and an ongoing business model transition that should continue to deliver transformational value-unlocking change, Nintendo's equity should do extraordinarily well regardless of whether money remains cheap or sustained inflation kicks in.

After all, the continued digital shift of Nintendo's sales should allow it to maintain its revenue and margin trajectory pretty much regardless of macro factors. In other words, the continued normalization of Nintendo's software mix toward a level more in line with its console and game developer (i.e. software-only) peers, alongside the maturation of NSO, should all but ensure that the endgame for shareholders remains the same.

So if you're looking for a fundamentally great, recession-resistant business with a widening moat and a ludicrously low multiple; that should do well in high- and low-interest rate environments; and that should continue to grow its sales and margins even amidst a general decline in consumer spending (and a number of other scary economic things), then Nintendo is for you.

Absent management losing its collective mind and abandoning the Apple Model, its slow and steady pivot toward GaaS, and its shift to online, digital sales, the short-, medium-, and long-term signs at Nintendo all point to a stock price multiples higher than where it stands today.

VI. CONCLUSION

Since publishing our original Nintendo thesis, we've seen the business progress as expected, with new initiatives debuting that only compound the advantages already established in the earlier innings of the company's ongoing transformation. Despite that, we've seen Mr. Market essentially go off the deep end, once again by tilting at "peak Switch" windmills, in effect creating yet another phenomenal investment

opportunity that is even more mouthwatering than the setup when our journey with Nintendo first began. In fact, true to the adage “actions over words,” with such a large decline from the highs despite great core fundamentals and an avalanche of positive new flow, we’ve increased our stake.

In this letter, we’ve tried to debunk some of the most common bear arguments against Nintendo – because we expect they’ll soon be blown away for good by a successful transition to the technologically advanced Switch Pro, Nintendo’s most significant new version of the Switch since the original. After all, the most successful investors recognize opportunity well before the crowd catches on. Or to use one of my favorite (and admittedly overused) hockey analogies, great investors need to skate not to where the puck is, but to where it’s going to be. We hope we’ve given you a good sense of where we think Nintendo will be, and why we’ve skated there.

At the same time, we know that good investors maintain enough humility and skepticism to accept that they could ultimately be proven wrong. All of us here at Crossroads question our assumptions about our portfolio companies every single day. In fact, that’s one of the many reasons why we’ve refreshed and clarified our thinking on the mechanisms of the Apple Model analogy and the economic power Nintendo’s ecosystem generates: If we’re wrong, we want to know it. Rest assured that should the collective evidence that appears, to me at least, to possess a singular unity, ultimately prove to be no more than a retrospective illusion, I’ll admit it, sell our shares, and move on. Fortunately, Nintendo continues to trade at a valuation that should allow us to win either way.

So join us dear friends in taking one more bite of the ol’ Apple as Nintendo forges ahead and completes a quest it began all the way back in 2015. Please know we remain ever grateful for the trust and support – and time, for that matter. Reading long-form updates like this one requires a significant investment of time and attention on your part, and for that we are deeply appreciative and thankful. We hope you enjoy it.

I’d also like to personally thank everyone at Crossroads and a few trusted friends who were instrumental in helping me put this piece together, particularly my business partner Justin Weiss, Crossroads analyst Harshal Devnani, and my gifted peers Daniel Prather, Alex Draime, and Toan Tran. Without their shrewd edits and constant feedback, the tome before you today would likely have been twice as long (ha!). In all seriousness, their efforts made this 2021 annual considerably better than it otherwise would have been, and for that I’m eternally grateful.

As for our performance in 2021, we ended the year up 6.1% after tax. Certainly, it was a more tempered performance than 2020’s, but that’s not too surprising given 2020’s outsized return and the strong headwinds from significant drawdowns in a few of our

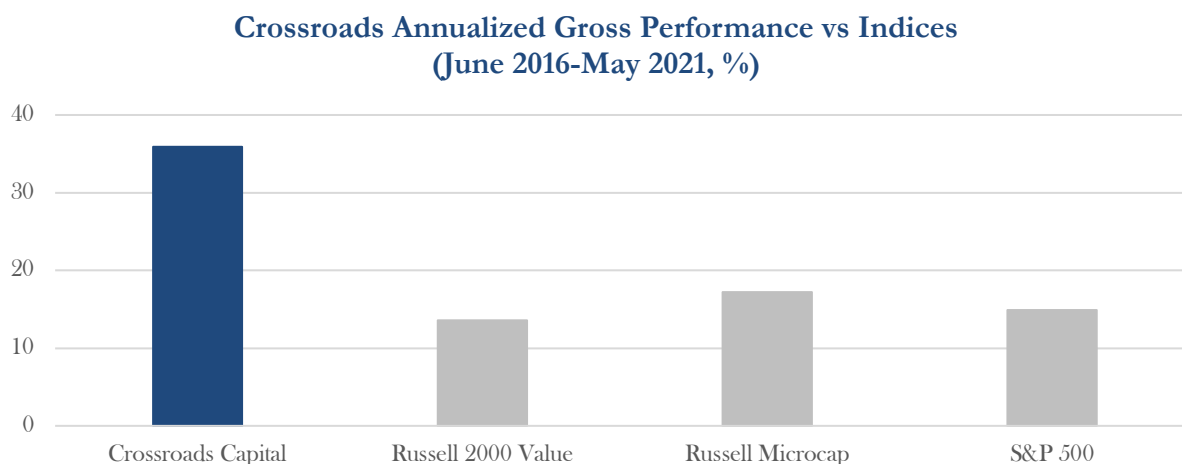
top positions. While not our finest hour, it's also the nature of the game – and thus not entirely unexpected as the broad market settled down and absorbed several profound realignments across the business world while the aftereffects of the global pandemic continued to dissipate.

We believe our outsized investment in Nintendo, and our book more generally, has us well positioned for a choppy 2022, as multi-year tailwinds in Fed policy flip to headwinds, and the hot air in frothier pockets of the market compresses multiples back toward healthier levels. Moreover, while we try not to comment on performance periods of less than three years, and generally don't discuss returns over periods of one year or less (for obvious reasons), the weakness across capital markets in early 2022 has been considerable. While Crossroads hasn't been immune, the good news is that the Fund has held up relatively well. In fact, the estimated forward IRR of our portfolio approximates levels reached in only two other periods since the Fund began: the fourth quarter of 2018 and March 2020.

Of course these estimates are prone to all the ordinary pitfalls of predictions, but we believe now is a good time for partners looking to add to their positions in the Fund to do so. Candidly, the bargains available today are remarkable in both quality and quantity, and we've drawn down our generally heavy cash balances to reflect this fact.

Finally, we marked our five-year anniversary last June, providing the partnership with our first genuine long-term performance period since I opened Crossroads' doors all the way back in the summer of 2016. How'd we do? Not bad, it turns out.

Crossroads' five-year CAGR came in at 35.9%, outperforming the broad market and our benchmarks by 21.0%, 18.7%, and 22.3% respectively:



Crossroads Gross and Net Performance vs. Indices (June 2016-May 2021, %)

	3-Year (Annualized)	Since Inception (Annualized)	Since Inception (Cumulative)	Gross Relative Outperformance (Annualized)
Crossroads (Gross)	43.8	35.9	363.7	-
Crossroads (Net)	35.6	28.7	252.2	-
Russell 2000 Value	10.6	13.6	89.0	22.3
Russell Microcap	14.0	17.2	121.2	18.7
S&P 500	15.8	14.9	100.3	21.0

We were pleased to see our use of portfolio structuring as a defensive tool protect our precious capital in downturns, both over time and during the worst peak-to-trough period for the broad indices since inception. The Fund has not only outperformed the broad indices in terms of average monthly return, it also lost less in down months, which we're particularly proud of. We had one down year, 2018, which we more than made up for in 2019 and 2020, a testament to our ability to weather uncertain times:

Crossroads Monthly Net Performance (June 2016-May 2021, %)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
2021	7.95	5.99	(3.41)	6.13	(1.63)	-	-	-	-	-	-	-	15.38
2020	(0.80)	(7.21)	(5.16)	17.51	12.14	5.39	6.00	12.45	5.13	2.42	8.00	10.24	85.46
2019	11.29	1.02	0.58	4.47	1.98	1.96	0.26	(2.34)	0.89	4.86	0.85	5.14	32.53
2018	1.56	(4.56)	5.93	(1.25)	1.04	0.29	0.68	5.52	(1.90)	(7.44)	(4.86)	(4.47)	(9.91)
2017	2.90	1.89	2.58	3.57	(4.80)	2.93	3.26	(3.29)	6.12	(1.61)	(0.06)	5.18	19.61
2016	-	-	-	-	-	(0.12)	0.75	3.94	(0.87)	3.15	2.95	4.68	15.26

A track record like that is good enough for us to avoid hanging up our cleats, but we'll keep our heads down and get back to work on making our next five years even better. Please know that we remain firm in our belief that Crossroads' best days lie ahead, and we couldn't imagine a better group of partners to share them with. None of what we've accomplished to date would have been possible without your continued trust and faith.

Sincerely,



Ryan O'Connor

APPENDICES

APPENDIX 1: EVIDENCE THE SWITCH PRO IS COMING

Nintendo hasn't officially announced the Switch Pro, so how can we be so sure it's on the way? Aside from leaks, rumors, and other pieces of industry scuttlebutt, we have several reasons for believing it's not only coming, but coming this year.

A. Massive investment in online infrastructure

Nintendo recently announced plans to spend almost \$4bn (above and beyond normal capex) not only fixing its technical shortcomings in online infrastructure, but expanding its internal development frameworks to better learn (both culturally and organizationally) how to operate its own live service games. That massive investment simply wouldn't be necessary unless the Switch were getting a substantial upgrade. It would be even more incomprehensible if the Switch family of devices were merely a few years from retirement, as Nintendo's current valuation seems to suggest.

B. Bloomberg article

Perhaps the most convincing evidence is a September 2021 Bloomberg article⁶¹ claiming that 11 companies have had access to Switch Pro development kits as early as late 2020, even going so far as to explicitly name Zynga as one of the eleven.

Our view is this article was clearly intended to support Bloomberg's previous claims that a Switch Pro is in the works. Bloomberg understandably wanted to make clear that its reporters hadn't been misled by rumors or mistaken the then yet-to-be-released OLED-screen Switch for a supposedly more impressive Pro model with the ability to upscale graphics to 4K. Considering Nintendo's very public denials concerning Bloomberg's past reporting, it's hard to see how Bloomberg could afford to let the risk slide. Its reputation for journalistic integrity was at stake.⁶²

Nintendo responded by calling Bloomberg's reporting "inaccurate." It pretty much had to, since confirming the Pro at that point would almost certainly have torpedoed sales of the recently released OLED model, as users intending to upgrade would opt to wait for the Pro instead – a phenomenon known as the Osborne Effect. However, by issuing only a vague, blanket accusation of inaccuracy and refusing to specify what

⁶¹ <https://www.bloomberg.com/news/articles/2021-09-29/nintendo-switch-4k-developers-make-games-for-nonexistent-console>

⁶² A friend of ours who reviewed a draft of this letter quipped that its reputation for journalistic integrity wasn't all that great to start with. However, we think our point stands.

exactly the article supposedly got wrong, Nintendo ironically lent credence to Bloomberg's claims.

Keep in mind that Nintendo frequently lies its ass off for exactly this reason. It's done so countless times. This is a company that denied the existence of a larger screen coming to the 3DS, only to turn around and release the 3DS XL less than a week later – seriously, we're not kidding.

But we're not hanging our hat on a single news article. We have several sources who independently confirm not only that the Pro is in development and possesses a much more efficient chipset (capable of using DLSS to achieve 4k), but that all current Switch games will be forward-compatible with it.

For now, let's just assume the Bloomberg article is correct, as it provides objective evidence that not only is the Pro for real, but also that (1) games have been in active development for it for some time, and (2) Nintendo had been planning to launch it sometime in 2021 prior to the pandemic-driven supply crunch throwing a giant wrench in those plans.

C. Next-generation “System on a Chip” (SoC)

So we know Switch dev kits are already out in the wild, with the ability to upscale games to 4K DLSS. And if such dev kits have already gone out, the internal components of the next Switch – i.e. the Pro – MUST have changed. Otherwise, why would Nintendo need to send out new dev kits in the first place? Not a single developer we've ever heard of received a new development kit for the Switch Lite or the OLED model. And for good reason: Development kits are only shipped when there has been a major change to a console's internal hardware. That's simply common sense.

The answer, then, is that the next Switch will have new hardware architecture – i.e. a new Nvidia “System on a Chip” (SoC). This view is corroborated by several sources⁶³ claiming that Nvidia discontinued production of Tegra chips (the current chipset for Switch family devices) earlier this year.

1. More evidence that a new Nvidia SoC is being developed for the Switch Pro

We're only scratching the surface of Nintendo's various tells. Below we offer four separate, additional signs that a new SoC is on the way:

⁶³ See, for example, <https://www.pcmag.com/news/report-Nvidia-to-end-production-of-nintendo-switch-tegra-chip>

a. Internal hiring:

The recent job opening pictured below highlights that Nintendo is looking for debugging professionals, implying that a Pro with a new SoC is just around the corner. After all, debugging is the final stage of development for a console and what would they need debugging interns for if not specifically for new hardware?



Of course, with this internship set for the summer of 2022, the job posting aligns beautifully with our expectation that the Pro will hit store shelves by the holiday quarter this year or early next.

b. Patent filings

How about the two DLSS patents⁶⁴ Nintendo filed in March 2021 that were released publicly in late September? (Of all the ways for investors to discover clues about a tech company's future plans, keeping tabs on patent filings is one of the best.)

⁶⁴ <https://www.freepatentsonline.com/y2021/0304356.html>



US 20210304356A1

(19) **United States**(12) **Patent Application Publication**
DELATTRE et al.(10) **Pub. No.: US 2021/0304356 A1**
(43) **Pub. Date: Sep. 30, 2021**(54) **SYSTEMS AND METHODS FOR MACHINE
LEARNED IMAGE CONVERSION**(52) **U.S. CL.**
CPC: ... **G06T 3/4046** (2013.01); **A63F 13/53**
(2014.09); **G06T 1/20** (2013.01)(71) Applicant: **NINTENDO CO., LTD.**, Kyoto (JP)(72) Inventors: **Alexandre DELATTRE**, Vioffray (FR);
Théo CHARVET, Paris (FR); **Raphaël
PONCET**, Paris (FR)(57) **ABSTRACT**(21) Appl. No.: **16/836,032**(22) Filed: **Mar. 25, 2020****Publication Classification**(51) **Int. Cl.**
G06T 3/40 (2006.01)
G06T 1/20 (2006.01)
A63F 13/53 (2006.01)

A computer system is provided for converting images through use of a trained neural network. A source image is divided into blocks and context data is added to each pixel block. The context blocks are split into channels and each channel from the same context block is added to the same activation matrix. The activation matrix is then executed against a trained neural network to produce a changed activation matrix. The changed activation matrix is then used to generate a converted image.

While the application is written in technical jargon, rest assured that “systems and methods for machine learned image conversion” describes the same process that underpins Nvidia’s Deep Learning Super Sampling (DLSS) technology, which works with some of its GPUs to upscale images in real time.⁶⁵

c. EA’s *Madden* & *Live Services*

A recent Digital Trends article⁶⁶ notes what most high-end gaming enthusiasts have long known: High-powered, online-intensive games like EA’s *Madden* and its first-person shooter *Battlefield* are not available on the Switch, since the system simply isn’t powerful enough to run them. It’s true that EA’s *FIFA Soccer* has made its way to the Switch, but the Switch version of its most recent entry in the series, *FIFA 22*, is actually just a dumbed-down version of *FIFA 2019*. The only real differences between the two are updated player ratings and team rosters. Again, this is a game released all the way back in 2018, supporting our contention that the current Switch family is simply not powerful enough to run faithful renditions of many current-gen third-party titles.

What does this have to do with proving that a Switch Pro is right around the corner? Well, consider the following 2020 EA job posting for an online software engineer position:

⁶⁵ For a real-life demonstration of DLSS’s effect on a console like the Switch, this YouTube video by Digital Foundry is outstanding: https://www.youtube.com/watch?v=_ja-31bYFTs

⁶⁶ <https://www.digitaltrends.com/gaming/what-is-ea-play/>

Online Software Engineer - (C++) - Madden

Location: Orlando, Florida, United States

Requisition Number: 162844

Date Opened: 2020-11-13

Online Software Engineer - C++ - Central Platform Team

We are EA Sports

EA SPORTS is one of the leading sports entertainment brands in the world, with top-selling videogame franchises, award-winning interactive technology, fan programs, and cross-platform digital experiences. EA SPORTS creates connected experiences that ignite the emotion of sports through industry-leading sports video games.

The Challenge Ahead:

The Online Engineer is involved in the whole creation process from architecture design, implementation, debugging, and tuning on multiple platforms and device, working on complex problems with Designers, Artists and other Engineers in the Online and Game Modes domain. You will report to the team's manager and work with your peers on developing the game's foundation layer.

What you will do as an Online Engineer:

- Develop technical solutions for online game features.
- Work with a proprietary engine to develop stable, scalable, efficient and shareable code.
- Work with people on a large team both locally and remotely.

We are looking for:

- 3+ years of experience in C++ software development.
- Experience with Client/Server, Peer-to-Peer and multi-threaded architectures.
- Knowledge of modern database technologies.
- Knowledge of networking protocols.
- Knowledge of good software programming practices.
- Experience with 3rd party APIs.

Nice to have:

- Bachelor's degree in computer science or related field, or equivalent training and professional experience.
- 2+ years of experience working on Microsoft, Sony or **Nintendo game consoles or other embedded systems**.
- Experience of real-time game networking.
- Experience with Visual Studio and deep knowledge of the debugging tools.
- Experience with source control systems will come in handy.
- Experience with scripting languages (Python, Lua) and interpreted languages. (C#)

The portion highlighted in gray makes this the first job posting we've ever seen where EA mentions Nintendo by name. (The last time EA made *Madden* available on a Nintendo system was all the way back in 2012.) Moreover, around the time of this job posting in late 2020, various EA insiders started to change their tune about porting over not just EA's more demanding marquee franchises (including its sports annuities like *Madden* and *FIFA*), but also its *EA Play* live services business.

For example, EA SVP Mike Blank briefly discussed EA's revised stance on releasing its products on the Switch platform, noting that EA had recently announced it will be bringing a variety of its leading games to the Switch. Far more interesting, though, was

Blank's emphasis regarding his hopes that EA will bring its online subscription service *EA Play* to the platform too. According to Blank, "[w]e foresee bringing more games to the Switch over time, and I think if there are opportunities for us to bring our subscription there and bring an even larger portfolio to the Switch, we will do so."

We highlight the latter comment because *EA Play* is so technologically demanding that it couldn't possibly run properly on current Switch family devices. Therefore, Blank's comment suggests a future in which the Switch platform is supported by much more powerful hardware and state of the art online infrastructure. The latter development came true, and we think this one will too. In any case, little pieces of evidence like these are numerous, and together they paint a clear picture of a powerful Switch Pro debuting soon.

One quick aside before we move on: As alluded to above, EA's desire to bring *EA Play* to the Switch implies a future that is even more exciting than a world with more powerful hardware. After all, if Nintendo is willing to let EA port its subscription service to the Switch platform, we will almost certainly see other subscription services follow suit. Services like Microsoft's Game Pass. While we had to cut the section for length, rest assured a development like that would have ground shaking implications for both engagement on Nintendo's platform and its earnings power longer-term. Regardless, we've talked a lot in the past about a potential Microsoft tie-up and we continue to think it's in the cards. Should it happen, Nintendo's true value will prove to be far higher than what the valuation analysis we've laid out in this update suggests.

d. Nvidia data breach

Shortly before we were set to release this update, a bombshell story hit: Nintendo partner Nvidia had the source code for DLSS leaked, with several references to the Switch Pro dating as far back as 2019:

#### Turing GPUs	#### Turing GPUs
Turing GPUs provide the same basic graphics functionality present in the previous generations GPUs after second-generation Maxwell GPUs, as well as a num	The NVN Windows reference implementation is supported on Turing-based GPUs but
The NVN Windows reference implementation is supported on Turing-based GPUs but it does not support any Turing graphics features that are not present in second-	Ampere-based GPUs are more preferable since they are more compatible with the NVX implementation.

The leak confirmed our prior information across the board, including that the Pro is based on Nvidia's Ampere GPU architecture and will support not just DLSS, but also ray tracing.

There are actually several interesting sections of leaked DLSS code in Nvidia's data breach. If you recall our earlier discussion on intergenerational compatibility, and

specifically our point about NVN being the API that Nvidia developed for Nintendo, you'll understand why references in the DLSS code for "NVN2" struck a bell for us. And other references in the code basically confirm everything else we go on to discuss here. For example, the source code has several references to T239, a variant of the T234, a known reference for Nvidia's Orin SoC family – which brings us to our next major point below.

2. More evidence the new Switch SoC will come from Nvidia's Orin family

Orin is Nvidia's only SoC family that would meet the Switch Pro's needs. Indeed, all signs point to Orin being the SoC "key" that fits the 4K DLSS "lock" – a game-changing revelation, given what it implies. For now, just keep in mind the following points:

a. Nvidia must be working on a variant of the Orin chip for the Switch.

Orin is the only SoC capable of upscaling to 4K using DLSS with the appropriate power consumption profile. It will almost certainly be scaled down for a portable gaming console, i.e. customized for low wattage, but Orin it must be.

For basic specs, see the table below. We think we're looking at a SoC that will be roughly four to eight times more powerful than the existing Switch family chipset, a massive leap in power unlike anything we've seen Nintendo do in decades. And while we can't know with certainty what this variant Orin chip will possess in terms of its exact specs, we can get close. Given what we know about the larger Orin family, the new SoC will have 12 ARM A78 cores, an Ampere/Lovelace-based Nvidia GPU, a dramatic increase in RAM, and more.

NVIDIA ARM SoC Specification Comparison			
	Orin	Xavier	Parker
CPU Cores	12x Arm "Hercules"	8x NVIDIA Custom ARM "Carmel"	2x NVIDIA Denver + 4x Arm Cortex-A57
GPU Cores	Ampere iGPU (?? cores)	Xavier Volta iGPU (512 CUDA Cores)	Parker Pascal iGPU (256 CUDA Cores)
INT8 DL TOPS	200 TOPS	30 TOPS	N/A
FP32 TFLOPS	?	1.3 TFLOPs	0.7 TFLOPs
Manufacturing Process	7nm?	TSMC 12nm FFN	TSMC 16nm FinFET
TDP	~5-45W	30W	15W

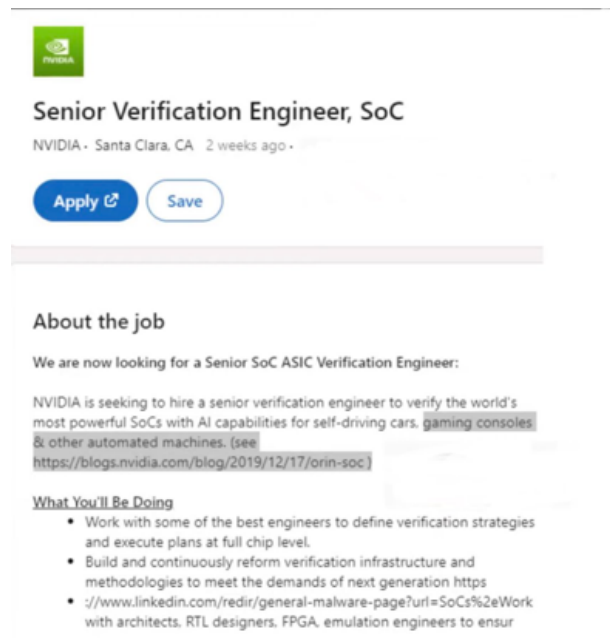
In any case, if Nvidia and Nintendo really are using Lovelace, the new SoC will have a truly cutting-edge GPU architecture.⁶⁷

b. Nvidia's Tegra and Xavier SoC's are nonstarters

While it's technically possible for Nvidia's Xavier SoC to run DLSS, other factors, particularly power consumption, make it impractical. Moreover, while Tegra chips can do basic AI upscaling, the upscaling the Nvidia Shield uses is for movies and TV and categorically does not work for videogames. In other words, Orin is the only Nvidia SoC that can do DLSS 2.0 efficiently enough to strike an acceptable balance between processing power and battery life. Certain Orin variations use as little as 5-15 watts.

c. Nvidia is actively creating Orin-based game development tools

The only game console Nvidia works with is Nintendo, so it stands to reason that any game development tools it's creating will be for use with Nintendo consoles. And besides the total lack of evidence suggesting that either Nvidia or Nintendo are using Xavier for anything related to gaming, we know that Nvidia has been actively creating Orin-based game development tools thanks to a link in a recent Nvidia job application, shown below.



⁶⁷ A great discussion on these topics and more can be found here: <https://www.youtube.com/watch?v=cUJtIK94Djc>

What you'll be doing:

- Collaborate with software engineers, architecture teams to craft, develop, test and optimize graphics stacks like Vulkan, OpenGL and other proprietary graphics APIs
- Collaborate and maintain foundational software technologies for the graphics APIs - like resource management, process scheduling and hardware scheduling
- Engage directly with customers and support teams to develop and improve their world-class products
- Work on solutions to use artificial intelligence in graphics technologies like Nvidia's DLSS 2.0
- Take part in Performance optimization of various SW components of the Tegra graphics and system software stack
- Communicate optimally with various teams throughout the company, as well as customers and partners

The highlighted link⁶⁸ was to an ORIN-based Nvidia blog post that was quickly *removed* after the fact, likely due to the job posting's clear reference to console gaming and fear investors would read between the lines. While the blog post is still available on Nvidia's website, the fact that they removed the link from the job posting offers us another powerful and clear-cut "tell" we're on the right track. After all, if there is nothing to hide, why remove it in the first place?

In fact, the highlighted sections above offer several critical insights. The first strongly suggests the new SoC is part of the Orin family, as already noted. The second tells us the job requires applicants to use artificial intelligence in graphics technologies, specifically calling out Nvidia's DLSS 2.0. And the third proves our contention mentioned earlier about Orin's architecture being fully compatible with the Tegra chipset's Maxwell-based GPU, given the language about taking part in performance optimization related to various software components of the Tegra graphics and system software stack. All data points that substantiate rumors we've independently verified elsewhere.

Finally, another job application, shown below, highlights that **Nvidia is pioneering next-generation graphics development tools for game consoles**, once again pointing to Orin as the SoC that will power the Pro:

⁶⁸ <https://www.electronicdesign.com/markets/automotive/article/21118951/nvidias-latest-soc-zeros-in-on-auto-robotic-apps>



Senior Game Console Developer Tools Engineer

NVIDIA · Durham, NC · 3 weeks ago · 6 applicants

Apply

Save

Are you passionate about 3D graphics, GPUs, and low-level, close to the hardware programming? Have you ever dreamed of helping bring video games to life? Do you want to work with a fast, agile, and experienced team? Are you ready to move at the speed of light?

NVIDIA is looking to hire a deeply technical, creative and hands-on software engineer to pioneer the next generation of Graphics Developer Tools for Game Consoles. You will work with the NVIDIA Graphics Tools team to build tools that enable developers worldwide to harness the full power of NVIDIA GPUs. We are looking for a low-level programmer to help us provide the best possible experience for game developers seeking to debug and optimize their games.

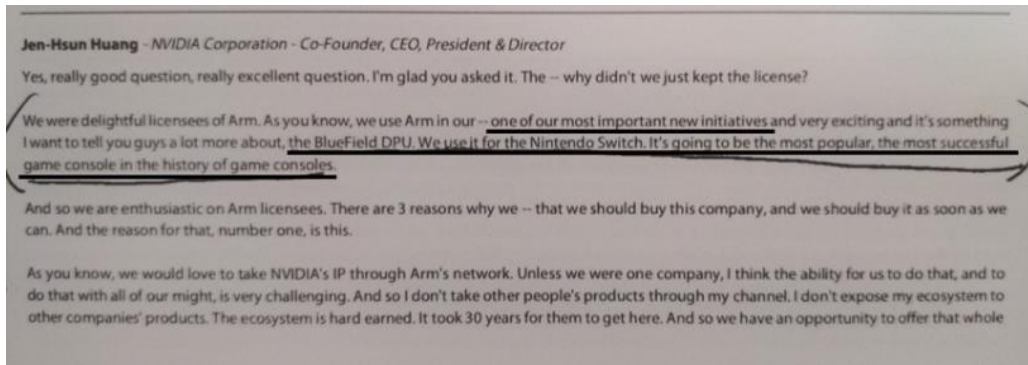
Our logic is simple in that the existing Tegra chipset used in the current generation of Switch family devices is based on comically outdated 2013-era technology.

Consequently, we know that the job post isn't referring to the Tegra X1 as the "pioneering next generation of Graphics Developer Tools for Game Consoles", and we're pretty sure the Tegra isn't even being produced anymore, anyway. And again, the only console maker that Nvidia works with is Nintendo, so it's not a reference to another Nvidia partner. Yet again, the Orin-Switch Pro shoe fits.

d. Nvidia is using the BlueField DPU with the Switch

Nvidia CEO Jensen Huang's commentary from a quarterly conference call with investors last year (shown in part on the next page) suggests that Nvidia will use the BlueField DPU with the Switch Pro.

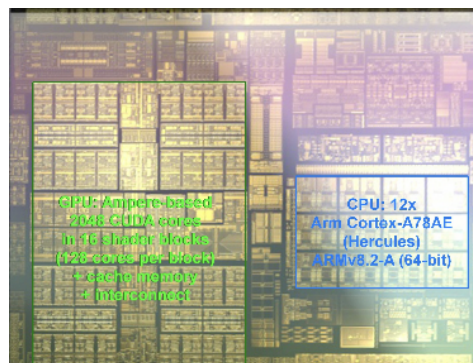
What's notable about the BlueField DPU? It's a piece of cutting-edge technology that Nvidia claims is the world's most powerful software-defined, hardware-accelerated data center infrastructure on a chip (a mouthful, we know). CEO Huang described it as one of Nvidia's most important *new* initiatives, calling it *very exciting* and something he's looking forward to talking about more "when it makes sense to do so."



Moreover, Huang explicitly stated “We use it for the Nintendo Switch,” to which we can only reply: Which one? After all, it certainly isn’t being used in any Switch hardware currently on the market. Commentary like this would downright bizarre if Huang weren’t indirectly referencing the eventual release of much more powerful Switch hardware. Why else would he be looking forward to discussing the topic “when it makes sense to do so”?

e. A well-known, highly credible leaker confirms it

“Kopite” is the pseudonym of a long-time Nvidia insider with an incredibly impressive track record of accurately predicting the company’s new products. Last summer, he claimed⁶⁹ that Nvidia’s new Nintendo T239 SoC would be a custom version of the Orin T234, pictured below:



Normally we don’t put much stock in pseudonymous tipsters, but Kopite’s credibility is unparalleled. Perhaps the best example of his reliability was his precise prediction of Nvidia’s entire Ampere chip stack a full year before its eventual release. And at any

⁶⁹ <https://mobile.twitter.com/kopite7kimi/status/1403200552473829377>

rate, the leak of Nvidia's DLSS source code we discussed above has confirmed Kopite's findings.

f. Orin chips should be cheap and plentiful

It's natural to wonder how Nintendo would be able to secure an adequate supply of such a powerful, cutting-edge SoC at price point it can afford, especially given its history over the last few decades of getting the most out of mature, low-cost technologies. Nonetheless, it appears Nintendo has struck a supply arrangement that offers it the best of all worlds: a high powered SoC chip that is cutting edge, affordable, *and* plentiful.

The natural question is how in the world did that happen? Well, being the strategic partner of a market leader like Nvidia helps. But the real answer may lie in the inefficiencies of the chip manufacturing process itself, specifically the industry's practice of "binning" chips. "Binning" means sorting a production run of chips into batches based on varying levels of quality or how well-manufactured each chip turned out to be, in terms of factors like how much voltage it requires to run, how cool it runs, and how well it performs when overclocked. For example, a chip maker like Samsung might sort the chips from a production run into "Bin 0" (which meet minimum standards for usability), "Bin 1" (which require less voltage, run cooler, or can handle modest overclocking), and "Bin 2" (the highest performing chips in all the above areas).

The 2020 TechPoweredUp article on the next page shows how Nvidia and Samsung sorted Ampere chips into three such "bins".⁷⁰ So what happens to lower-binned chips? After all, they're usable. They're not manufacturing rejects. They're just not the best performers of the bunch. In practice, they're often salvaged by modifying their underlying performance characteristics and selling them at a significant discount for use in products or applications with less-demanding chip requirements.⁷¹ For example, a lower-binned chip can be repurposed and sold by reducing its clock frequency or disabling its non-critical functions. In Nintendo's case, this would just mean disabling everything not related to gaming. And because Nintendo doesn't require Bin 2-level Orin chips, **it's likely to be able to get as many as it needs once production runs start to ramp up.** We say that because it's a near certainty that a relatively high

⁷⁰ <https://www.techpowerup.com/272052/nvidia-geforce-rtx-ampere-chips-feature-three-binning-tiers-mostly-good-dies-are-present>

⁷¹ You might imagine that chips, being so incredibly complex, would need to be manufactured absolutely perfectly in order to work at all. But in fact, putting subpar chips to other uses is par for course in the industry. For example, some 30% of all Ampere chips made by Samsung for Nvidia ended up being repurposed for other uses outside of automobiles after landing in the lowest-quality "Bin 0" tier.

percentage of Orin chips produced for the car industry won't have sufficient yields to qualify for their originally intended end market.

Friday, September 11th 2020



NVIDIA GeForce RTX Ampere Chips Feature Three Binning Tiers, Mostly Good Dies are Present

by AleksandarK | Sep 11th, 2020 06:52 | Discuss (66 Comments) 🗨️

Chip binning is a process of sorting out the manufactured silicon by quality. That means that each chip that comes from the silicon wafer is tested and sorted by different features. For example, a chip is tested for how much voltage it takes for operation, how cool it runs, and of course how it overlocks. By putting their chips through various testing, manufacturers often create binning tiers, where they can differentiate good and bad chips, so they know where to send, and if they should send the chips. The biggest and most complex approach for sending chips is for graphics cards. As there are different AIBs, manufacturers like NVIDIA and AMD need to send them chips of various qualities to incorporate in their products. It is a rather time-consuming and complex process to find out the bin type and the tier of chips, however today we are getting some information from Igor's Lab.

According to their sources, it is said that NVIDIA's latest GeForce RTX Ampere lineup features three binning tiers. There is "Bin 0" which represents an okay chip that can perform as intended, "Bin 1" chips which are good processors, and "Bin 2" processors which represent the best quality chips with the highest performance characteristics. These "Bin 2" dies run cooler compared to the rest and achieve higher overclocking speed. In reality, the binning represents coordination between the chip designer (NVIDIA in this case) and the manufacturer (Samsung with its 8N 8 nm process). It is said that from the complete pilot run of Ampere chips, Samsung ends up with 30% of the "Bin 0" dies, 60% of "Bin 1" dies, and only 10% of "Bin 2" dies. The production period was quite short and these numbers are good for Samsung, as they probably didn't have much time to work on it, so we can expect these numbers to improve.

Which brings us to a related point: Because Orin's main end market is cars, Orin family chipsets are likely to see high production volumes with resulting scale merits that keep prices down. This is the Apple model's "mobile cost and innovation curves" in action: Nintendo gets to piggyback the R&D spend of giant corporations, exploiting the cost curve and innovation cycle of the vast auto semi ecosystem for the benefit of all its stakeholders.

Other notable industry dynamics include the historically noncyclical nature of auto semi demand. Prior to the pandemic, the market for silicon in cars was considerably more stable than those for other semiconductor end markets, given that the automobile industry was (and even now still is) in the first inning of its own digital transformation. In other words, demand for these chips is strong and likely to get even stronger in the years ahead, and regardless of macro factors.⁷² And increasing production volumes for cars means more excess supply, and more excess supply equals more chips available to be repurposed for companies like Nintendo.⁷³

⁷² For a solid read on the ongoing digital transformation of the car industry, this article from Fabricated Knowledge offers some great perspective on the tailwinds propelling the industry forward: <https://www.fabricatedknowledge.com/p/the-digital-transformation-of-cars>

⁷³ Note too that even if the supply/demand picture for Orin chips in cars is tight due to production capacity issues, there should be plenty of chips available for Nintendo's Switch Pro.

On the other hand, we may be overthinking it. Nintendo could just be purchasing a variant version of the Orin SoC via a dedicated production line that piggybacks the traditional Orin lines. In this case, the outcome remains the same as Nvidia would almost certainly have guaranteed Nintendo a certain percentage of production at attractive prices well within its intended budget.

Finally, on the off chance that the supply of variant Orin chips at the 7nm node remains tight despite the dynamics discussed above, any issues will likely be resolved far sooner than most expect due to Apple's announcement that it will be shifting production to the 5nm node. Apple's move should free up a ton of supply at the 7nm node, clearing the pandemic driven bottleneck in lockstep. And that means finding enough chips should be relatively easy for Nintendo.

The bottom line is that Nvidia and Nintendo's groundbreaking partnership should not only give Nintendo a steady and reliable supply of cutting-edge chips at low cost, Nvidia can offload lower quality chips that would otherwise be a total write-off. It's a win-win where both parties are significantly better off in the end.

g. Straight from the horse's mouth

Recent commentary from Nintendo CEO Shuntaro Furukawa aligns perfectly with the fact pattern laid out throughout this section. In a Q&A session following Nintendo's September 2020 press briefing, he said that "[i]n the past, Nintendo used to look at conventional technology that enabled a lower price and appeal to users. However, it is now exploring cutting-edge technology." We think that's a pretty big hint that the Orin SoC is at the heart of Nintendo's Switch Pro plans. Even better, it flips yet another consensus narrative – that Nintendo will always lag other console makers when it comes to the raw technical horsepower of its hardware – firmly on its head.

In sum, we've shown what the Switch Pro should be capable of and how its components can be sourced in a cost-effective manner even in a supply-constrained environment like today's – all but certifying a debut in the near-term, and without having to sacrifice on technical specs or price along the way.

We've also put this fact pattern together to highlight how examples like these, when taken together, paint a powerful picture that is suggestive of a single outcome – in this case, the imminent release of dramatically more powerful hardware. The great fictional detective Sherlock Holmes put it like this: small pieces of information may in themselves look to be of little or even no importance but may clarify when taken together should they all point in the same direction.

Speaking of famous detective novels, there is still more key aspects of the Pro's story that our partners should understand, as we lay out below.

APPENDIX 2: WHY THE SWITCH PRO IS SO IMPORTANT

In Appendix 1, we laid out several pages of evidence showing that the Switch Pro is on the way. But why are we so focused on the Pro? Of course it's another iteratively improved hardware device, as called for by the Apple Model. But we think the Pro will be particularly important for Nintendo, for several reasons:

A. Lessons of the Wii era

While the Wii was successful in certain respects, helping to broaden the appeal of videogames and bringing parents and kids together for innovative family fun, it also delivered several humility-inducing wakeup calls that changed Nintendo for good. The secrets of the Wii's success – unique, low-cost, motion controlled hardware and great interactive games – just wasn't enough to sustain user interest over time. We won't bore you with an extensive list of direct quotes from former Nintendo president Satoru Iwata or an expansive overview of the lessons Nintendo learned more generally. However, we do need to review a few of those learning moments to better understand the company that sits before us today.

For example, it's undoubtedly true that the Wii broke sales records when it first hit store shelves in late 2006, but those sales – and user engagement in general – quickly dried up. Software sales peaked in 2009 before falling off a cliff, dropping upwards of 75% by 2013 despite the Wii having doubled its installed base in the intervening years. So the first lesson Nintendo learned was that it doesn't matter how many consumers purchase your hardware if they don't play consistently or for long.

Which brings us to the second critical lesson for Nintendo, this one related to the perils of creating low-cost hardware that serves functionally as a closed first party gaming console for hobbyists, rather than a dedicated console purpose built for more serious gamers. Unfortunately, by seeking to appeal more to casual gamers, the strategy ultimately backfired for Nintendo. And the price paid was steep considering the cost of reaching all those new consumers ultimately meant alienating not just third-party developers with the Wii's dramatically underpowered hardware and motion-sensor controllers, but the company's core customer base as well. The fact was that in the eyes of many longtime Nintendo fans, the Wii, with its lack of hit games, simplistic graphics, and gimmicky controllers, was more of a toy than the sort of purpose-built videogame console for dedicated gamers that loyal Nintendo users had come to expect.

In an ironic twist of fate then, the very things that lead to the Wiis dramatic initial success also sowed the seeds of its early demise. For example, as already mentioned, the Wii's pipeline of great first-party games dried up after only a few years as Nintendo began focusing its software development efforts on the disastrous Wii-U. And given third-party titles were largely non-existent to begin with, new software releases on the console ground to a halt. And with no first- or- third-party games to play to keep users engaged, people stopped playing. Or as Mathew Ball put it, midway through the seventh generation Nintendo's Wii was underpowered, under-supported, and light on games. As a result, by the middle of the Wii's life cycle, most Wiis had long been covered in dust.

The takeaway is that as Nintendo knows better than anyone that the current generation of Switch family devices is now five years old and competing against its peer's 9th generation of consoles. And for that reason, it must maintain some minimum viable technology threshold if it wants to remain competitive. Granted, Nintendo has done an amazing job over the last five years keeping Switch users highly engaged with a consistent slate of hit first and third-party games, and the launch of its first cloud based online service, Nintendo Switch Online. On the other hand, Nintendo knows from experience that the Switch won't keep selling like it is today without a major technological refresh of its hardware. This is critically important because it shows Nintendo has not only learned from its past, but it's also doing something about it by getting out ahead of that decline with the Switch platforms first major upgrade.

In sum, by addressing technological obsolescence in addition to its focused efforts attracting third-party game developers and maximizing the engagement of its 100m-strong user base, Nintendo is doing what needs to be done to keep its market leading Switch platform at the top of the sales charts. And not just this year or next, but indefinitely – once again, just like the iPhone.

B. Price and technology: Following Nvidia's lead

Another reason Nintendo would put cutting-edge technology in the Switch Pro is because sticking with the old Tegra chipset makes no sense for either Nvidia or Nintendo. To say the same thing in a slightly different way, it's in Nintendo's best interest to use a chipset that benefits both parties, rather than waste Nvidia's time and talent by sticking with the status quo.

We suppose that, in theory, Nintendo could walk away from the partnership and try to build a new GPU from the ground up, but that would almost certainly end in disaster given that (1) SoC design isn't in Nintendo's wheelhouse, and (2) Nvidia has

played a key role in building the Switch OS and its NVN API from the very beginning. That means that if Nintendo walked away, it would have to rebuild the Switch's codebase from scratch. That's never going to happen. Full stop.

Indeed, it's far better for Nintendo to just rely on its strategic partnership with Nvidia, its market-leading supplier. Not only does it get to leverage all Nvidia's advancements in design and GPU architecture with minimal effort, but the leverage it provides Nintendo within the supply chain is enormous. And again, it's more of the same regarding Nintendo's ability to leverage Nvidia's software stack, which was not only designed from day one to be continuously upgraded and improved, but to be compatible with different form factors across Switch family "generations." In other words, following Nvidia's lead on the software side is arguably every bit as mission critical to Nintendo's long-term success as Nvidia's expertise in hardware and/or the semiconductor supply chain.

Before we move on, let's not forget that a Nvidia-backed Pro will have a brand-new, radically more efficient chipset that represents a quantum leap in power that will be comparable to, or slightly better than, Sony's PS4 Pro and Microsoft's "mid-cycle" Xbox One equivalent. Indeed, a PS4 Pro-equivalent chip like the Orin variant T239 is more comparable to a PS5, practically speaking, because it will only have to render at a fraction of the resolution to get the same result. And with DLSS, ray tracing, and various other new performance upgrades that will let the Switch Pro upscale games to 4K, it's genuinely hard to embellish or overstate its impact.

Of course, a SoC like that is exactly what Nintendo needs to remain at the top of the sales charts, as we just discussed. And that's because the Pro's Orin variant SoC is a true game changer. First, because it means porting over "next-gen" games from Sony's PS5 and Xbox's Series X won't be a problem – and that obviously holds true for PS4 and Xbox One games, too. Second, the magnitude of the upgrade should finally get hardcore gamers on the Switch train for good, effectively doubling the Switch platform's TAM with the flip of a switch. We could go on but suffice to say that the idea of Nintendo abandoning its partnership would be on the high side of totally insane.

In sum, by following Nvidia's lead, Nintendo gets the best components made in the best factories for the best prices, and pretty much everything else it needs to compete. Does that remind you of Apple? It should.

C. Optimizing the Switch platform for third-party developers

As we touched on earlier, the best way for Nintendo to press and leverage its market position is to fix its hardware-software ecosystem's remaining flaws. That means that

if Nintendo wants to entrench its dominance and extend its lead over rivals, it must regain technological parity with its hardware and fix the technical debt associated with its online infrastructure. One without the other simply won't get the job done. And again, no one knows this better than Nintendo.

It's true that Nintendo could continue to produce great first-party games for the current generation of Switch hardware, even if it fell further and further behind rival companies' devices in terms of raw power and technical specs. However, an unambitious path forward like that would not just harm its culture, it would alienate major third-party developers in droves. As we've already mentioned, most publishing giants' hit games remain unavailable on the Switch five years after its launch, not because developers don't want their titles on the platform, but because Switch devices in their current form simply aren't powerful enough to run faithful versions of most of today's multi-platform blockbusters. Full stop.

Luckily, Nintendo is hard at work closing the loop above. It's just common sense in the end. For example, if you want to attract great game developers and hence, all the global blockbusters that Nintendo customers are itching to buy, it's wise to get to work figuring out how they can make it maximally compelling for all of these gifted game makers to cross the line to its side of the platform aisle. Obviously, Nintendo would very much like to add to its 100m-plus installed base of active users. It would also very much like to offer a wide range of popular third-party games in the eShop so it can sit back and collect its 30% cut. But again, to do that, it knows that it's going to have to meet third-party developers' needs in two key ways:

- First, it has to offer them hardware powerful enough to run their best games without dumbing them down or otherwise degrading the user experience. Thankfully, the Orin “system on a chip” variant (discussed in Appendix 1 above) will put an end to all that.
- Second, it must provide state-of-the-art network services (including highly lucrative in-app purchases, DLC, and subscription services) that let third-party titles deliver the same high-quality online gameplay users experience on other platforms. Should the big N deliver, third-party developers and Nintendo stand to gain enormously as engagement skyrockets and the pure-margin third-party gravy train rolls in.

Once Nintendo addresses these two points, third-party holdouts should adopt the Switch platform *en masse*. And as industry analyst Ben Thompson has said, if Apple's experience tells us anything, it's that while platforms are established through product

leadership, they flourish and sustain themselves by empowering and entrusting external developers to build something so compelling that customers fall in love with not just the hardware, but the experience that runs on top of it. For Nintendo, that means providing not just more powerful hardware, but the network infrastructure needed to drive sustained high levels of user engagement for all games running on its platform, first- and third-party alike.

D. Portable gaming competition

Speaking of Ben Thompson, his remark years ago that initially he didn't appreciate how technological progress made it possible for a handheld device like the Switch to challenge dedicated home consoles and PCs was an insight that helped us see early on the significance of Nintendo's ongoing business model transformation.

But we weren't the only ones. Valve, another industry leader and Apple Model pioneer, recently announced it would be entering the handheld gaming device market. Its Steam Deck, an AMD-powered portable gaming PC, is set to go toe-to-toe with the Switch later this year. Valve is a serious competitor whose efforts can't be dismissed out of hand, and we think the threat of competitive pressure from the Steam Deck is just one more reason why Nintendo aims to position the Switch Pro at the cutting edge.

In short, we're not too worried about the Steam Deck. An Orin SoC-powered Switch Pro should have no problem beating it handily in the marketplace and on its own terms. For example, we believe the Steam Deck's x86 APU will drain a lot of power. (Reliable estimates put its battery life at about half that of Switch family devices). And its reliance on a Proton compatibility layer to run Microsoft Windows games on its Linux-based OS will further consume performance. Toe-to-toe, the two systems aren't even close to comparable from a raw power perspective.

The Steam Deck is also bigger than any Switch, more at home in a bag or backpack than a pocket. One could even say the Steam Deck's size borders on the comical. It's certainly big enough to question its utility as a portable gaming device outside the home. We could go on talking about marketing budgets and a dozen other factors all in the Switch's favor, but the bottom line is that we expect the Steam Deck will fall far behind the Switch Pro in unit sales. Competitively speaking, the Pro is simply in another league⁷⁴.

⁷⁴ Outside of the lock-in Valve has with PC gamers with large existing libraries of games and saved player data on Steam, we suspect the organic demand for the Steam Deck will be low.

APPENDIX 3: A “CONSOLE IN A CONTROLLER”

There are credible rumors that Nintendo aims to release a “console in a controller” in the relative near term as part of its larger product roadmap, expanding the Switch family with a low-end form factor that would sit comfortably below the Lite’s \$199 price point.

Will it happen? It’s hard to say, given the lack of hard evidence to date. However, it would make sense on several levels. First, unlike Apple, Nintendo has barely even scratched the surface of what it can do in terms of expanding the form factors in its product portfolio.

Second, the evidence thus far suggests such a device would leverage Nintendo’s peerless library of gold-plated IP and mastery in controller design to reimagine NSO as a cross-platform subscription business built on emulated classics and relatively low-cost peripherals (i.e. vintage console controllers).

Third, according to a recent report from Citigroup, this “console in a controller” would be able to connect directly to a wide range of external displays including PCs, TVs, and iOS and Android devices by storing its game data in the cloud as well as the controller. This is important because it means there would be no need for a dock, just a display.

If true, this low-cost product would offer the cheapest ticket yet into Nintendo’s one-of-a-kind software-based ecosystem full of evergreen classics, exclusive online multiplayer titles, and more. And for that reason alone, we expect it would meaningfully expand NSO’s TAM.

In any case, at this point in our diligence we don’t have a firm view on whether such a device will see the light of day, but it would make all the sense in the world. After all, it would let Nintendo combine its unrivaled IP library of classic games with new hardware – a concept it’s executed before with its updated Genesis and N64 controllers released in conjunction with NSO’s N64 expansion pack, and with its the wildly successful NES and SNES “classic edition” consoles (shown on the next page).

The latter, if you’re not familiar, were miniaturized remakes of the original consoles that came pre-loaded with a few dozen NES and SNES games as part of Nintendo’s effort to better capitalize on nostalgia-fueled marketing trends. And capitalize it did. Demand for the classic edition consoles dwarfed supply, with the NES Classic selling 3.6m units and the SNES Classic 5.3m before Nintendo finally pulled the plug.

Intriguingly, Nintendo’s decision to end production of these hit products was part of its plan to accelerate the digitization of its sales by redirecting its classic console

customers toward its NSO online subscription service. So a low-priced controller that pushes gamers toward NSO would be exactly what we'd expect from the new guard at Nintendo.



Think about it: In one fell swoop the company would gain a near perfect low-cost channel to expand recurring revenue, build customer scale, aggregate data, increase user engagement, and deepen product penetration per household – all core priorities highlighted in the company's investor presentations in recent years.

Moreover, taking NSO multi-platform by offering consumers a “Netflix-like” digital app full of classic games from vintage consoles could meaningfully grow NSO's steady-state attach rate. And all while meaningfully expanding the Switch family installed base – and without cannibalizing Nintendo's dedicated console segment along the way. And again, it would play perfectly to Nintendo's existing strengths.

Keep in mind too that unlike its peers, Nintendo doesn't have to spend large sums of money every year creating new content from scratch or licensing it from others in its bid to become of the Netflix of classic gaming. Its high-quality, mostly cost-free content library of vintage games from retro consoles and controllers is already bought and paid for. IP like that is like oil that seeps back into the well.

APPENDIX 4: MOVIES AND TV

As already noted, Nintendo recently earmarked some \$440m to further its push into feature films and TV. While it hasn't provided disclosure on exactly how (and how much of) this money will be spent, we believe its high-level game plan is obvious.

In short, we think Nintendo is beginning to build out a "Nintendo Cinematic Universe" (NCU) – its own version of Disney's Marvel Cinematic Universe ("MCU") – simply based on the magnitude of its announced investments in visual content to date. Add in management's recent commentary, the recent appointment of Illumination's founder to its Board of Directors, and various other tells and hard data points, and it seems the company sees visual content becoming a foundational pillar of Nintendo's business in future years. So for these reasons and more, we see Nintendo working its way up to releasing one or more "NCU" movies per year over the next five years, in much the same way that Disney has done with its MCU.

And candidly, we couldn't be more pleased. The flywheel effect of having feature films driving a virtuous feedback loop that will meaningfully expand console and game sales is a sound strategy from where we stand. In fact, out of all the Nintendo's initiatives to expand the number of people who encounter its IP⁷⁵ this is far and away our favorite. Granted, it's hard to precisely estimate how much of an impact Nintendo's movie and TV push will actually have, but for several reasons, we're confident it will be considerable.

First, because we expect Nintendo's share of the new *Super Mario* movie's first-run box office will be as much as 2% of the company's entire FY 2021 revenues, based on a comment buried in the footnotes of Nintendo's notice to shareholders regarding its 81st AGM⁷⁶ Second, Nintendo is taking production risk with its movies, so it's not just sitting back and skimming a royalty off the top of the box office receipts.

⁷⁵ Nintendo believes that having more people encounter its IP will help it boost videogame sales among people who have either stopped playing Nintendo games or who never did play them in the first place. We agree.

⁷⁶ "[W]hile the [Super Mario Bros. movie] project is not currently generating revenue for [Nintendo] as it has yet to be released, in the future, revenue received by [Nintendo] from the film distributor is expected to amount to within 2% of the consolidated sales of the most recent fiscal year."

Management is on record stating that Nintendo will own the global distribution rights to *Super Mario* and other Nintendo-Illumination movies in perpetuity, and that it intends to leverage these rights for future business opportunities once these feature films leave theatres. Sounds good to us.

Between first-run domestic ticket sales and global distribution rights, we believe that every Nintendo-Illumination movie stands to generate material, extremely high-margin, recurring revenue regardless of what Nintendo's cut at the box office ultimately may be. For example, based on the comment mentioned above, Nintendo seems to expect its cut of the *Super Mario* movie's box office to reach roughly \$230m (based on Nintendo's \$11.5bn in total FY 2020 revenue). And that's before including any of the longer-tailed recurring licensing revenue it will earn in perpetuity from monetizing its global distribution rights once each film leaves theatres. In other words, as Nintendo's visual content initiatives start to come together over the next 5 years, it could easily layer in a few hundred million a year if not more once its content library begins to hit critical mass. In fact, Sony just inked a quarter billion a year deal with Netflix a few weeks back.⁷⁷

Of course, Illumination's track record strongly suggests that *Super Mario* (and other "NCU" movies) will meaningfully move Nintendo's needle – not just eventually, but this year. The consistency of Illumination's production costs and, to a lesser extent, its movies' box office performance, is nothing short of amazing.

We don't want to sound over the top, but honestly, we've never seen a reliable box office money machine like this before. Illumination is truly in a league of its own, as the table of its films' financial performance showed earlier in this report.

Will Illumination's Nintendo movies continue the above trend? Considering the ubiquitous nature of Nintendo's beloved brand and characters, we're tempted to just say yes and leave it at that. But there are plenty of other good reasons to think *Super Mario* will crush in theatres and ultimately put-up numbers north of Illumination's biggest franchise, *Despicable Me*. For example, Nintendo's decision to commit over \$400m toward visual content (and its appointment of Illumination head Christopher Meledandri to its board of directors) recently suggests that it's confident they will. Remember, they've already seen the result, which is another way of saying that Nintendo wouldn't be so confident if it weren't extraordinarily pleased with the *Super Mario* movie. Also, the \$400m investment mentioned earlier on is more than enough to cover marketing and production for another three or four movies, if not more, depending how Nintendo and Illumination are splitting the production and marketing

⁷⁷ <https://variety.com/2021/film/news/netflix-sony-pictures-pay-1-starz-output-1234946413/>

costs. That kickstart should be more than enough to set Nintendo on the path to turning out one or two movies a year.

As we've said, it's hard to know exactly what Nintendo's push into movies (and TV) will be worth. However, it hardly seems like a stretch to imagine it resulting in \$1bn or more of extremely high-margin recurring revenue every year. That suggests this growth vector should be worth at least \$20bn, if not more, at maturity.