Apple Inc. (AAPL)

Investment Thesis

Apple’s growth and financial success are underpinned by its ecosystem and strategic expansion into high-margin (70%+ gross) digital services. Apple’s introduction of the Vision platform, marks a significant venture into spatial computing. Despite initial adoption hurdles primarily due to its premium pricing, the platform is anticipated to evolve into a key element of Apple’s ecosystem, offering immersive experiences that merge with the physical. We believe the Vision platform will sustain future growth as iPhone sales soften. We recommend a BUY rating with a target price of $180 representing a 7.1% upside from Apple’s current market price of $168.

Drivers of Thesis

- **Vision**: The Vision Pro represents Apple’s strategic foray into spatial computing, with potential for significant growth as the platform matures. We estimate a CAGR of 63.1% over the forecasted period (through 2033).
- **Services**: With a projected 12.4% CAGR, the revenue from Apple’s high-margin services is poised for growth. This upward trend, driven by the greater demand for digital content and cloud services, provides strong profit potential for investors.

Risks to Thesis

- **Regulation**: Apple faces regulatory scrutiny for its integrated ecosystem and services business. Issues like the 30% commission on in-app purchases and exclusive arrangements, such as making Google the default search engine on Apple devices, could be impacted by antitrust actions, potentially altering revenue streams.
- **Supply Chain**: Apple’s reliance on a complex global supply chain, heavily concentrated in China and Taiwan, exposes it to geopolitical tensions, trade disputes, and other disruptions. Efforts to diversify manufacturing to countries like India and Vietnam might mitigate some risks but could also introduce new challenges and inflate costs in the short to medium term.

Earnings Estimates

<table>
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<th>Year</th>
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<th>2022</th>
<th>2023</th>
<th>2023E</th>
<th>2024E</th>
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Company Description

Apple is a technology firm with an integrated ecosystem of products and services. The company currently has 2.2 billion active devices. The company’s growth prospects lie in expanding digital services and developing its Vision spatial computing platform. However, regulatory concerns over its integrated ecosystem could threaten the profitability of its service business.
Apple Inc.

Apple is an innovative technology firm with a recognizable brand. The firm leverages its brand to sell customers a sticky and profitable ecosystem of products and services. Apple’s active install base comprises 2.2 billion devices. We expect this number to grow. The firm’s product categories include the iPhone, iPad, Mac, Vision, Wearables, Home and Accessories. Apple is also a digital services business selling cloud storage, digital subscriptions, including video and music streaming, and more.

We believe Apple’s ecosystem will serve as a long-term competitive moat.

**iPhone**: The iPhone is Apple’s flagship device and serves as the nexus of its users’ digital lives. Beyond its role as a communications device, the iPhone is also a camera, internet browser, and multimedia device. The iPhone is ubiquitous in society and populates hundreds of millions of pockets across the world.

The iPhone is settling into its maturity stage. New models do not materially differ from previous generations. As a result, iPhone turnover rates are abating, yielding softer growth. The **Valuation** section below further discusses iPhone sales.

**Revenue Segments**

Apple’s ecosystem is its most important competitive moat. The integration of proprietary hardware and software provides a seamless user experience. For example, a Mac user can use Apple’s Sidecar feature to turn an iPad into a wireless, low-latency secondary display. Files can be wirelessly shared across all Apple devices instantly using AirDrop. The list of features is vast and, most importantly, exclusive to Apple devices. Because of this deep integration, each device is part of a broader consumer experience controlled and monetized by Apple.

Apples’s ecosystem is designed to be self-reinforcing, as the total utility of each device is unlocked when used in tandem with other Apple products. This interconnectedness drives consumers to choose devices like the Apple Watch, which is most effective with an iPhone. This synergy influences initial purchases and encourages users to continue investing in Apple products.

**Sales: $383B**
Source: Apple 10-K, 2023

Source: Apple 10-K, 2023

Apple’s dominant position is eroding as Chinese manufacturers such as Xiaomi and Huawei compete for market share. In Q1 of 2024, iPhone deliveries fell 9.6% from 55.4 to 50.1 million units. We expect Chinese iPhone sales growth to continue softening as China pursues technological sovereignty.

Source: Statista
Mac: Apple offers a diverse array of personal computers, from entry-level laptops to professional machines. All Mac computers run Apple’s macOS software. Its lineup comprises the MacBook Air, MacBook Pro, iMac, Mac mini, Mac Studio, and Mac Pro. Apple maintains a 9.8% market share for PCs, trailing only Lenovo and Dell. The popularization of work-from-home boosted sales throughout the pandemic but has since fallen, with a 27% decline in 2023 (YoY).

In 2020, Apple ditched Intel chips in favor of its own ARM-based architecture. By vertically integrating the processor’s design, Apple achieves superior performance and longer battery life. Today, Apple’s most advanced chip architecture is the M3 processor.

The Mac lineup is susceptible to product cannibalization. The iPad and Vision platform are its most significant threats. iPads (discussed below), paired with a keyboard, serve many of the same basic functions as a Mac and generally cost less. Moreover, the flagship iPad model flexes Apple’s M2 chip, giving ample processing power on par with the latest Macs.

While in its infancy, the advent of Apple’s Vision platform is on a collision course with the Mac. Inside the Vision Pro is a competent M2 processor that displays virtual content in both augmented and virtual reality. Users can access an internet browser like a Mac, install third-party applications, run Microsoft Office, and more. Unlike a Mac, the Vision Pro can simultaneously augment multiple displays, giving users a multi-monitor setup anywhere they go. Moreover, a keyboard and mouse can be connected to mimic the laptop experience. Over time, as the platform matures, we see Vision devices eroding a portion of Mac sales.

iPad: Apple holds a commanding position in the tablet market with a 41% market share. iPads exist at the intersection of mobile and desktop computing. Despite having processing power on par with Apple’s most advanced laptops, iPadOS limits the device’s functionality. Nevertheless, the iPad excels for specific applications like handwritten notes and education. The iPad is a mature product, and users upgrade their devices once or twice a decade. Akin to the Mac, the Vision platform will threaten the relevancy of the iPad long term.

Vision: The Vision Pro is Apple’s newest product category. Retailing at $3,499, the Vision Pro is not a mass-market device. It aims to give developers a glimpse of Apple’s future: augmented (A/R) and virtual reality (V/R). Apple refers to A/R and V/R experiences as “spatial computing.” While somewhat cumbersome to wear, the Vision Pro excels at rendering digital overlays of the world around the user. Users can turn a dial to switch between A/R and V/R, look at an object, and pinch their fingers to navigate Vision Pro’s software. Initial impressions say it is quite intuitive, with the word “magical” being used to describe the experience.

On the whole, early reviews for the Vision Pro are mixed. Some applaud the impressive immersion and intuitive look-and-pin interface. Others argue it is too expensive, bulky, and lacks a killer feature. As a first-generation product, the truth is somewhere in the middle. Because of its price, it lacks sufficient customer adoption to justify developer engagement. Hence the lack of a killer app. A small customer base also diminishes the device’s network effects, leaving users isolated in both virtual and physical worlds. The price barrier to adoption will wane as the technology matures and economies of scale drive down.
costs. We remain optimistic about the Vision platform in the long term.

We imagine the Vision Pro evolving into a pair of unobtrusive smart glasses providing an A/R experience that blends digital and physical worlds. The best analogy is the transition from the bag phone to the smartphone. For those born into the smartphone era, a bag phone’s size and functionality (or lack thereof) are laughable by today’s standards. Children of the 2030s will reflect similarly when reflecting upon the Vision Pro. We expect scale and iteration to improve performance while driving down cost. Paired with artificial intelligence technologies, there are many use cases. For example, users wearing the device could access information about any object in their frame of reference. Alternatively, visualized directions could be overlayed on city streets to give maps a new dimension. The list goes on. Developers will use technology similar to the advent of the iPhone’s App Store to create new applications. Further discussion of the Vision platform is in the Valuation section below.

**Wearables, Home, and Accessories:** Wearables include Apple’s smartwatches and wireless headphones lineup. Apple watches run on the watchOS operating system and includes the Apple Watch Ultra 2, Apple Watch Series 9, and Apple Watch SE. Apple markets its smartwatches as health and fitness devices. To this end, Apple watches offer a wide array of functionalities such as sleep cycle tracking, heart rate monitoring, electrocardiogram capabilities, temperature measurements, step counting, medication reminders, irregular heart rhythm alerts, and more.\(^2\)

Apple’s wireless headphones line includes AirPods, AirPods Pro, AirPods Max, and Beats products. Apple’s Home offerings include its Apple TV streaming and gaming device and its HomePod and HomePod mini speakers. Accessories comprise a litany of first and third-party-designed cases, chargers, cables, watch straps, and more.

Wearables, Home, and Accessories is, on average, 10% of sales. Apple is expected to refresh its AirPods lineup in late 2024 with better audio performance and USB-C compatibility.\(^2\) We believe customers are waiting for this refresh and expect it to boost sales in 2024 and 2025.

We believe wearable device sales will continue to grow as Apple introduces more health and fitness features. Recent reports suggest Apple is exploring a health tracking ring and AirPods outfitted with fitness sensors and low-resolution cameras connected with AI.\(^2\) The Apple Watch’s success as a health and fitness device provides us with confidence that Apple can continue to grow this market with refreshed products and new wearable devices.

**Services:** Leveraging its products, Apple sells accompanying digital services which are often reoccurring subscriptions with gross margins above 70% (5Y). For context, products earn, on average, a gross margin of 28%. Services include Advertising, AppleCare, Cloud Services, Digital Content, and Payment Services. Digital Content encompasses various materials, including applications, books, music, videos, games, and podcasts from the App Store and other Apple marketplaces. Additionally, Apple offers exclusive content and services through subscriptions like Apple Arcade (gaming), Apple Fitness+ (personalized fitness), Apple Music (curated music and radio), Apple News+ (news and magazines), and Apple TV+ (original content and live sports).

Services are a primary driver of top-line growth, representing 22% of sales with a five-year CAGR of 16.5%. Services are exposed to risk in light of recent regulatory scrutiny. For example, $18 billion, or 21% percent of all services revenue, flows from an arrangement with Google to make its product the default search engine on Apple devices.\(^6\) In an antitrust complaint filed against Alphabet (Google’s parent company), the DOJ argues this arrangement between Apple and Google is anticompetitive. An adverse ruling could threaten this revenue stream and materially alter services revenue. Further discussion of services is found in the Valuation section below.
Geographic Segments

Apple reports the following geographic segments: Americas, Europe, Greater China, Japan, and the Rest of Asia Pacific. In 2023, Apple faced a 3% reduction in total net sales, equivalent to $11.0 billion. The decrease is attributable to a strong US dollar.

Cost Structure and Profitability

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<td>Services</td>
<td>70.8%</td>
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<tr>
<td>Total Gross Margin</td>
<td>44.1%</td>
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Source: Apple 10-K, 2023

Apple’s improved gross margin is attributable to its shift towards digital services, increasing from 17.8% to 22.2% of total sales (2019 – 2023). We expect services to continue growing, eventually accounting for 32.4% of total revenue in 2033. This results in a gross margin of 44.2% in 2033E.

R&D and SG&A expenditures remain relatively flat as a percentage of sales and are proximate to the five-year averages of 6.7% and 6.3%, respectively. Last year’s operating margin suffered slightly due to the repatriation of foreign currencies into a strong US dollar. We do not expect this trend to persist in the long term. Relative to our model, we assume R&D and SG&A expenditures to remain consistent with their three-year averages of 6.3% and 6.8% of total sales, respectively. See the Valuation section below for further discussion of operating expenses.

Debt Maturity Analysis

Apple carries $106.6 billion in long-term debt, with an average annual payment of $10.1 billion through 2026. In 2023, Apple’s cash and marketable securities totaled $61.6 billion. Operating cash flow was $110.5 billion in 2023. The firm’s liquidity position is sufficient to meet its current obligations. According to FactSet, the S&P rates Apple AA+. Dividends and stock repurchases reduced the firm’s cash position, but we remain confident in Apple’s solvency and creditworthiness in the long term.

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<td>Total</td>
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Source: Apple 10-K, 2023
According to S&P Global, Apple earned an ESG score of 52 (out of 100). Below is a breakdown and peer comparison for the industry. In all three categories, Apple outperforms the industry mean for technology firms. Climate strategy and privacy protection are the strongest contributors to its score. Supply chain management and human capital development are areas for improvement.

**ESG Analysis**

![ESG Analysis Chart]

Source: S&P Global

China

Apple may lose out on its largest market as China seeks to reduce its reliance on Western technology firms. Recent reporting suggests that China seeks to “delete America” from its technology infrastructure by 2027. If accurate, this concerning trend would seriously hinder the firm’s future prospects. China is a massive market with middle-income wealth. If the Chinese market sours on Apple, the firm’s total addressable market will materially shrink. This, in turn, will depress services growth since every foregone device is a lost opportunity to sell a digital service.

**Antitrust Litigation**

**DOJ:** In March 2024, the Justice Department filed a civil action against Apple, alleging anticompetitive behavior. The complaint focuses on Apple’s efforts to interfere with the ease of switching operating systems. While not exhaustive, the DOJ cites the following actions as evidence of monopoly power: (1) blocking the development of super apps, (2) suppressing mobile cloud streaming services, (3) excluding cross-platform messaging apps, (4) diminishing the functionality of non-Apple smartwatches, and (5) limiting third-party digital wallets. These actions allegedly frustrated competition and resulted in outsized profits. If the DOJ prevails, Apple’s services business may suffer, including its ability to charge a 30% commission on in-app purchases.

We do not see changes in the other practices cited above as impactful. Cloud gaming is not a dispositive factor when choosing a phone, and cross-platform messaging platforms like WhatsApp already exist. As for smartwatches, Apple maintains roughly 22% of the $44.2 billion smartwatch market. Smartwatch sales are expected to grow at a CAGR of 7.2% through 2028. Greater interoperability may invite competition, but foregone sales will be immaterial as a percentage of total sales.

**Epic Games:** In 2020, Epic Games, maker of Fortnite, filed a lawsuit against Apple, accusing the company of anticompetitive behavior. The chief issue was Apple’s mandatory 30% collection fee on in-app purchases. Epic sought to circumvent the tax by introducing a link directing its customers to Epic’s marketplace. Legal proceedings ensued after Apple removed Fortnite from the App Store for violating its terms and conditions. The district court largely ruled in Apple’s favor, finding it did not have monopolistic power. The court ruled that Apple cannot prevent developers from steering users to alternative marketplaces. The US Ninth Circuit Court of Appeals recently upheld the lower court’s ruling, and the Supreme Court denied Epic’s appeal. Importantly, Epic’s legal battle with Apple focused on the digital mobile gaming transactions market. The DOJ’s complaint is much broader, making Apple a monopolist in the smartphone and performance smartphone markets.

**Q1 FY24 Earnings**

In Q1 of FY24, ending December 30, 2023, Apple reported $119.6 billion in sales, a 2% increase YoY, despite a shortened quarter. The company achieved an all-time high in EPS at $2.18, up 16% YoY. iPhone sales contributed significantly, with revenues of $69.7 billion, a 6% rise. Services also hit a record with $23.1 billion in revenue, an 11% increase YoY. Despite these gains, iPad and Wearables categories saw declines of 25% and 11%, respectively. Apple’s install base of devices surpassed 2.2 billion, signaling further ecosystem growth. Because Q1 captures holiday sales, it would be inappropriate to annualize Q1 performance as a measure of future financials. Apple does not provide guidance for the remainder of the year.
European Union (EU) Regulations

The EU recently passed the Digital Markets Act (DMA). The DMA seeks to reign in the power of “gatekeepers” or large firms that act as intermediaries between businesses and customers. Apple is a gatekeeper under the DMA. Accordingly, it must adhere to specific regulations adverse to its profitability. Specifically, Apple is constrained from favoring its offerings over those of third parties; it cannot obstruct consumers’ interactions with external businesses, nor can it impede the removal of pre-installed applications. Moreover, Apple must ensure interoperability with third-party services in specific contexts; Apple must grant businesses access to the data generated on its platforms; and Apple must provide advertisers with autonomous tools to validate the effectiveness of their advertisements. Apple must also permit businesses to engage in transactions and promotions outside its ecosystem. Introducing third-party app stores could affect services revenue in the EU.

Should Apple violate the DMA, it would likely incur substantial penalties, calculated based on its turnover or the total revenue generated from its normal business activities annually. The company could incur fines up to 10% of this turnover for initial infringements, escalating to 20% for repeated violations. Additionally, periodic penalty payments may be imposed, amounting to up to 5% of Apple’s average daily turnover, to enforce compliance.

INDUSTRY TRENDS

Supply Chain

Like many technology firms, Apple relies on third-party manufacturers and a vast supply chain to build its hardware products. Supply chain links tend to concentrate in China and Taiwan, especially for semiconductors. Some outlets indicate China accounts for 90% of all Apple products produced. Geopolitical tensions and pandemic disruptions have exposed the fragility of this supply chain to risks beyond the industry’s control. To diversify manufacturing, Apple and other tech firms are investing heavily in India and Vietnam. While inflationary in the short to medium term, moving supply chains to friendlier nations in safer neighborhoods is a long-term advantage. To account for the China decoupling, we added 50 basis points to the three-year average COGS for products in our forecast.

Generative AI

Today, the most useful application of artificial intelligence is generative AI, a form of AI that responds to natural language inputs to generate new content, including text, images, audio, and video. Large language models (LLMs) such as ChatGPT fall into this category. Natural language is the next step forward in computer software and will overtake graphical user interfaces (GUIs) in the same way GUIs obsoleted command-line interfaces. We expect Apple to adopt AI and LLMs into its Siri voice assistant and other applications. LLMs’ knowledge base and capacities are a natural synergy for the digital assistant. Recent reports indicate Apple is negotiating with Google to license its Gemini LLM model. Generative AI will also likely make its way to the macOS and the Vision platform. We expect Vision devices to incorporate AI to give users contextual information about the world around them using the device’s suite of cameras and sensors.

MARKETS AND COMPETITION

Technology Hardware

Tech hardware category comprises desktops, laptops, smartphones, smartwatches, and tablets. Dell and HP primarily sell desktops and laptop hardware. Garmin focuses on smartwatches and GPS hardware.

A significant portion of hardware manufacturing is outsourced to third parties. The outsourcing model requires fewer physical assets and raises profitability. A significant percentage of manufacturing and the supply chain occur in foreign countries. All firms are exposed to supply chain risk, especially in geopolitically sensitive areas such as China, South Korea, and Taiwan.
We attribute Apple’s outsized relative performance to its software offerings. Many of the firms in the peer group either lack a software arm, or software remains marginal to the overall business. Supporting this notion is the comparable performance of Meta, which is primarily a software business.

Apple’s relatively large ROE is the byproduct of its stock-repurchase and dividend payout plans. Over the last five years, the company spent $392.2 billion in share repurchases and $72.5 billion in dividends. We expect Apple’s equity account to replenish with ROE settling at 42.0% by 2033.

Regarding competitive threats, the metrics suggest that the other companies do not immediately threaten Apple’s profitability. However, HP shows a strong ROIC at 37.0%, indicating that it uses its invested capital effectively, which could signify strong strategic positioning and potential competitive strength over the long term.

**Technology Software and Digital Services**

Technology software includes PC and mobile operating systems, as well as computer, internet, and mobile applications. Digital services comprise various sorts of digital subscriptions like music or video streaming.

The PC operating system market is a duopoly between Microsoft’s Windows and Apple’s macOS. The smartphone is also a duopoly, with Apple competing against Alphabet’s Android. Meta and Alphabet compete with Apple for advertising revenue. Lastly, Amazon, Netflix, and Spotify are alternatives to Apple TV+ and Apple Music.

Unlike hardware, software is an easily scalable high margin business. That said, content-driven companies like Netflix and Spotify appear to lag behind other software firms in most operating metrics. This is likely due to expensive and often risky content acquisition costs. Apple does not publish its streaming financials in detail, but content costs may explain the recent uptick in overall services costs. Gross margins for services decreased from 71.7% to 70.8% YoY.

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**Forecasted Margins**

We expect ROIC to improve over the forecasted period. The driving force is Apple’s capital efficiency services business. Declining ROA stems from Apple’s increasing cash position over the forecasted period. Data values in the following chart are found in the Ratios section of the attached Appendix.

**ECONOMIC OUTLOOK**

**Inflation:** The economic outlook for the United States is affected by inflationary pressures and the Federal Reserve’s monetary policy responses. The surge in inflation to 9.1% in 2022 led to a series of rapid interest rate hikes by the Fed. Recent commentary by Fed Chair Jerome Powell suggests cuts will arrive by the end of the year. While promising, the market is overestimating the rate of reductions. As seen below, the tail of market expectations suggests multiple rate cuts. This is too
optimistic. In the best-case scenario, we believe the Fed will cut rates only once in 2024.

As savings shrink, consumers must either pull back on spending or use debt to sustain their behavior. In the long term, neither is sustainable. A weakening American consumer may bring the US into recession. As a consumer products and services company, this type of weakness would likely have a material impact on Apple’s business and overall profitability.

Factors such as a robust labor market, increased government spending, and evolving global supply chains are likely to maintain inflation at persistently high levels, warranting an extended period of elevated interest rates. Recent data from March’s CPI report provides credence to this theory, with inflation rising 3.5%.18

Sustained inflation may impact Apple by increasing production costs, potentially squeezing profit margins or resulting in higher prices for its devices. Higher prices could lower consumer demand, particularly in more price-sensitive markets. Apple’s global operations might also face varying impacts due to different inflation rates across countries. In the long term, inflation could force Apple to adjust its strategic pricing and cost management practices to maintain profitability and market position.

**Consumer Spending:** The United States economy appears resilient despite the highest interest rate environment in nearly 20 years.13 Employment remains below 4%, the S&P 500 is reaching all-time highs, and the economy expanded 2.5% in 2023.14,15,16 While seemingly positive, certain headwinds should caution investor sentiment. One concern is consumer spending, the primary driver of recent US GDP growth.16 We believe much of this spending draws from stimulus checks and excess earnings saved during the pandemic. As seen in the graphic below, lockdowns and government stimulus boosted total household savings to $5.7 trillion in 2021.17 As of early 2024, the trendline shows households steadily depleting these reserves down to $745.7 billion.

**iPhone:** The iPhone is Apple’s flagship product and primary revenue driver. We expect this trend to continue over the forecasted period, albeit as a lesser percentage of total sales. Our forecast assumes a CAGR of 5.8%, with growth moderating towards the terminal period. Insights from 2021 (the latest year of data) indicate that 34% of active iPhones are at least three years old.19 Apple’s strategy to ensure new software remains compatible with older models also extends the usable lifespan of its devices. Aside from diminishing battery life, there is minimal
incentive for users to upgrade their iPhones more than once every few years.

While slowing, we expect future growth to remain positive. The iPhone remains the nexus of the Apple ecosystem, and synergies with the Vision platform will drive sales. While confident in the future of spatial computing, the iPhone is poised to remain the center of one’s digital life and Apple’s flagship offering.

### iPad:
iPad sales will peak in 2027 and continually decline as a percentage of total sales. Our reasoning centers on creative destruction. For most, the primary benefit of a tablet is its larger screen, which makes it the premier mobile device for productivity and media consumption. The advent of Apple’s Vision platform is eroding this competitive advantage. Through AR/VR technology, users can project large digital windows as large as their field of view. Moreover, Vision users can display multiple windows in a 360-degree frame of reference. The iPad’s fixed display cannot compete with this level of immersion. Accordingly, the Vision platform is superior for media consumption and productivity. Additionally, the Vision Pro runs native iPad apps since its software is based mainly on iPadOS.

Exacerbating this march toward irrelevancy is the increasing size of the iPhone. First released in 2010, the iPad’s 9.7-inch display was massive compared to the iPhone 4’s 4-inch display, giving it obvious utility. This advantage is less prominent today, with the largest iPhone bolstering a 6.7-inch display.

One of the few advantages remaining is the iPad’s stylus functionality. Professional creatives and students alike will likely continue to buy iPads for this purpose.

Our model projects a CAGR of -4.9% over the forecasted period. Projected growth rates are initially positive before turning negative in 2029 when Vision devices reach price parity with iPads. Given the advantages above, we believe users will abandon the tablet in favor of Apple’s spatial computing platform.

### Mac:
Mac sales are expected to grow steadily at a CAGR of 4.3% through 2033. Our moderate growth reflects the maturity of laptop and desktop computers. Our model assumes slowing growth rates starting in 2029 to reflect greater adoption of Vision devices. While not a direct substitute, Apple’s Vision platform will likely cannibalize some Mac sales. Users who otherwise would buy a Mac for word processing, internet browsing, and other basic tasks are prime targets. Nevertheless, Mac computers remain useful for resource-intensive tasks such as video editing, graphic design, and other professional tasks.
**Vision:** Vision Pro’s growth rates are hard to project as a first-generation product without a sales history. To remedy this issue, our model uses estimates from Statista.20 The forecasts run through 2028. Thereafter, we assume a decreasing average sales price reflecting the sale of newer and cheaper models. Unit volume increases with each price reduction. Our model assumes a terminal average selling price is $1,000, and we project that 100 million devices will be sold. For reference, Apple sold 234 million iPhones, 64 million iPads, and 21 million Macs last year, according to FactSet. Our model projects a CAGR of 63.1% for Vision devices through 2033.

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<td>-</td>
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Source: FactSet

**Wearables, Home and Accessories:** This product category is directly tied to the success of Apple’s other products. The iPhone is a necessary companion for an Apple Watch, and accessories are used with their compatible devices. We forecast steady growth above consensus estimates to reflect pent up demand for an expected AirPods refresh near the end of 2024.21 The CAGR for this category is 8.3%.

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<td>Net</td>
<td>+18.8%</td>
<td>+12.8%</td>
<td>+3.1%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: FactSet

**Services:** Services are Apple’s most profitable revenue stream. We deviate upwards from consensus numbers, reflecting our bullish attitudes toward Apple’s services business. Our growth estimates rest on the stickiness of Apple’s ecosystem. If users cannot flee, they will be stuck buying services from Apple.

While not projected in our model, recent antitrust litigation by the DOJ and new legislation introduced by the European Union may threaten this competitive moat, thereby hindering service sales. Apple’s partnership with
Google and the 30% commission for in-app purchases made through the App Store are the most apparent threats. The CAGR for services through 2033E is 12.4%.

<table>
<thead>
<tr>
<th>Henry Fund</th>
<th>2024E</th>
<th>2025E</th>
<th>2026E</th>
<th>2027E</th>
<th>2028E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consensus</td>
<td>15.0%</td>
<td>15.0%</td>
<td>15.0%</td>
<td>15.0%</td>
<td>15.0%</td>
</tr>
<tr>
<td>Net</td>
<td>+4.3%</td>
<td>+4.8%</td>
<td>+3.6%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: FactSet

Because Apple does not manufacture its products, we do not expect capital spending to differ substantially from past years.

**Cost of Capital**

The weighted average cost of capital (WACC) is 9.8%. Our WACC estimate incorporates the following assumptions:

- **Risk-Free Rate**: 4.2% – YTM 10Y US Treasury
- **Beta**: 1.17 – Average 1Y, 2Y, 3Y Weekly Beta (Bloomberg)
- **Equity Risk Premium**: 5.0% – HF Estimate
- **Cost of Equity**: 10.1% – CAPM
- **Equity Weight**: 95.9%
- **Pre-Tax Cost of Debt**: 4.8% YTM 10Y NVIDIA Bond
- **Marginal Tax Rate**: 16.0%
- **After-Tax Cost of Debt**: 4.1%
- **Debt Weight**: 4.1%

**DCF/EP Model**

Our DCF and EP models yielded a share price of $180. The following assumptions were used:

- **CV Growth of NOPLAT**: 4.0%, reflecting Apple’s history of product development and innovation in disruptive industries, such as consumer electronics and technology
- **CV Year ROIC**: 174.5% using ROIC from the last forecasted fiscal year (2033E)

In valuing Apple, a high-growth tech company with a mix of hardware and software offerings, the DCF/EP model is our preferred measure. Unlike the relative valuation model, which struggles to categorize Apple strictly as hardware or software, the DCF model can value all cash flows equally.

Moreover, the DCF/EP approach is more fitting than the DDM, especially given Apple’s need for continual reinvestment to innovate and remain competitive. Where the DDM might undervalue the firm by focusing solely on dividends, the DCF/EP model recognizes the full scope of Apple’s reinvestment strategies in the dynamic technology industry.

**Operating Expenditures**

**Cost of Sales**: Gross margin is calculated using the three-year average for cost of sales as a percentage of total sales. We add 50 basis points to COS for products to account for the decoupling of supply chains away from China. Products and services are calculated separately to reflect the growing share of services. Our assumptions include 48.9% for products, 5.6% for services, and 3.0% for depreciation and amortization.

**R&D**: As a technology firm, we expect Apple to continue to invest heavily in R&D. This is particularly true as it develops its next-generation Vision device. To forecast R&D costs, we used the three-year average as a percentage of sales. The number our model uses is 6.3%.

**SG&A**: Like COS and R&D, we employed the three-year average as a percentage of total sales. Our assumed SG&A expenditure is 6.8%.

**Capital Expenditures**

Management does not provide guidance for capital spending. Our model uses 2023’s capital outlay of $11 billion and adjusts upward each year for inflation. 2024 capital expenditures are expected to be $11.2 billion.
At a current market price of $168, investors can expect a 7.1% upside for owning Apple. Accordingly, we recommend a BUY rating.

**Fundamental P/E Model (DDM)**

The DDM estimates Apple’s intrinsic value based on future dividend payments and growth prospects. We employed a 4.0% terminal EPS growth rate, ROE of 42.0%, and a cost of equity equaling 10.1%. Our model assumes a dividend payout of 15.2%, consistent with the three-year average payout. The model utilizes a projected P/E multiple of 14.9 in the terminal year (2033E). Together, these assumptions yield a discounted price of $140 per share. Today’s implied price is $147. At current market prices, Apple is overvalued by 12.5% based on the DDM’s price.

**Relative Valuation (P/E) Model**

**Technology Hardware:** The relative valuation model compares Apple against its technology hardware and technology software/digital services peers. Apple is at the intersection of both industries, incorporating proprietary hardware and software into its consumer offerings.

<table>
<thead>
<tr>
<th>Mkt Cap</th>
<th>AAPL</th>
<th>AMZN</th>
<th>DELL</th>
<th>GRMN</th>
<th>HPE</th>
<th>META</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trailing P/E</td>
<td>26.0</td>
<td>64.0</td>
<td>29.0</td>
<td>22.0</td>
<td>13.0</td>
<td>35.0</td>
<td></td>
</tr>
<tr>
<td>Fwd P/E</td>
<td>26.0</td>
<td>44.0</td>
<td>17.0</td>
<td>39.0</td>
<td>10.0</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>P/S</td>
<td>7.0</td>
<td>3.0</td>
<td>1.0</td>
<td>6.0</td>
<td>1.0</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>P/B</td>
<td>35.0</td>
<td>10.0</td>
<td>-</td>
<td>4.0</td>
<td>1.0</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>EV/EBITDA</td>
<td>20.0</td>
<td>22.0</td>
<td>13.0</td>
<td>21.0</td>
<td>7.0</td>
<td>22.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: Yahoo! Finance

The market values technology hardware firms on a broad spectrum. Apple, Amazon, and Meta stand out with their trillion-dollar valuations and high growth expectations. Dell and Garmin share a middle ground with investors expecting future growth. Meanwhile, HP receives the most conservative valuation, suggesting slower expected growth. We believe these valuations are consistent with each firm’s growth stage.

Unlike the rest, Apple, Amazon, and Meta sell digital services in addition to hardware. Dell and Garmin are better described as hardware companies with limited software offerings. Dell sells software solutions through a B2B model, whereas Garmin’s software complements its GPS devices and is aimed at customers. HP is the purest hardware play. Its offerings primarily include desktop and laptop computers that run Windows.

Given its growth prospects and digital services arm, Apple deserves a premium valuation compared to more one-dimensional players such as Dell and HP. As such, the disparities in valuation should not give investors too much pause. Apple is slightly cheaper than the premium investors are willing to pay for the likes of Amazon, Garmin, and Meta using EV/EBITDA. Additionally, while Apple’s P/B appears relatively high compared to its peers, it results from an aggressive campaign by management to return capital to shareholders through dividends and share buybacks.

**Relative P/E Model (Hardware):** The relative valuation model uses the average price-to-earnings ratio for the technology hardware industry. The model employs each firm’s price-to-earnings (P/E) ratios for 2025 and 2026 to determine Apple’s fair price. Using this framework, Apple should trade at $169 based on 2024 EPS and $166 using 2025 EPS. These valuations are consistent with Apple’s recent trading range. A summary chart is below.

<table>
<thead>
<tr>
<th>P/E 24</th>
<th>AAPL</th>
<th>AMZN</th>
<th>DELL</th>
<th>GRMN</th>
<th>HPE</th>
<th>META</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frwd P/E</td>
<td>26.0</td>
<td>44.0</td>
<td>17.0</td>
<td>39.0</td>
<td>10.0</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>P/S</td>
<td>7.0</td>
<td>3.0</td>
<td>1.0</td>
<td>6.0</td>
<td>1.0</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>P/B</td>
<td>35.0</td>
<td>10.0</td>
<td>-</td>
<td>4.0</td>
<td>1.0</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>EV/EBITDA</td>
<td>20.0</td>
<td>22.0</td>
<td>13.0</td>
<td>21.0</td>
<td>7.0</td>
<td>22.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: FactSet

**Technology Software and Digital Services:**

Apple’s closest comparison is Alphabet, likely due to its mobile OS and SaaS businesses. While seemingly high, Apple’s P/B ratio is also a product of its aggressive capital return to shareholders. We expect P/B to normalize to industry norms as the equity account restocks. All other ratios are within the range of its software peers.

**Relative P/E Model (Software and Digital Services):** The relative valuation model using software and digital services companies yields a share price well above Apple’s current market price. This makes sense, given approximately 80% of Apple’s revenue is generated by hardware sales. Using the industry average P/E ratios, Apple should trade at $277 based on 2024 EPS and $255 using 2025 EPS. These prices are a rich premium compared to the current market price.
**KEYS TO MONITOR**

**Digital Services Growth:** Digital services underly many of our model’s assumptions and serve as a primary growth driver. To justify our DCF/EP price of $180 per share, Apple must continue growing its services business. Failure to do so would alter our investment thesis and reduce our valuation. Additionally, the segment’s performance could be influenced by regulatory actions, especially concerning Apple’s default search engine arrangement with Google and app marketplace practices. These regulatory challenges could affect Apple’s ability to monetize its ecosystem’s lock-in effects, potentially impacting the long-term growth trajectory of its services revenue.

**Antitrust:** Apple faces significant scrutiny that could affect its revenue streams. Monitoring outcomes of these litigations is crucial, as adverse rulings could force Apple to alter its business practices substantially, impacting the profitability of its services sector and its overall competitive position.

**China Sales:** China represents a crucial market for Apple, contributing significantly to its global revenue. However, it also poses unique challenges due to geopolitical tensions and local competition. Monitoring Apple’s sales in China is important, especially as the Chinese government pushes for technological self-reliance. This initiative may affect iPhone sales and other Apple products, potentially reducing Apple’s market share in this key region.

**Vision:** The Vision platform is a new product category for Apple. Monitoring the development, market adoption, and evolution of this platform is key. Factors such as technological advancements, pricing adjustments, and the expansion of the app ecosystem will likely influence its success.

**SUMMARY**

Apple’s enduring legacy of innovation, coupled with its strategic pivot towards high-margin digital services, underpins our BUY recommendation, with a target price range set at $170 – $190. The company’s seamless ecosystem, consisting of integrated hardware and software, not only enhances user experience, but also cements customer loyalty.

Looking forward, Apple’s foray into spatial computing with its Vision platform, along with continued services portfolio expansion, will drive significant growth and supplement softening iPhone sales.

Nevertheless, investing in Apple is not without its risks. The company’s expansive global footprint and reliance on an intricate supply chain network expose it to geopolitical tensions beyond its control. Moreover, the evolving regulatory landscape, especially in key markets like the EU and the US, poses a challenge to Apple’s services segment, potentially adversely impacting its margins.

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