CFA Institute Research Challenge

hosted by

CFA Society New York

Team U

The CFA Institute Research Challenge is a global competition that tests the equity research and valuation, investment report writing, and presentation skills of university students. The following report was prepared in compliance with the Official Rules of the CFA Institute Research Challenge, is submitted by a team of university students as part of this annual educational initiative and should not be considered a professional report.

Disclosures:

Ownership and material conflicts of interest

The author(s), or a member of their household, of this report does not hold a financial interest in the securities of this company.

The author(s), or a member of their household, of this report does not know of the existence of any conflicts of interest that might bias the content or publication of this report.

Receipt of compensation

Compensation of the author(s) of this report is not based on investment banking revenue.

Position as an officer or a director

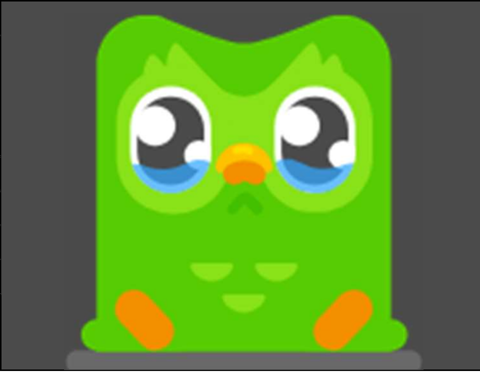
The author(s), or a member of their household, does not serve as an officer, director, or advisory board member of the subject company.

Market making

The author(s) does not act as a market maker in the subject company's securities.

Disclaimer

The information set forth herein has been obtained or derived from sources generally available to the public and believed by the author(s) to be reliable, but the author(s) does not make any representation or warranty, express or implied, as to its accuracy or completeness. The information is not intended to be used as the basis of any investment decisions by any person or entity. This information does not constitute investment advice, nor is it an offer or a solicitation of an offer to buy or sell any security. This report should not be considered to be a recommendation by any individual affiliated with CFA Society New York, CFA Institute, or the CFA Institute Research Challenge with regard to this company's stock.



Duolingo, Inc. (DUOL)

DATE: Jan. 17, 2024
EXCHANGE: NYSE
GICS SECTOR: Technology
INDUSTRY: Software – Application

"Lost in Translation"

Recommendation: SELL

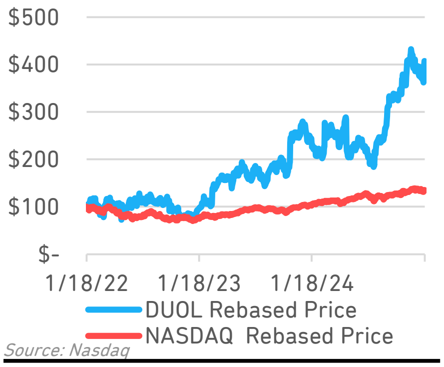
Exhibit 1: Valuation Summary

Market Cap (M)	15,444
Shares Outstanding (M)	43.3
Current Share Price	$ 351.13
P/E Ratio	189.8
P/S Ratio	22.4
P/B Ratio	18.8
P/FCF	64.28
12-Month Target Price	**$285.80**
Downside Potential	**-18.6%**
PEG Ratio	0.24

Source: Bloomberg

**All prices as of close 17 Jan 2024*

Exhibit 2: 3-Yr Share Price Rebased



Source: Nasdaq

Exhibit 3: Financial Ratios

Ratios	FY24E
Net Debt / EBITDA	-13.1x
Debt to Equity	0.4x
EBITDA Margin	6.3%
NPAT Margin	4.1%
ROE	8.6%

Source: Bloomberg

Exhibit 4: Share Price Catalysts

Date	Event	Catalyst
Jan-25	Looming Tik Tok Ban	216% YoY increase in US users learning Mandarin
Nov-24	Earnings Q3	MAU & EPS above Estimates, AI featured
Aug-24	Earnings Q2	Earnings above Estimates, AI Subscription Unveiled
May-24	Earnings Q1	Despite EPS surprise, less impressive growth rates pointed to weaker guidance

Source: Team Analysis

EXECUTIVE SUMMARY

DUOL has revolutionized language learning, but faces headwinds and is overvalued

We are initiating a Sell rating on Duolingo, Inc. (DUOL) based on a 12-month price target of $285.80, representing an 18.6% downside from the January 17, 2025, close of $351.13.

DUOL is the largest language learning app globally, as they have revolutionized teaching through an innovative gamified learning platform which aims to attract and retain users through consistent bite sized lessons. Going forward, DUOL has indicated that AI-driven offerings, math & music lessons, in-app tokens, and global expansion are upside growth drivers and may support stretched valuations. However, DUOL is being priced for perfection despite 2025 showing signs of deceleration.

We view DUOL as an innovative business facing a constant struggle of maintaining relevancy and monetizing users. Due to indications of fragility in Duolingo's competitive edge, investors are recommended to reconsider their positions.

Investment Thesis Highlights

1. Operating trends reversing growth

Although DUOL's user base continues to grow, industry-wide metrics such as Average Revenue Per User (ARPU) & Customer Acquisition Cost (CAC) are both decelerating at -25.1% YoY largely dampening margin expansion hopes. Despite investors betting on DUOL MAX and revenues diversification from the Super Subscription, the slow growth of these drivers will fail to outpace prevailing operational weakness from over-dependance on DUOL Super Subscription.

2. TAM & Demographics do not support projected growth narrative

DUOL faces demographic headwinds as developed markets have reached near maturity. Management has oversold the idea of a global user growth strategy, as DUOL's profitability margins and subscriber penetration rates are damaged; this is due to two reasons: 1) Lesser Developed Nations are less interested in the added convenience and value from a DUOL subscription. 2) DUOL must discount subscription costs to account for less economic viability. For example, users take utilize VPNs to fool DUOL into thinking they are in Egypt where a monthly subscription is $11.51 a yr vs. $59.99 in the USA, an 80.8% discount.

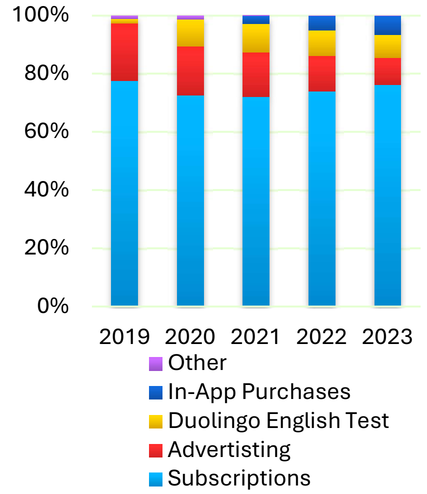
3. Growingly unjustified overvaluations amongst competition

DUOL remains overvalued as investors visualize an impenetrable moat with innovative AI offerings fueling impressive EPS growth through sustained MAU YoY increases and conversion rates. These assumptions reflect a priced in CAGR of 62% over the next 5 years all the while reflecting significantly overvalued Revenues & EBITDA Multiples compared to Ed-Tech and Freemium Software comparables. Furthermore, despite large R&D spend, DUOL's AI-Offering is non-proprietary as they effectively put brand graphics over OpenAI's ChatGPT. This has created opportunities for existing and new market participants to challenge DUOL, such as emerging start-up SPEAK, an AI language tutor receiving funding at a $1B valuation and OpenAI backing. Largely, it seems investors are ignoring the fundamentals and opting for AI hype and vanity growth catalysts in hope of conversion and ROI one day.

KEY FINANCIALS

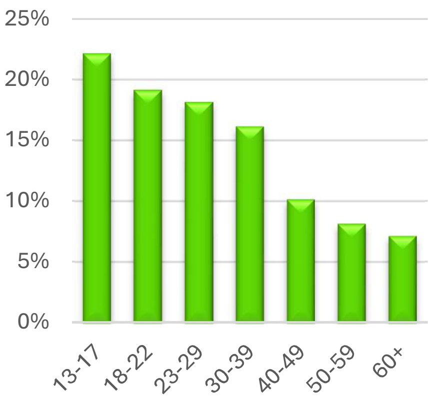
	Historical				Forecast				
($000) (GAAP)	FY20a	FY21a	FY22a	FY23a	FY24f	FY25f	FY26f	FY27f	FY28f
Revenue	161,696	250,772	369,495	531,109	712,026	940,962	1,215,753	1,530,471	1,896,075
Growth		55.1%	47.3%	43.7%	34.1%	32.2%	29.2%	25.9%	23.9%
EBITDA	(13,683)	(57,251)	(61,001)	(6,219)	44,545	115,333	193,587	262,431	318,965
Growth		-318.4%	-6.6%	89.8%	816.3%	158.9%	67.9%	35.6%	21.5%
Margin	-8.5%	-22.8%	-16.5%	-1.2%	6.3%	12.3%	15.9%	17.1%	16.8%
EBIT	(15,939)	(59,977)	(65,871)	(13,314)	36,143	105,264	181,853	249,031	303,899
NOPAT	(16,007)	(60,154)	(66,809)	(15,024)	29,069	90,281	158,212	217,675	266,058
FCF	(26,987)	(66,933)	(80,368)	(28,440)	14,296	73,625	134,026	191,822	238,539
EPS (b)	-1.24	-2.57	-1.51	0.39	1.54	3.25	5.13	6.81	8.22
EPS (d)	-1.24	-2.57	-1.51	0.35	1.37	2.90	4.57	6.07	7.32

Exhibit 5: Product as % of Revenue



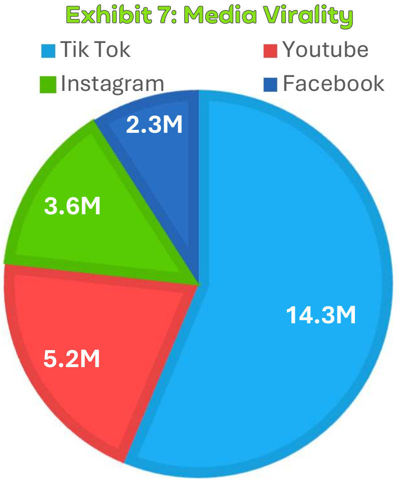
Source: DUOL Investor Center

Exhibit 6: User Age Demographics



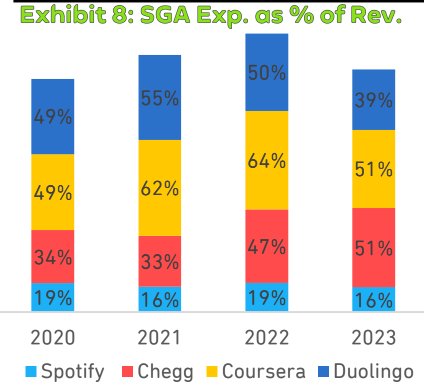
Source: DUOL

Exhibit 7: Media Virality



Source: Team Analysis

Exhibit 8: SGA Exp. as % of Rev.



Source: DUOL Investor Center

BUSINESS DESCRIPTION

Overview

Duolingo is the most popular language-learning app with more than 500 million users worldwide. Founded in 2011, the company has grown with the goal of ensuring education is accessible, enjoyable, and free for everybody. Duolingo achieves this through a freemium mobile app utilizing gamified concepts to ensure a consistent and entertaining learning environment. DUOL historically had great momentum but now faces mounting expectations, in Q3 2024, Daily Active Users (DAU) have grown 54% YoY while revenue increased about 40% YoY. Despite fears of a post-covid slowdown, DUOL has achieved profitability and maintained strong top-line growth.

Business Model

Revenue: The company's main revenue driver, Duolingo Super, comprises about 76% of revenue and offers unlimited lesson attempts, customized learning solutions and an ad-free experience for users. A higher tier subscription recently released, Duolingo Max, has all the features of Duolingo Super and integrates AI Video Calls, allowing users to practice languages verbally. Despite Duolingo Max damaging Q4 gross margin guidance due to higher GenAI and amortization costs, this tech offering is necessary for DUOL to maintain industry dominance. Other revenues have continued to grow with user growth including, Advertising (9% of Rev.), Duolingo English Test (8% of Rev.), and In-App Purchases (7% of Rev.) (Exhibit 5). The Duolingo English Test is an online proctored certification exam awarding a certification of English proficiency and is accepted by 5500+ education institutions globally. Additionally, In-App Purchases were introduced in Q4 2022 and its revenue nearly doubled over 2yrs, these purchases such as gems, streak freezes, and more seek to further monetize DUOLs gamified platform. To maintain these users DUOL utilizes extensive R&D spend and AB testing strategies to curate optimized notifications and lessons to maximize user retention. DUOL's ability to attract new users, retain existing users, and monetizing the learning experience is essential to DUOL's business model and future growth.

Marketing: DUOL relies on their brand and intellectual property to drive organic word of mouth and social media growth. Rather than traditional marketing and advertisement campaigns, DUOL prioritizes following trends through social media such as New Years Eve, Squid Games, or the Olympics. This viral media technique of "wave riding" allows DUOL to be at the forefront of relevancy while engraving their brand as a household name (Exhibit 7). The utilization of these organic advertisements has made the brand mascot, "Duo" the Owl and Duolingo well known amongst users and non-users alike. Their content caters to all ages, especially children who share the largest user base (Exhibit 6). This effectively creates a "Disney Effect" where a subset of children who use the app and are retained as lifelong users, who then create a legacy of language learning as they become adults and purchase subscriptions for their children. Lastly, DUOL has created a cult-like fandom of users who subscribe to the idea of "lifelong learning" and attend events like DUO-Con, an in-person convention for DUOL lovers. DUOL's ability to maintain relevancy in a world of limited technological attention is essential in growing its user and subscriber base.

Developments: On the horizon, DUOL is set to continue rolling out its AI Video Call functionality and a 2D language learning game called Duolingo Adventures. These initiatives are pivotal to DUOL's future as they address a major flaw found amongst users, they can't transition their learning into real world applications. The AI Video Call feature will allow users to get real time feedback and practice verbal linguistics, while Duolingo Adventures seeks to apply learning in graphically appealing real-world scenarios.

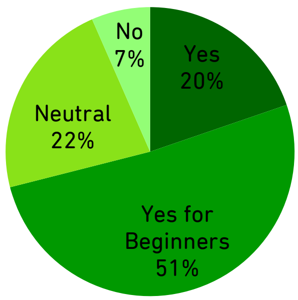
INDUSTRY OVERVIEW & COMPETITVE POSITIONING

Online Language Landscape: The online language learning industry has experienced dramatic growth, driven by global demand for accessible and affordable learning solutions. As of 2024, over 1.5 billion people are learning English globally, underscoring the massive market potential for platforms like DUOL. While competitors like Rosetta Stone, Speak, and Babbel offer subscription-based models, DUOL differentiates itself through its freemium model, engaging gamified learning approach, and extensive language offerings. Online language learning remains an inexpensive and advantageous option for learners versus expensive and inconvenient in-person language schools. Additionally, AI, machine learning, and speech recognition allow online language learning to be incredibly effective.

Competitive Moat: Many competitors continue to emerge as threats to DUOL's competitive moat, where they mimic similar features yet are built to approach differing target audiences like professionals, travelers, and adults who may prefer a more structured learning experience. Speak, a start-up recently raising $78M at a $1B valuation utilizes the same AI API that DUOL uses, and they employ an easy-to-use quick learning platform geared towards travelers and professionals. This demographic carved out of competition, has the potential to pigeonhole DUOL a child focused solution while excluding mature users who use competitor products (Exhibit 6).

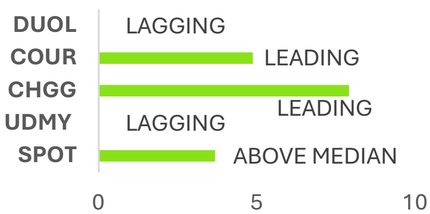
Advertising Competition: Targeted marketing campaigns such as collaborations with WEBTOON and Chess.com continue to be unique amongst language learning and educational platforms, allowing DUOL to stand out amongst competitors. While innovative, these are primarily focused on increasing visibility rather than developing deeper, long-term monetization plans. Investors should be weary that DUOL is highly dependent on marketing virality rather than on pure user growth and profitability, as they attach their brand to social media trends, reflecting their large following (Exhibit 7). Comparatively, competitors like Coursera and Chegg, rely on more traditional methods of approaching customer engagement and thus spend a greater percent of revenues on Selling General & Administrative Expenses (Exhibit 8).

Exhibit 9: "Does DUOL Work?" Forum Research Poll



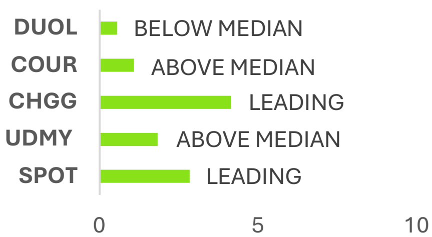
Source: Team Analysis

Exhibit 10: Environmental Score



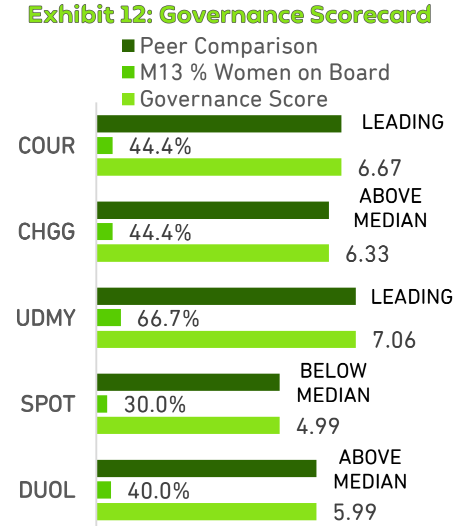
Source: PROXY 14A

Exhibit 11: Social Score



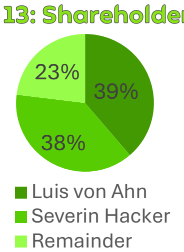
Source: PROXY 14A

Exhibit 12: Governance Scorecard



Source: PROXY 14A

Exhibit 13: Shareholder Votes



Source: PROXY 14A

Product Innovation and Financial Performance: Duolingo continues to push boundaries with innovative features like Duolingo Max, which incorporates generative AI to mimic the experience of a human tutor. For Q4 2024, Duolingo forecasts that the number of paid subscribers will increase on account of deeper conversions and subscription plans with attractive pricing. However, Duolingo will need to increase its R&D expenses, which can hurt profitability.

English Test: Despite its strong positioning, Duolingo faces challenges for its English test such as increasing competition and rising user acquisition costs. However, its investments in AI and expansion into new verticals, like English proficiency testing, provide significant growth avenues. For instance, the Duolingo English Test (DET) saw an 8% YoY increase in website visits in Q4 2024, indicating growing acceptance and utility in the academic and professional sectors.

ENVIRONMENTAL, SOCIAL, GOVERNANCE

Environmental

Environmental Impact: Despite a current environmental score of 0 (Lagging), Duolingo remains committed to improving its sustainability practices (Exhibit 10). By giving sustainable practices top priority across its operations, Duolingo is dedicated to lessening its impact on the environment. Duolingo actively tracks its environmental performance as part of its continuous environmental goals, and it set the stage for future reporting and the use of important sustainability metrics. To save energy and lower overall consumption, Duo outfits its offices with eco-friendly office furniture, occupancy sensors, and LED lighting, among other energy-efficient technologies. To meet its sustainability objectives, Duolingo also intends to choose inclusive and eco-friendly locations for its long-term office buildings in the future. Employees are given stipends to promote less carbon-intensive modes of transportation like walking, bicycling, and carpooling. However, these initiatives have not been reflected in its environmental score rating.

Waste/Consumption: Duolingo's headquarters is dedicated to reducing waste and resource consumption by procuring food from local vendors whenever possible, and lowering transportation emissions. Any extra food is given to nearby NGOs to help them with their social responsibility and environmental projects. With designated stations located around the office, the Pittsburgh headquarters actively carries out extensive recycling and composting operations to minimize landfill waste. As part of their commitment to sustainability, Duolingo formed an Environmental Working Group, which is made up of committed employees who collaborate to discover opportunities for decreasing environmental impact and improving sustainable operations. The company is still working to improve its climate strategy and accounts for these offsets cautiously in its framework for reducing emissions.

Energy Efficiency: Duolingo remains committed to improving energy efficiency across its businesses. By using energy-efficient appliances, switching to LED lighting, and working with designers to maximize the sustainability of office spaces, the organization aims to incorporate sustainable workplace design. They install sophisticated lighting controls, such as occupancy sensors, timers, and adaptive controls that balance direct and indirect lighting requirements, to further cut down on energy usage. To lessen the overall environmental impact, efforts are also being made to improve the efficiency of water, heating, and cooling in office facilities.

Social

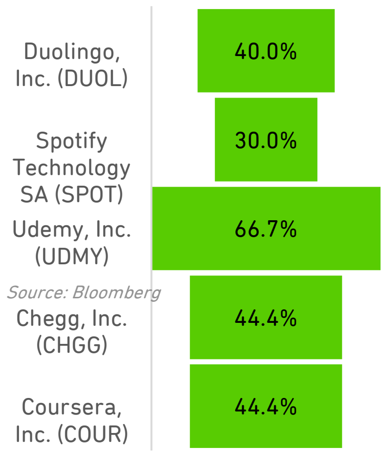
Social Impact: Duolingo's social score currently stands at 0.56 (Below Median), but the company is actively working to improve its social impact through a strong dedication to diversity, equality, and inclusion (DEI) initiatives (Exhibit 11). Duolingo's strategic commitment to being a responsible corporate citizen is reflected in the creation of a dedicated Social Impact function. The business has made local and international efforts to increase educational access and assist the communities in which they operate a top priority.

Workforce: Duolingo promotes a diverse and inclusive workplace, with staff representing over 25 nations and having language backgrounds in more than 15 countries, reflecting the platform's broad user base of over 300 million learners. The company's recruitment efforts prioritize diversity and inclusion, with a recent 50:50 gender balance for new hires and an outstanding 70% identifying as persons of color. These initiatives support Duolingo's objective of having a workforce that reflects the worldwide audience it serves, which will improve its capacity to effectively support a varied student body.

Duolingo provides a number of chances for employees to support their social impact projects in order to further demonstrate their dedication to employee engagement. In addition to serving on non-profit boards and volunteering, employees are urged to use the company's matching gift program, which in 2023 raised $330,245 for a variety of international causes.

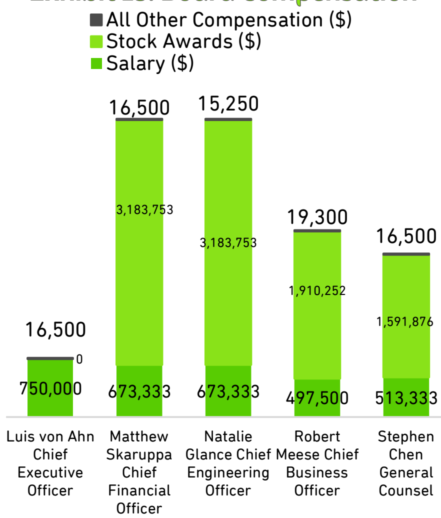
Philanthropic Initiatives: Duolingo's philanthropy endeavors reflect the company's objective of making education accessible to everyone while also being a supportive neighbor in their community. In 2023, the business committed $1 million a year to the Early Learners First program, which aims to improve Pittsburgh's early childhood education. Duolingo has funded nine neighborhood childcare facilities since the program's launch starting in the fall of 2024, it intends to provide tuition assistance to qualified families.

Exhibit 14: % of Women on Board



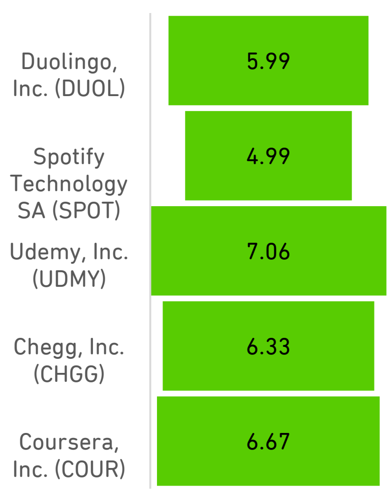
Source: Proxy 14A

Exhibit 15: Board Compensation



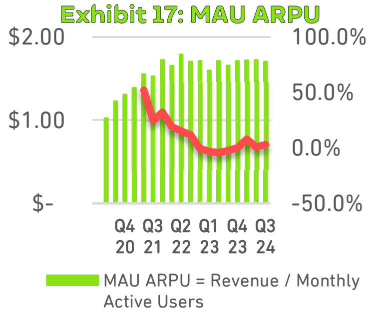
Source: Proxy 14A

Exhibit 16: Governance Scores



Source: Proxy 14A

Exhibit 17: MAU ARPU



Source: DUOL Investor Center

The company's commitment to the arts and cultural enrichment is shown in its Community Arts Program, which launched in 2020 with a $150,000 donation to sponsor public artwork created by local artists in East Liberty, Pennsylvania. Duolingo continues to support local artists and creative endeavors to promote community participation and build a strong community facing brand image.

Engagement: Duolingo's commitment to social impact extends to its employees through a variety of participation options. The company has a volunteer club run by its employees that works with groups like Allies for Health & Wellbeing, FamilyLinks, Humane Animal Rescue of Pittsburgh, and the Homeless Children Education Fund. Workers are encouraged to take part in charitable endeavors, volunteer work, and campaigns that benefit both domestic and foreign societies.

Governance

Class A & Class B Shares: DUOL's dual-class stock structure assigns Class B shareholders voting rights worth $2 per share compared to $1 for Class A shares, to ensure strong management control. Class A shares are held by large financial institutions, such as BlackRock and Vanguard, respectively owning 6.8% and 9% of the outstanding shares. Class B shares are primarily held by two individuals, Luis von Ahn owning 53.7% of the outstanding Class B shares, and Severin Hacker owning 53.5% of Class B shares (Exhibit 13).

However, we find the dual share structure is a significant detriment to investors' governance. Since the majority of Class B shares are owned by two of the company's board of directors, this represents an imbalance of voting power, which can lead to principal-agent problems in the company. This undermines the principle of shareholder democracy and can lead to majority shareholders controlling the company catered to their own needs. This lack of shared ownership can stifle innovation and expose the company to reputational and financial risks, ultimately reducing long-term shareholder value.

Governance Score: Duolingo has a strong governance framework that prioritizes openness and ethical principles. This ensures that its operations are consistent with global norms and stakeholder expectations. The company has an exceptional ESG rating of 23.8. This shows that Duolingo has committed itself to managing environmental, social, and governance risks that are unique to its industry. Every year, DUOL publishes ESG reports to further demonstrate their commitment to transparency. These reports demonstrate the company's success and accountability. Duolingo does this by giving stakeholders comprehensive insights into its social efforts, governance practices, and environmental impact (Exhibit 12). The papers are intended to educate consumers, regulators, and investors on DUOL's initiatives to reduce risks and advance social well-being.

Board of Directors: Duolingo's Board of Directors exemplifies does have independent monitoring. Eight of the board's ten members are independent directors, which guarantees a high degree of outside supervision. Duolingo's board is also diverse with its 40% female representation and three women serving as directors (Exhibit 14). This emphasis on gender diversity demonstrates Duolingo's commitment to inclusivity and has a positive impact on its fair corporate leadership.

Executive Compensation: Duolingo (DUOL) has an equity-based compensation strategy. Restricted stock units (RSUs) are a key component in aligning executive incentives with shareholder interests. In 2023, stock awards made up over 80% of total direct pay for Named Executive Officers (NEOs). This demonstrates DUOL's commitment to performance-based incentives and long-term wealth building. By directly linking their compensation to stock performance, this strategy encourages executives to propel the company's expansion and profitability (Exhibit 15).

Luis von Ahn received a base salary of $750,000 in 2023. This demonstrates his modest remuneration for his crucial role in the company's leadership. In 2023, the total remuneration for all NEOs was $13 million, which was a significant decrease from previous years (Exhibit 15). This decline can be attributable to the large one-time stock grants made during DUOL's IPO year in 2021, which were intended to attract and retain top individuals during a vital phase of growth and transition.

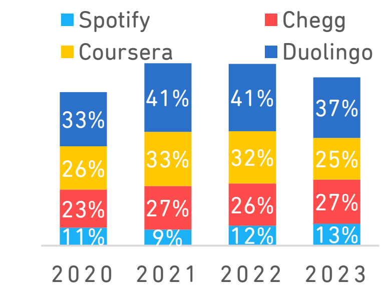
INVESTMENT SUMMARY

Operating Trends Reversing Growth

Revenue: Primary Revenue drivers are slowing given heightened CAPEX and decreasing subscriber conversion. Despite impressive growth trends in metrics like MAU, DAU and Revenue growth (Exhibit 22), Average Revenue Per User (ARPU) has been declining. In 2020, customer revenue per paid subscriber was $73.44, and by 2023, it had decreased 17% to $61.32 (Exhibit 19). Our forecasted base case forecasts that DUOL will only be making $52.65 per subscriber by 2028. Subscriber penetration has also seen slowing, in 2021 there was a 40% subscriber penetration growth YoY; however, by the following year, DUOL had only a subscriber penetration of 25%. In 2023, there was only 6.4% YoY growth. We forecast that this trend will continue to persist, and DUOL will struggle to see significant growth in subscription penetration with 9.4% penetration by 2028. MAU ARPU has also stagnated at approximately $1.72 per MAU since 2022 (Exhibit 17). Given DUOL's trend of stagnancy in MAU ARPU & downtrend in Average Subscription Revenue per Subscriber, they become highly dependent on DUOL MAX reversing pricing suppression and consistently high user growth.

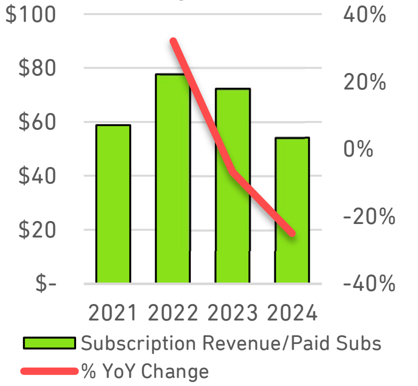
Other drivers such as DET, advertising, and in-game transactions make up 24% of all revenue (Exhibit 5), highlighting a keyway to diversify revenue streams while minimizing risk from over-dependence on subscriptions. Management has emphasized a commitment to grow these revenue streams, however,

Exhibit 18: R&D as % of Rev.



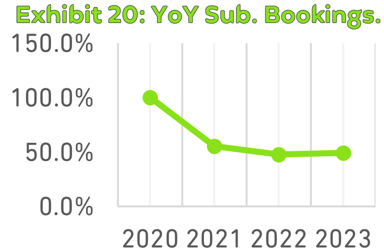
Source: DUOL Investor Center

Exhibit 19: Avg. Sub. Rev. per Sub.



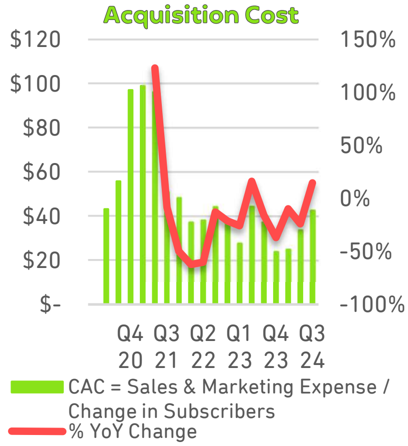
Source: DUOL Investor Center

Exhibit 20: YoY Sub. Bookings.



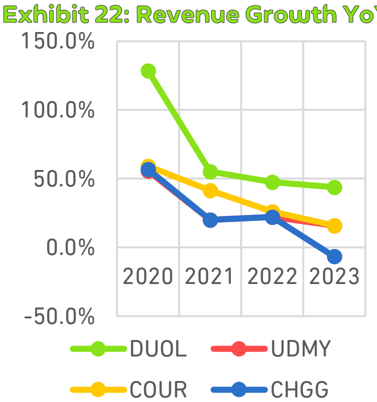
Source: DUOL Investor

Exhibit 21: Customer Acquisition Cost



Source: DUOL Investor Center

Exhibit 22: Revenue Growth YoY



Source: DUOL Investor Center

DUOL has been historically overly dependent on subscription revenue and DUOL Max is set to further this dependency. This outlook of continued undiversified revenue streams with decreasing levels of profitability per subscription warns investors of monetization lagging user growth. This leaves user growth to largely make up for the decreasing monetization of subscriptions to keep up with investors lofty revenue growth expectations.

Expenses: DUOL spends approx. 37% of Revenues on R&D as it is their main operating driver of delivering organic growth (Exhibit 18). DUOL continues to invest in new features such as Duolingo Math and Duolingo Music, as well as more optimizing AI features as they view organic growth to be their key marketing driver and differentiation tactic. While we are seeing DUOL OPEX grow at a decreasing rate, DUOL is limited to how much they cut back on R&D as they must keep their service relevant while competitor technology continues to modernize. We question their efficiency in R&D utilization as new AI entrants have entered the language learning market such as startup Speak who is backed by OpenAI and raised $78M at a $1B Valuation. Inefficient R&D usage is a key concern as their ability to efficiently scale leanly may damage future earnings and dividends to investors.

Customer Acquisition Costs (CAC) have also remained a volatile and growing expense. Q3 2024 highlights a CAC above $40, resulting from an overarching increase trend since Q4 2023's CAC low of $22 (Exhibit 21). We continue to monitor this expense metric closely as it shows DUOL's recent growing difficulty in acquiring subscribers at a low cost.

Total Addressable Market, Not So Addressable

Total Addressable Market: According to DUOL's 10k they believe their TAM to be 2B people, however, this TAM seems to be widely overstated if not already nearly reached. Despite DUOL not posting churn metrics like other freemium software companies, it can be expected that MAU users are much more likely to continuously leave and rejoin the app. For reference, 2B TAM with 50% churn would achieve a max 1B in MAUs. Therefore, we heavily discount the global expansion narrative as its projected profitability is heavily suppressed beyond nearly mature highly developed markets. This is supported by DUOL being a household name synonymous with language learning and largely viral amongst North America and Europe. We expect DUOL's true TAM to reach approximately 1.5B facing a minimum 5% churn rate, thus an effective TAM of 1.425B users.

Demographic Monetization: With highly developed nations across Europe and North America nearing user maturity given DUOL's virality as a household name, the larger addressable market leaves economically lesser developed markets such as Africa, India, China and more to deliver investors desired growth. English being DUOL's most popular language to learn, DUOL's management has excited investors with an emphasis on maximizing user growth by tapping into these developing economies. However, this will continue to lower average subscription revenue as subscription prices are adjusted to appease lesser developed nations economic viability (Exhibit 19). DUOL has significantly lowered the price of their subscriptions in places like India for this exact reason. The price for a monthly subscription in the U.S. is $12.99 per month versus approximately $0.92 in India. It is believed that analysts covering DUOL are largely discounting the effects of this strategic issue. However, these lesser developed nations will generate minimal revenue growth, for two reasons: 1) Money being scarcer, they are less likely to purchase the added benefits and convenience of a subscription. 2) Lesser developed nations are charged at discounted rates resulting in less profitability than originally anticipated by investors. Despite this strategy fulfilling the company's holistic mission of providing democratized language learning, it largely damages the goals of investors who seem to discount the impact of pricing demographics on future subscription monetization and revenues.

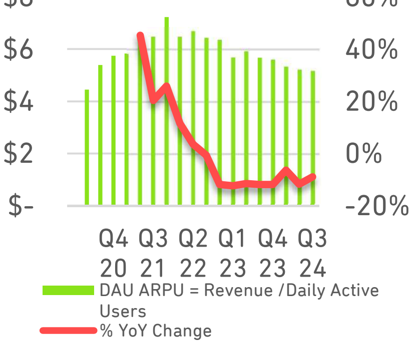
Overvalued Momentum

DCF Analysis: According to our projection of future cash flows discounted to present value and performing a comparative analysis of similar Educational Technology and Freemium companies, we found DUOL to be fairly valued at $285.80 per share. When analyzing and forecasting sales scenarios we determined this base case based off their trends moderating from extreme growth. We notice weakness in their future growth as many headwinds are ignored by investors who seem blinded by DUOL's AI product offerings and DUOL reaching profitability. Primarily our base case points to weakening subscriber penetration, slowing MAU growth, and weakening revenue per paid subscriber. Currently we project MAU Growth to be 24% YoY by 2028, with a Subscriber Penetration at 9.4%, and $66.98 per subscriber.

Overpriced Views: Management has unacknowledged these damaging trends while praising future In-Game Purchase growth, DUOL Super Revenue potential, and impressive Active User growth. This has led DUOL to be highly overvalued relative to peers where their Revenue & EBITDA multiples are 7.7x & 3.3x higher respectively than our comparable average. Lastly, our Reverse DCF estimates a necessary 62% CAGR over the next 5 years to justify its current price of $351.13. Given this analysis it becomes clear that the fundamentals of DUOL have become overstretched as investors maintain lofty expectations of future growth.

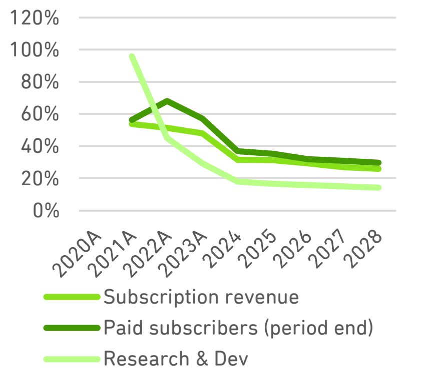
Competition: AI offerings and gamification have become commonplace in the education and language learning world. Although DUOL has been at the forefront, technological and open-source technology has allowed new entrants to storm the market with a translator and computer. For example, privately owned competitor Babbel released an AI bot in Q4 2023, about a year before DUOL. Additionally, emerging start-up SPEAK, an AI language tutor receiving funding at a $1B valuation and OpenAI backing showcases the demand for new entrants to compete and shake up DUOL's language learning market.

Exhibit 23: DAU ARPU



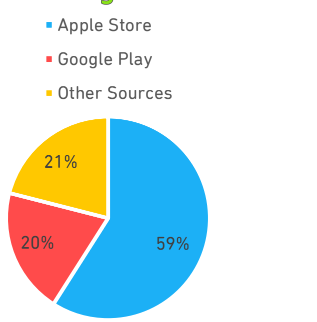
Source: DUOL Investor Center

Exhibit 24: Forecasted YoY Growth



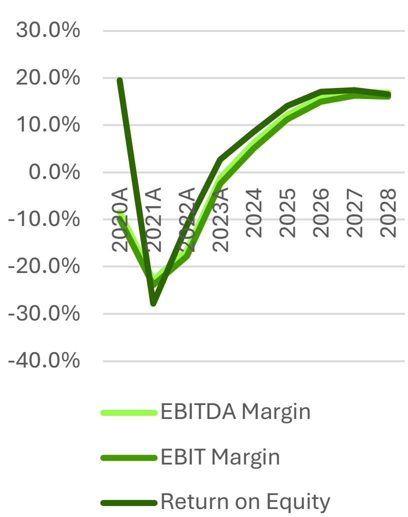
Source: Team Analysis

Exhibit 25: Payment Processors



Source: Bloomberg

Exhibit 26: Margin Growth



Source: Bloomberg

FINANCIAL ANALYSIS

Revenue

Subscriptions growing despite lagging profitability: DUOL has four primary sources of income, their largest being subscriptions. DUOL has seen an increase of over 44% in revenue in 2023 and a steady increase of over 45% yearly from 2021 (Exhibit 22). They have made over $400 million in revenue from subscriptions, which are broken into two tiers: Duolingo Super and Duolingo Max.

This accounts for 76% of overall revenue. There are 6.6 million subscribers at the end of 2023, with 88 million monthly users, representing an 8.3% Subscriber Penetration, growing 6.4% from the previous year (Exhibit 24). Currently, Average Revenue Per (Monthly Active) User (ARPU) is stagnating since 2022 with approximately $1.72 per MAU since 2022 (Exhibit 17). Daily Active Users (DAU) ARPU has seen a negative trend since Q1 of 2022, decreasing from a high of approx. $7 down to near $5, that's a 29% decrease in ARPU over nearly 3 years (Exhibit 23).

These devasting trends in DUOL's main revenue source, subscriptions, are expected to be partially mitigated by DUOL MAX which will offer an AI chatbot at nearly double the subscription cost of DUOL SUPER. Other sources of revenue include their English learning test, which produced $41 million, and other in-app purchases, which produced $34 million, and advertisements producing $49 million in 2023.

Advertising set to expand revenue diversity: The second source of revenue is from advertising. For the users who are not subscribers, the user experience is blended with ads that have brought in $49 million in revenue in 2023. More ad revenue is produced as DUOL more users. It has been found that lesser developed nations tend to generate more advertising revenue versus subscription revenue as they are less likely to purchase the subscription for convenience reasons. However, to maintain profitability DUOL largely relies on the conversion of free users (ad revenue generating users) into subscription paying users.

Duolingo English Test remains stable: The DET has seen growth at around 26.0% YoY. The test provides a pipeline for foreign English learners to achieve a certificate backed by the reputation of Duolingo that states a proficiency in English. This test is accepted by 5500+ institutions worldwide including top American Ivy League Universities. Although not a primary driver with high expected growth over the future, the English test is a great gateway into influencing the classroom and professional learning environments around the globe while also improving the professional reputation of DUOL.

In-App Purchases signal potential diversification: The growth of this segment speaks to the impact that DUOL's gamification has on users. Growth in 2023 saw a 93.6% YoY increase, which is incredibly interesting as this segment includes streak freezes, extra lives, and other functions that play to the engaging nature of the app. Investors are largely excited to see this segment grow, however, it remains only 6.5% of revenues as of 2023.

Exhibit 27: DuPont Analysis

					Projected				
_	2020A	2021A	2022A	2023A	2024E	2025E	2026E	2027E	2028E
DuPont Analysis									
Gross Margin	72%	72%	73%	73%	72%	70%	68%	64%	60%
EBITDA Margin	-8%	-23%	-17%	-1%	6%	12%	16%	17%	17%
Profit Margin	-10%	-24%	-16%	3%	9%	14%	18%	18%	18%
Asset Turnover	0.9x	0.4x	0.5x	0.6x	0.6x	0.6x	0.6x	0.6x	0.6x
Return on Assets	-9%	-9%	-8%	2%	5%	9%	11%	12%	12%
Financial Leverage	-2.2x	1.3x	1.4x	1.5x	1.4x	1.4x	1.4x	1.3x	1.3x
Return on Equity	20%	-12%	-11%	2%	8%	12%	15%	15%	15%
Return on Invested Capital	-93%	-143%	-132%	-27%	40%	106%	162%	198%	217%
Liquidity									
Current Ratio	2.5x	2.5x	2.5x	2.5x	2.5x	2.5x	2.5x	2.5x	2.5x
Quick Ratio	2.4x	5.2x	3.8x	3.2x	3.4x	3.5x	3.8x	4.2x	4.6x
Debt Ratios									
Interest Coverage Ratio	-69.0x	-3156x	-9.1x	-0.4x	1.0x	2.4x	3.3x	3.9x	4.1x
Net Debt/EBITDA Adjusted	3.4x	7.1x	6.6x	72.2x	-13.1x	-6.8x	-5.5x	-5.5x	-5.8x

Source: Bloomberg

Exhibit 28: Reverse DCF

IMPLIED DCF VALUATION	
PV OF FCFF	$1,805
LT GROWTH RATE	5.0%
FINAL YEAR FCF	$1,105
TV IN FINAL YEAR	$20,517
PV OF TV	$13,153
TEV	**$14,959**
LESS: NET DEBT	--
EQUITY VALUE	**$14,959**

Share Price Calculation	
SHARES OUT (mm)	43
IMPLIED SHARE $	$351.13
CURRENT SHARE $	$351.13
IMPLIED GROWTH %	62.0%

Source: Team Analysis

Exhibit 29: Beneish M-Score

KEY RATIOS	Index
DSRI	1.32
GMI	1.00
AQI	1.00
SGI	1.44
DEPI	0.73
SGAI	0.83
LVGI	1.14
TATA	-0.14
M SCORE	-2.514

Source: Team Analysis

Exhibit 30: WACC Calculation Methodology

Risk-Free Rate	4.14%
Market Risk Premium	6.0%
Beta	1.04
Cost of Equity	10.38%
Avg. Book Value of Debt	$42.8M
Cost of Debt	0%
WACC	10.38%

Source: Team Analysis

Dupont remains healthy: With factors like slowing subscriber retention and revenue drivers, we can see this effect on multiple financial metrics when analyzing a DuPont. We predict that DUOL's EBITDA margin will see little improvement YoY, reaching 17% by 2028 (Exhibit 27). Gross Margin is expected to compress as we predict COGS to accelerate due to an increase in queries from DUOL MAX and discounted subscription revenues from less developed nations. They are adequately able to meet any debt coverage as their subscription model allows for recurring and consistent cashflows, they also maintain a lot of cash on hand while employing little leverage. DUOL's ROE is expected to be 15% by 2028, more than 7x that of 2023's ROE (Exhibit 26). Their lack of operational leverage and secure capital structure leaves little credit risk, allowing DUOL to fully focus on operational viability.

Expenses

Gross Profit Margin projected to stay relatively unchanged: DUOL's Cost of Revenues is dominated by Apple Store Revenue taking a commission of 15-30% on all revenues and making up about 59% of processing for DUOL mobile revenues (Exhibit 25). The rest is 20% Google Play and 21% represents other sources of payment processors. This presents a risk to DUOL as they pay a significant margin to these processors, ultimately damaging their ability to reinvest into the company and grow earnings. As of 2023, Cost of Revenues grew 42.9% YoY, thus we project that by 2028 this figure will gently moderate to 39.8% YoY due to an inability for DUOL to shed this expense as Revenues grow at a similar rate.

Operating Expense growth set to slow: Total operating expenses as of 2023 grew 20% YoY, this figure is expected to continue growing but less so every year. We project a % growth rate of 16% YoY in 2028 citing heightened R&D expense continuing as DUOL prioritizes constantly updating product offerings and innovating their Intellectual Property. In DUOL's drive to continue innovating they are expected to further gamify their app which requires immense data research and optimization. As DUOL continues to grow we expect that management will reduce SG&A growth.

VALUATION

REVERSE DCF… REVERSING ANALYST EXPECTATIONS

The Reverse DCF: analysis reveals that Duolingo's current market valuation is based on highly unrealistic growth assumptions, making a compelling case for selling the stock. To justify its valuation, Duolingo's revenue would need to grow at an extraordinary 62.0% CAGR over the next five years, far surpassing both historical trends and industry norms (Exhibit 28). These projections also imply substantial improvements in free cash flow (FCF) margins, which would require drastic cost reductions or unprecedented monetization gains—difficult to achieve in a competitive market with rising user acquisition costs and retention challenges. Additionally, the valuation assumes continuous and rapid user growth with minimal attrition, failing to account for market saturation risks, retention difficulties, and scalability limitations. This significant gap between market expectations and achievable financial performance suggests that Duolingo's stock is overpriced. A sharp correction is likely if the company fails to deliver to these overly ambitious targets, making it prudent for investors to consider selling to avoid potential losses when the market adjusts to more realistic expectations.

M-SCORE SIGNALING MANIPULATION

An M-score: detects the likelihood of earnings manipulation by analyzing financial statement metrics and identifying deviations from expected patterns. Duolingo's high M-Score, suggesting potential earnings manipulation, is supported by financial trends in key metrics. The Days Sales in Receivables Index (DSRI) highlights a significant rise in accounts receivable (AR), increasing from $46.7M in 2022 to $89.0M in 2023, which may indicate revenue inflation through accelerated sales recognition. The Asset Quality Index (AQI) reflects a shift in asset composition, with current assets growing from $697.2M to $897.8M while property, plant, and equipment (PP&E) declined. Duolingo's net income also surged to $16.1M in 2023 from a -$59.6M loss in 2022, raising concerns about the sustainability of this turnaround. Combined with elevated SG&A expenses ($402.3M in 2023) and increasing financial leverage, these trends amplify the risk of overstated performance (Exhibit 29). These red flags, alongside the M-Score results, suggest that Duolingo's financial stability may be weaker than reported, posing significant risks for investors.

WACC, more like WACK

Cost of Debt: There are three ways to assess Duolingo's cost of debt: credit spreads, the weighted average interest rate on outstanding debt, and the rate used to calculate the present value of hybrid instruments. However, comparing against peers is not possible because Duolingo has no credit rating, and its reported interest expense is essentially zero. This leads the cost of debt to be zero in this instance.

Cost of Equity: We used the Capital Asset Pricing Model (CAPM) to calculate the cost of equity for Duolingo. The figures involved in the CAPM formula involve using Beta, Market Risk Premium, and a Risk-Free Rate (10 Year US Treasury). We used a Beta of 1.04 to reflect the volatility of the stock compared to the market. We used a 6% premium to reflect the long-term average of equity returns over the risk-free rate. When calculated, we get Duolingo's cost of equity to be 10.38% (Exhibit 30).

WACC: The WACC is estimated as the cost of Duolingo equity financing based on a cost of equity of 10.38%. The reason for this is since the cost of debt of 0%, and the company is entirely financed by equity, the debt side of the WACC cancels out, leaving us with the cost of equity as our WACC.

Figure 31: Valuation Metrix

Method	Weight	Price
DCF	60%	$ 306.34
Rel Val	40%	$ 255.00
Target Price		$ 285.80
Premium		-18.6%

*As of close Jan 10, 2025

Source: Team Analysis

Exhibit 32: Scenario Analysis

Bear	Base	Bull
DUOL is a momentum stock faced with high valuations and projections while technology, demographics, and competition remain key headwinds. Language learning may become less demanded given real-time language translation. DUOL is spending heavily in R&D to create a first mover advantage, however their utilization of OpenAI is non-propreitary. Expected diminshment as virality fades and revenue per user slows due to reliance on Less Devoleped Country (LDC) growth.	DUOL maintains its position as the leading language solution, capitalizing off first-class brand and gamification. AI and future developments remain key growth drivers as DUOL grows increasingly through their ability to keep users engaged. They continue to benefit from lifetime users as demographics age and lifelong learning becomes a priority. Schools and institutions continue to partner and respect DUOL's ability to educate users in a fun and beneficial way, paving themselves as a sustainable and ethical company, thus continuing organic growth.	DUOL's education advancements are adopted worldwide as they expand learning beyond language, and gamification becomes a key learning demand. Their product offering expands from an app interface and into high margin software learning solutions that encapsulate all demographics of the language learning and general education market. Their ability to convert subscribers grows increadibly as users begin self-actualizing through the benefits that DUOL has in making learning fun. Their moat expands and outcompetes users across language learning and traditional education markets.

Source: Team Analysis

Alternative Scenarios, Bull Case Priced-In:

The Bear & Bull: case reflect a potential deviation from management's guidance and expectations in the long term. DUOL may face a variety of headwinds and tailwinds as they position themselves within a rapidly changing environment. In short, we view the Bull case as DUOL dominating the language learning space while maintaining strong growth in non-language learning segments like math and music, and for a variety of demographics like professional and casual. The Bear case however views DUOL as a trend with little longevity as their market position is eaten away by competitors and technological advancement. DUOL is likely a mix of both scenarios despite being priced for near perfection (Exhibit 32).

Exhibit 33: Competitor Analysis

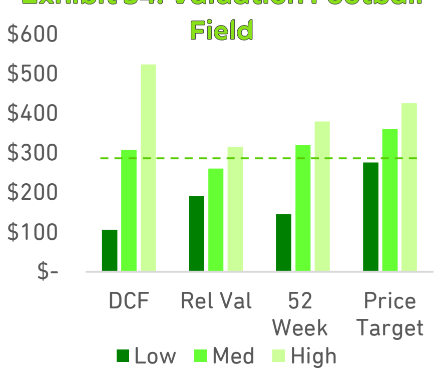
TICKER	COMPANY NAME	PRICE	MARKET CAP	EV	REVENUE MULTIPLE 2023	REVENUE MULTIPLE 2024	REVENUE MULTIPLE 2025	EBITDA MULTIPLE 2023	EBITDA MULTIPLE 2024	EBITDA MULTIPLE 2025	REVENUE GROWTH (Y/Y) 2023	REVENUE GROWTH (Y/Y) 2024	REVENUE GROWTH (Y/Y) 2025	FCF to EBITDA 2023	FCF to EBITDA 2024	FCF to EBITDA 2025
DUOL	DUOLINGO INC.	$351.13	$14,971.9	$14,145.8	26.6x	19.0x	14.7x	10923.4x	74.6x	52.0x	44%	40%	29%	108.1x	1.3x	1.2x
COUR	COURSERA INC	$8.51	$1,327.4	$611.7	1.0x	0.9x	0.8x	-5.1x	16.4x	11.2x	21%	9%	7%	-0.1x	1.2x	1.1x
CHGG	CHEGG INC	$1.48	$167.9	$432.0	0.6x	0.7x	0.8x	7.0x	3.0x	3.3x	-7%	-14%	-16%	2.6x	0.4x	0.4x
UDMY	UDEMY INC	$8.45	$1,164.3	$855.6	1.2x	1.1x	1.1x	-9.4x	24.4x	12.2x	16%	7%	3%	0.2x	0.8x	1.5x
SPOT	SPOTIFY INC	$485.53	$92,701.1	$88,475.1	6.7x	5.7x	4.9x	-307.2x	59.3x	37.3x	13%	18%	15%	-2.3x	1.3x	1.2x

Source: Bloomberg

COMPETITIVE COMPS

With a market valuation: of $14.9 billion and an enterprise value (EV) of $14.1 billion, Duolingo (DUOL) dominates the education technology sector and outperforms its immediate rivals. Its high revenue multiples of 26.6x in 2023 and 14.7x by 2025, pose questions about sustainability because they are insufficient to support its slowing growth trajectory. In comparison, Coursera (COUR), Chegg (CHGG), and Udemy (UDMY) exhibit higher multiples, signaling inflated pricing across the edtech sector, while Spotify's more modest revenue multiples underscore its diversification advantage (Exhibit 33). DUOL's EBITDA multiples reveal substantial profitability challenges, with extreme volatility from 10,923.4x in 2023 to 52.0x in 2025, reflecting its reliance on aggressive user acquisition. The long-term outlook of DUOL is weakened by its slowdown amid growing competition and market saturation, even though it outperforms peers in year-over-year revenue growth, with rates of 44% in 2023 falling to 29% in 2025. In addition, DUOL's free cash flow (FCF) to EBITDA ratio dropped significantly from 108.1x in 2023 to 1.2x in 2025, suggesting that the company may have cash flow issues as it grows. Strategically, DUOL is at a disadvantage to more evenly matched rivals like Spotify because of its insufficient diversification and dependence on premium valuation criteria, which expose operational risks. Given its growth potential and substantial dangers, these facts imply that DUOL's present value is excessively optimistic and that investors should exercise caution.

Exhibit 34: Valuation Football Field

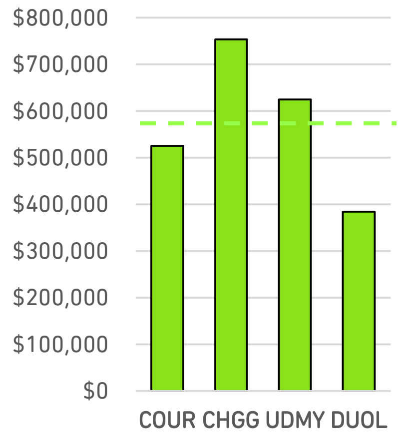


Source: Team Analysis

DCF, VALUATION AT DISCOUNT

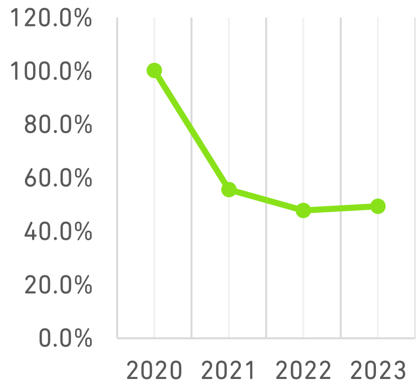
Base case DCF projections highlight a $306.34 price target: supported by a high growth rate decrease over time (Exhibit 34 & 31). Main revenue drivers include Subscriber Penetration, MAU Growth, and Revenue per Subscriber. Key expense drivers include Operating Expense Deflation and Cost of Revenues Deflation. We expect these main expenses to deflate heavily in the near term as DUOL's operations are reflecting a decrease growth rate YoY. Revenue Growth is also set to grow considerably, however at a rate reflecting an overtime disinflation of their growth rate, signaling an approach to maturity.

Exhibit 35: Avg. 3-Yr Revenues



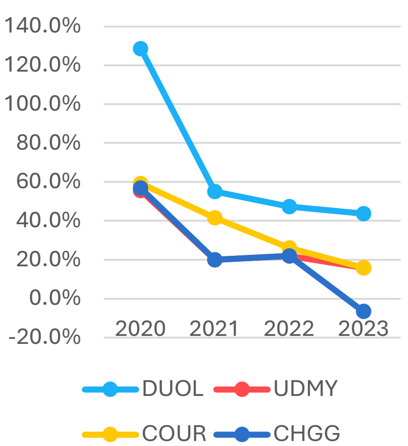
Source: Bloomberg

Exhibit 36: YoY Sub. Bookings.



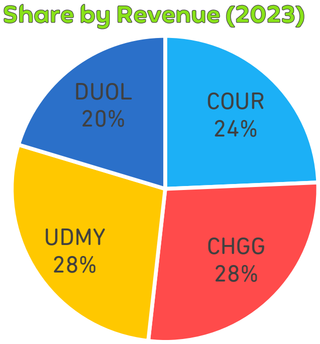
Source: Bloomberg

Exhibit 37: Rev. Growth YoY



Source: Bloomberg

Exhibit 38: Ed Tech Market Share by Revenue (2023)



Source: Bloomberg

Risk of Limited Leverage

Duolingo's debt-free capital structure: offers both advantages and disadvantages. While the company benefits from avoiding interest costs and financial risks connected with debt, its conservative stance may limit its capacity to scale operations quickly. Duolingo is facing increased competition from developing language learning platforms such as Speak and other AI-powered alternatives that provide more complex and professional learning experiences. Without access to debt finance, Duolingo may struggle to invest significantly in marketing, research, and development to preserve its competitive advantage.

Subscription focus: Duolingo's revenue sources are primarily reliant on its subscription-based strategy, with major contributions from products such as Duolingo Super and Duolingo Max. The company's development into new markets, particularly in less developed countries, may necessitate significant investments in infrastructure, localization, and client acquisition. A lack of leverage may limit Duolingo's ability to allocate cash efficiently to these projects, thereby delaying global expansion and lowering profitability. Duolingo's dependence on organic growth tactics and viral marketing campaigns is also worth considering. While these efforts have helped to attract users, they may not be enough to support long-term development without more investment in paid marketing channels and partnerships. Competitors with debt finance may be able to aggressively increase their market presence, leaving Duolingo vulnerable to losing market share in crucial demographics. Duolingo has been able to preserve its financial flexibility by taking a careful approach to finance. Its capacity to scale operations and maintain long-term growth in a market that is becoming more and more saturated may be hampered by its lack of leverage.

INVESTMENT RISKS

WHERE WE COULD BE WRONG

Risk 1: DUOL may be able to hold onto existing and add new users

To improve user retention, Duolingo should prioritize ongoing product innovation. Examples include tailored learning paths, interesting gamification features, and regular updates based on user input. The company's daily active users (DAUs) have increased by 54% year over year, proving the value of gamified features. Duolingo has established itself as a leader in AI-driven language learning solutions with the launch of "Duolingo Max," which is powered by OpenAI's GPT-4 and further improves tailored learning experiences.

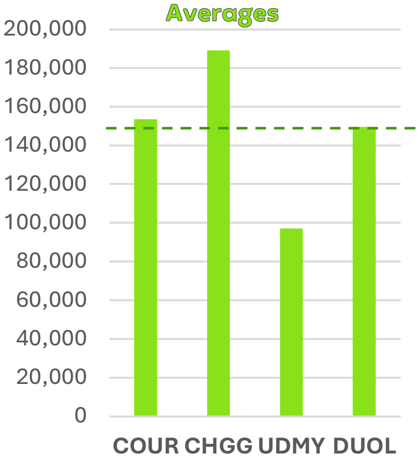
Mitigant: Duolingo's business success depends on maintaining and expanding its user base, increasing engagement, and converting users into paying members who continue with the site. Duolingo announced 6.6 million paying subscribers and 26.9 million daily active users (DAUs) as of December 31, 2023. Failure to increase these figures could have a negative impact on Duolingo's bottom line. Duolingo made $622 million in total bookings in the fiscal year that ended on December 31, 2023, of which over 79% came from subscription services. Duolingo's competitors like Spotify and Coursera publicly disclose their churn rates which allows investors to understand the sustainability of revenues. However, DUOL does not disclose churn rates which makes it difficult to have confidence in their financial strength and projections. Thus, investors must piece together operational trends despite slowing growth in many metrics such as revenue growth and Subscriber Bookings (Exhibit 36 & 37)

Risk 2: Highly Competitive Industry, but DUOL is Leading

To reduce competitive pressures, Duolingo can widen its portfolio by offering tailored courses, and specialized learning pathways to attract career-minded individuals. Duolingo's daily active users (DAUs) increased by 54% in 2023 compared to the previous year, demonstrating high user engagement with its current features. Additionally, the business saw a 57.1% rise in paid members, proving the success of its monetization tactics. However, competitors such as Udemy, which saw a 15.8% year-over-year revenue increase of $728 million, and Coursera, which had total net revenues of $635 million in 2023, illustrate the growing need for specialized and professional development courses (Exhibit 38). Increased enrollment in AI-related courses, which reflected the market's need for cutting-edge capabilities, was the primary driver of Coursera's revenue growth.

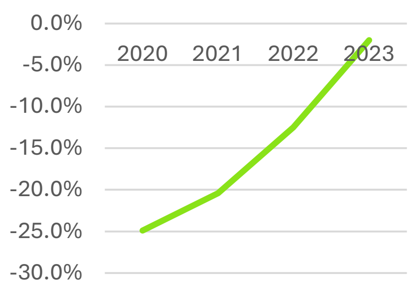
Despite a sales reduction to $716 million in 2023, Chegg continues to produce substantial revenue from its subscription offerings. Forming partnerships with businesses and educational organizations can increase Duolingo's legitimacy and draw in more users. While adding more individualized and flexible learning tools, Duolingo should keep using its gamified learning approach. Companies such as Udemy, Chegg, and Coursera also continue to invest in innovation as AI offerings become a new educational standard. In 2023, Udemy's revenue increased by 15.8% year over year to $728 million, bolstered by over 200,000 courses taught by 70,000 teachers. These results were also influenced by AI-powered features that improve learning outcomes. Despite making $640 million from subscription services, Chegg reported a drop in overall net revenues to $716 million in 2023, underscoring the need for additional innovation (Exhibit 38). With almost two million students enrolled in generative AI courses, Coursera's overall net sales increased to $635 million in 2023. These examples demonstrate that ongoing investment in AI integration, gamification, and personalized learning may greatly enhance user engagement and financial performance, preparing organizations for long-term success.

Exhibit 39: R&D Expense 3yr Averages



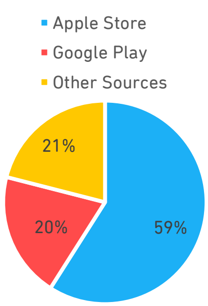
Source: DUOL Investor Center

Exhibit 40: ROIC



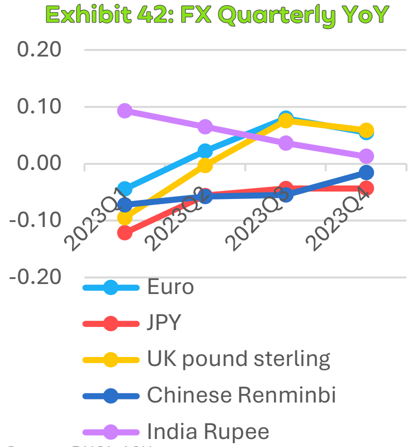
Source: DUOL Investor Center

Exhibit 41: Payment Processors



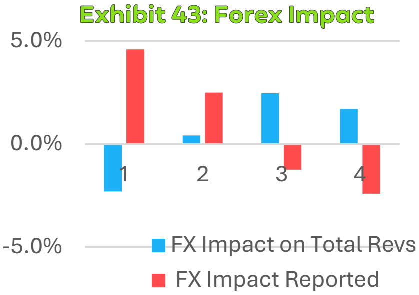
Source: DUOL 10K

Exhibit 42: FX Quarterly YoY



Source: DUOL 10K

Exhibit 43: Forex Impact



Source: DUOL 10k

Mitigant: The online language learning sector is highly competitive, with minimal entry barriers, a steady influx of new products, and a variety of business models vying for learners' time and money. Competitors such as Coursera or Udemy may offer unique or less expensive products that appeal to shifting consumer preferences. Duolingo does own a majority market share among its competitors with a market cap of $15 billion dollars. However, Duolingo may only cater to casual learners, due to the highly gamified experience provided by Duolingo. Udemy and Coursera have a more professional environment which may appeal to a more mature audience. Chegg also requires a user to subscribe to their site to use their learning services. Duolingo's user base and engagement levels may drop if they are unable to effectively compete, which would force them to cut pricing or boost spending to draw customers.

Risk 3: AI Outpacing Industry and Competitor Products

Duolingo's increased research and development, and sales and marketing spending are inextricably intertwined, as R&D produces innovations that feed effective marketing. The substantial investment in AI and new technologies that resulted in products like Adventures, a gamified language-learning experience, and partnerships like the Loog partnership for music education caused Duolingo's spending on research and development to increase by 95.8% between FY20 and FY21 (Exhibit 39). At the same time sales and marketing expenses increased by 69.1%. These improvements were promoted to draw users and increase market share. Through data-driven targeting and customized messaging, Duolingo's AI innovations not only improve its services but also increase the effectiveness of its advertising. By ensuring that Duolingo's innovations are successful in the market, this synergy helps the company keep its competitive edge in the AI-driven learning sector.

Mitigant: As AI technology constantly improves, Duolingo risks falling behind if it does not continue to integrate modern artificial intelligence advancements into its platform. In FY23, we have seen YoY growth of these expenditures decrease to 13.2% for sales and marketing, and 29.2% for R&D. Competitors may use artificial intelligence to create more sophisticated, adaptive learning aids, providing a more personalized and efficient learning experience. Duolingo may lose its competitive edge and see a decline in user engagement, retention, and market share if it doesn't continue to lead the way in AI innovation.

Risk 4: Dependence on Third-Party Platforms

Duolingo generates a substantial portion of its revenue through mobile app stores. This reliance allows Duolingo to benefit from the massive global reach and infrastructure provided by these platforms, ensuring accessibility to millions of potential users worldwide. The app stores' well-established user bases and payment systems offer a seamless experience for Duolingo's subscribers, reducing operational complexities and enhancing customer satisfaction. Furthermore, the platform's visibility on these stores helps maintain steady organic growth and enables strategic marketing initiatives to attract new users efficiently. Although they also rely on app stores, competitors like Coursera and Udemy have expanded their sources of income through institutional and direct business relationships. While Udemy made $728 million in 2023 thanks to its large course library and direct corporate relationships, Coursera recorded $635 million in sales, with a sizable amount coming from enterprise clients.

Mitigant: Mobile app shops account for a significant amount of Duolingo's revenue; the Apple App Store and Google Play Store account for 79% of total revenue (Exhibit 41). Duolingo's financial success might be greatly impacted by any modifications to platform policies or commission fees, which currently range from 15% to 30%. A decrease in search engine visibility on these platforms could result in fewer organic downloads and greater customer acquisition expenditures, thereby affecting profitability and growth forecasts. Furthermore, regulatory actions or disputes with these distribution partners could further threaten access to key revenue streams, emphasizing the need for a diversified revenue strategy.

Risk 5: Foreign Exchange Rate Fluctuations

Currency fluctuations provide an opportunity to profit from favorable exchange rates and increase revenue possibilities in emerging countries. Due to its proactive financial management, Duolingo was able to successfully manage changes in exchange rates in 2023. Because of its diverse global footprint, the corporation is less reliant on any one currency and is more resilient to regional economic downturns (Exhibit 42). Furthermore, Duolingo's emphasis on hedging measures and operational flexibility positions it well to capitalize on currency fluctuations in a way that maximizes profitability and boosts its long-term financial picture. In contrast, Chegg reported $716 million in sales from its overseas operations in 2023, which represented a smaller portion of total revenue.

Mitigant: Foreign exchange rate swings pose a substantial risk to Duolingo, as international markets contribute nearly half of its revenue. In 2023, major currencies experienced significant fluctuations: the Euro and Indian Rupee appreciated in some quarters, while the Japanese Yen, UK Pound Sterling, and Chinese Renminbi faced depreciation. The foreign exchange impact on revenue was notable, ranging from -4.6% to -2.5% across quarters (Exhibit 43). This stresses the need for Duolingo to manage foreign exchange rate risks carefully.

APPENDICES

APPENDIX 1: GLOSSARY

Acronym	Definition	Acronym	Definition
AI	Artificial Intelligence	MAU	Monthly Active User
API	Application Programming Interface	NEO	Named Executive Officer
ARPU	Average Revenue Per User	NGO	Non-Government Organization
CAC	Customer Acquisition Cost	OPEX	Operating Expenditures
CAGR	Compounded Annual Growth Rate	R&D	Research & Development
CAPM	Capital Asset Pricing Model	REV	Revenue
DAU	Daily Active Users	ROE	Return on Equity
DCF	Discounted Cashflow Analysis	ROIC	Return on Invested Capital
DET	Duolingo English Test	RSU	Restricted Stock Unit
EBITDA	Earnings Before Interest Depreciation & Amortization	SG&A	Selling General & Administrative
EV	Enterprise Value	SUB	Subscriber
FCF	Free Cash Flow	TAM	Total Addressable Market
FX	Foreign Exchange	WACC	Weighted Average Costo of Capital
IPO	Initial Public Offering	YoY	Year over Year

APPENDIX 2: INCOME STATEMENT

Duolingo, Inc.
Income Statement

($ Thousands)

					Projected				
	2020A	2021A	2022A	2023A	2024	2025	2026	2027	2028
Revenue									
Gross Revenue	161,696.0	250,772.0	369,495.0	531,109.0	712,025.97	940,962.3	1,215,753.3	1,530,470.6	1,896,075.5
Cost of Revenues	45,987.0	69,186.0	99,431.0	142,105.0	201,264.2	282,538.2	393,779.8	545,718.7	752,071.6
Gross Profit	**115,709.0**	**181,586.0**	**270,064.0**	**389,004.0**	**510,761.7**	**658,424.0**	**821,973.6**	**984,751.8**	**1,144,003.9**
Operating Expenses									
Research & Dev	53,024	103,833	150,444	194,352	229,310.4	267,257.2	309,272.1	355,461.1	405,893.9
Sales & Mkt	34,983	59,170	66,967	75,788	89,420.1	104,217.5	120,601.3	138,612.8	158,279.2
Gen & Admin	43,713	78,590	117,848	132,123	155,888.2	181,684.9	210,247.2	241,647.0	275,931.9
Total Operating Expenses	**131,720.0**	**241,593.0**	**335,259.0**	**402,263.0**	**474,618.7**	**553,159.6**	**640,120.6**	**735,721.0**	**840,105.1**
		83.41%	**38.77%**	**19.99%**	**17.99%**	**16.55%**	**15.72%**	**14.93%**	**14.19%**
Operating Income	**(16,011.0)**	**(60,007.0)**	**(65,195.0)**	**(13,259.0)**	**36,143.0**	**105,264.5**	**181,853.0**	**249,030.9**	**303,898.7**
Other Income	72.0	30.0	(676.0)	(55.0)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
EBITDA	**(13,683.0)**	**(57,251.0)**	**(61,001.0)**	**(6,219.0)**	**44,545.0**	**115,332.6**	**193,587.2**	**262,431.2**	**318,965.1**
Depreciation & Amortizat	2,256	2,726	4,870	7,095	8,402	10,068	11,734	13,400	15,066
EBIT	**(15,939.0)**	**(59,977.0)**	**(65,871.0)**	**(13,314.0)**	**36,143.0**	**105,264.5**	**181,853.0**	**249,030.9**	**303,898.7**
Interest Income (Expense	231.0	19.0	7,235.0	31,091.0	34,593.0	44,572.6	54,552.2	64,531.8	74,511.4
EBT	(15,708.0)	(59,958.0)	(58,636.0)	17,777.0	70,736.0	149,837.1	236,405.2	313,562.7	378,410.1
Provision (benefit) for inc	68.0	177.0	938.0	1,710.0	7,073.6	14,983.7	23,640.5	31,356.3	37,841.0
Total Income Taxes	68.0	177.0	938.0	1,710.0	7,073.6	14,983.7	23,640.5	31,356.3	37,841.0
Net Income	**($15,776.0)**	**($60,135.0)**	**($59,574.0)**	**$16,067.0**	**$63,662.4**	**$134,853.3**	**$212,764.7**	**$282,206.4**	**$340,569.1**

APPENDIX 3: BALANCE SHEET

Duolingo, Inc.
Balance Sheet

($ Thousands)

					Projected				
	2020A	2021A	2022A	2023A	2024	2025	2026	2027	2028
ASSETS									
Current Assets									
Cash and cash equivalent	120,490.0	553,922.0	608,180.0	747,610.0	947,856.5	1,222,303.9	1,580,517.4	2,014,140.8	2,512,211.7
Accounts receivable	20,450.0	33,163.0	46,728.0	88,975.0	102,114.0	124,028.0	145,942.0	167,856.0	189,770.0
Deferred cost of revenues	13,585.0	24,219.0	35,041.0	53,931.0	64,659.0	77,845.0	91,031.0	104,217.0	117,403.0
Prepaid expenses and oth	3,855.0	7,967.0	7,234.0	7,282.0	8,971.5	9,926.3	10,881.1	11,835.9	12,790.7
Total current assets	158,380.0	619,271.0	697,183.0	897,798.0	1,123,601.0	1,434,103.2	1,828,371.5	2,298,049.7	2,832,175.4
Operating lease right-of-u	8,073.0	28,369.0	22,508.0	19,103.0	26,320.5	29,043.4	31,766.3	34,489.2	37,212.1
Intangible assets, net	2,296.0	4,566.0	8,497.0	15,995.0	19,095.5	23,598.3	28,101.1	32,603.9	37,106.7
Property and equipment,	6,428.0	8,211.0	12,969.0	11,792.0	15,062.5	17,147.5	19,232.5	21,317.5	23,402.5
Goodwill	-	-	4,050.0	4,050.0	6,075.0	7,695.0	9,315.0	10,935.0	12,555.0
Restricted cash	-	-	-	2,735.0	2,735.0	3,555.5	4,376.0	5,196.5	6,017.0
Deferred tax assets, net	-	-	633.0	766.0	1,082.5	1,375.6	1,668.7	1,961.8	2,254.9
Other assets	562.0	894.0	1,507.0	1,718.0	2,190.5	2,598.6	3,006.7	3,414.8	3,822.9
Total assets	175,739.0	661,311.0	747,347.0	953,957.0	1,196,162.5	1,519,117.1	1,925,837.8	2,407,968.4	2,954,546.5
LIABILITIES AND EQUITY									
Current Liabilities									
Deferred revenues	54,792.0	98,267.0	157,550.0	249,192.0	300,571.0	364,819.3	429,067.6	493,315.9	557,564.2
Accounts payable	2,196.0	7,818.0	1,177.0	2,447.0	1,937.5	1,348.7	759.9	171.1	(417.7)
Income tax payable	68.0	113.0	1,069.0	792.0	1,292.5	1,605.3	1,918.1	2,230.9	2,543.7
Accrued expenses & othe	8,634.0	12,933.0	21,970.0	24,931.0	31,599.0	37,391.8	43,184.6	48,977.4	54,770.2
Total current liabilities	65,690.0	119,131.0	181,766.0	277,362.0	335,400.0	405,165.1	474,930.2	544,695.3	614,460.4
Long-term obligation und	8,131.0	29,124.0	23,503.0	21,094.0	28,780.0	32,106.8	35,433.6	38,760.4	42,087.2
Total liabilities	73,821.0	148,255.0	205,269.0	298,456.0	364,180.0	437,271.9	510,363.8	583,455.7	656,547.6
Convertible preferred sto	182,609.0	-	-	-	-	-	-	-	-
Stockholders' equity									
Total stockholders' equity -	80,691.0	513,056.0	542,078.0	655,501.0	831,982.5	1,081,845.2	1,415,474.0	1,824,512.7	2,297,998.9
Total Liabilities and Equity	**175,739.0**	**661,311.0**	**747,347.0**	**953,957.0**	**1,196,162.5**	**1,519,117.1**	**1,925,837.8**	**2,407,968.4**	**2,954,546.5**

APPENDIX 4: DRIVER SCENARIOS

	EXPENSE SCENARIOS					
	Operating Expense Deflation	**-10.00%**	**-8.00%**	**-5.00%**	**-5.00%**	**-5.00%**
	Base Case	-10.00%	-8.00%	-5.00%	-5.00%	-5.00%
(2%)	Best Case	-12.00%	-10.00%	-7.00%	-7.00%	-7.00%
2%	Worst Case	-8.00%	-6.00%	-3.00%	-3.00%	-3.00%
	Cost of Revenues Deflation	**-3.00%**	**-3.00%**	**-2.50%**	**-2.00%**	**-2.00%**
	Base Case	-3.00%	-3.00%	-2.50%	-2.00%	-2.00%
(1%)	Best Case:	-4.00%	-4.00%	-3.50%	-3.00%	-3.00%
1%	Worst Case:	-2.00%	-2.00%	-1.50%	-1.00%	-1.00%
	Effective Tax Rate	**10.00%**	**12.00%**	**14.00%**	**16.00%**	**18.00%**
	Base Case	10.00%	12.00%	14.00%	16.00%	18.00%
(1%)	Best Case:	9.00%	11.00%	13.00%	15.00%	17.00%
1%	Worst Case:	11.00%	13.00%	15.00%	17.00%	19.00%
	SALES SCENARIOS					
	Subscriber Penetration	**5.00%**	**4.00%**	**3.00%**	**3.00%**	**3.00%**
	Base Case	5%	4%	3%	3%	3%
1%	Best Case:	6%	5%	4%	4%	4%
(1%)	Worst Case:	4%	3%	2%	2%	2%
	Monthly Active Users Growth	**33.00%**	**31.00%**	**28.00%**	**26.00%**	**24.00%**
	Base Case	33.0%	31.0%	28.0%	26.0%	24.0%
1%	Best Case:	34%	32%	29%	27%	25%
(1%)	Worst Case:	32%	30%	27%	25%	23%
	Revenue Per Paid Subcriber	**-4.00%**	**-3.00%**	**-2.00%**	**-3.00%**	**-3.00%**
	Base Case	-4.0%	-3.0%	-2.0%	-1.0%	-1.0%
1%	Best Case:	-3%	-2%	-1%	0%	0%
(1%)	Worst Case:	-5%	-4%	-3%	-2%	-2%
	ECONOMIC SCENARIOS					
	Inflation Scenario	**3.00%**	**3.00%**	**3.00%**	**3.00%**	**3.00%**

OPEX: As DUOL matures and integrates itself, operating expenses, specifically R&D should deflate overtime. Their main drivers for operating growth are IP and content which will require less spend overtime, especially as they haven't laid out major innovations outside of AI features and expanding courses.

COGS: Cost of revenues should decrease as organic growth given IP moat should scale and reach paid users. We expect Cost per subscriber to decrease subtly each quarter. The Base case is only -5% YoY as we expect user growth in lower income nations as high-income national user bases moderate.

Subscriber Penetration: To remain positive and slowly decrease following current operational trends. Best case shows an +8% over base in the event of AI offerings causing broader interest in innovative subscriptions. While worst case shows a matured company that sees little impact from AI offerings

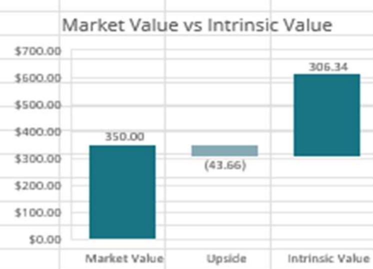
MAU: 35% based on q3 YoY growth. MAU growth at base is expected to continue moderating from its high projected average of 30% YoY to 15% over 5 years. This slowing is commonly seen in comps especially as DUOL marketing, IP, and user reach matures.

Revenue Per Paid Subscriber: is expected to decrease as under-developed nation growth outpaces developed nations.

APPENDIX 5: DCF

DCF Model — CURRENTLY RUNNING: BASE CASE

Assumptions	
Tax Rate	13%
Discount Rate	9%
Perpetural Growth Rate	4.0%
EV/EBITDA Mulltiple	25.0x
Transaction Date	12/30/2023
Fiscal Year End	12/30/2023
Current Price	350.00
Shares Outstanding (k)	43,000
Debt (k)	239,000
Cash (k)	747,600
Capex (k)	13,416



Discounted Cash Flow	**Entry**	**2024**	**2025**	**2026**	**2027**	**2028**	**Exit**
Date	12/30/2023	12/30/2024	12/30/2025	12/30/2026	12/30/2027	12/30/2028	12/30/2028
Time Periods		*0*	*1*	*2*	*3*	*4*	
Year Fraction		*0.50*	*1.50*	*2.50*	*3.50*	*4.50*	
EBIT	(13,314)	36,143	105,264	181,853	249,031	303,899	
Less: Cash Taxes	-	4,699	13,684	23,641	32,374	39,507	
Plus: D&A	$7,095	$8,402	$10,068	$11,734	$13,400	$15,066	
Less: Capex	13,416	14,773	16,656	18,322	19,988	21,654	
Less: Changes in NWC	- 105,019	- 167,765	- 240,737	- 324,503	- 399,913	- 464,361	
Unlevered FCF		192,838	325,729	476,128	609,982	722,165	
(Entry)/Exit	(14,541,400)						11,650,853
Transaction CF	-	96,419	488,594	1,190,319	2,134,938	3,249,741	11,650,853
Transaction CF	(14,541,400)	96,419	488,594	1,190,319	2,134,938	3,249,741	11,650,853

Terminal Value	
Perpetural Growth	15,327,578
EV/EBITDA	7,974,129
Average	11,650,853

Intrinsic Value	
Enterprise Value	12,663,900
Plus: Cash	747,600
Less: Debt	239,000
Equity Value	13,172,500
Equity Value/Share	306.34

Market Value	
Market Cap	15,050,000
Plus: Debt	239,000
Less: Cash	747,600
Enterprise Value	14,541,400
Equity Value/Share	350.00

Rate of Return	
Target Price Upside	-12%
Internal Rate of Return (IRR)	6%

Market Value vs Intrinsic Value	
Market Value	350.00
Upside	(43.66)
Intrinsic Value	306.34

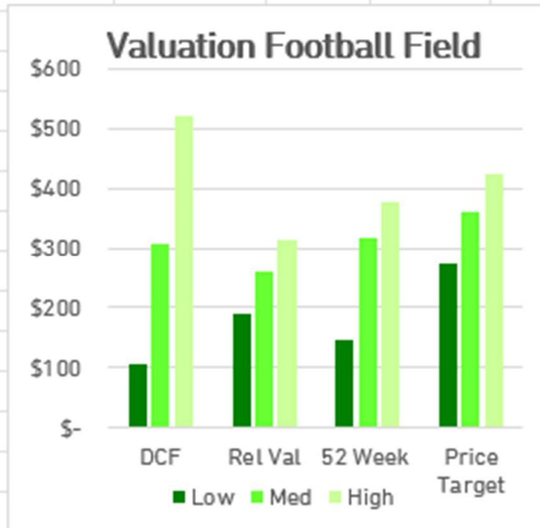
APPENDIX 6: VALUATION FOOTBALL FIELD

	DCF	Rel Val	52 Week	Price Target
Low	$ 105.41	$ 190.00	$ 145.05	$ 275.00
Med	$ 306.34	$ 260.00	$ 318.67	$ 359.00
High	$ 522.36	$ 315.00	$ 378.48	$ 425.00

Med DCF	AVG VAL
$ 306.34	$ 255.00
Weighted Price	
$ 285.80	

Current Share $	318.67

Valuation Metrix		
Method	Weight	Price
DCF	60%	$ 306.34
Rel Val	40%	$ 255.00
Target Price		$ 285.80
Premium		-10%
*As of close Jan 10, 2025		



APPENDIX 7: REVERSE DCF

DUO LINGO REVERSE DCF								
($ IN MILLIONS)			FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
REV			$531	$861	$1,395	$2,260	$3,662	$5,934
% GROWTH RATE	%5 YR CAGR	62.0%		62.0%	62.0%	62.0%	62.0%	62.0%
EBIT			($13)	($22)	($35)	($57)	($92)	($149)
% EBIT MARGIN			(2.5%)	(2.5%)	(2.5%)	(2.5%)	(2.5%)	(2.5%)
LESS: TAXES	% TAX RATE	9.6%	1	2	3	5	9	14
NOPAT			($12)	**($19)**	**($32)**	**($51)**	**($83)**	**($134)**
% NOPAT Margin			(2.3%)	(2.3%)	(2.3%)	(2.3%)	(2.3%)	(2.3%)
PLUS: D&A	% CAPEX	119.9%	7	11	19	30	49	79
CAPEX	% REV	1.1%	(6)	(10)	(16)	(25)	(41)	(66)
CHANGE IN NWC	% REV	19.8%	105	170	276	447	724	1,173
FCFF			**$94**	**$153**	**$247**	**$401**	**$649**	**$1,052**
DISCOUNT FACTOR	% WACC	10.4%		0.5	1.5	2.5	3.5	4.5
PV OF FCFF				**$145**	**$213**	**$313**	**$459**	**$674**

IMPLIED DCF VALUATION	
PV OF FCFF	$1,805
LT GROWTH RATE	5.0%
FINAL YEAR FCF × (1 + g)	$1,105
TV IN FINAL YEAR	$20,517
PV OF TV	$13,153
TEV	**$14,959**
LESS: NET DEBT	--
EQUITY VALUE	**$14,959**

Share Price Calculation	
SHARES OUTSTANDING (mm)	43
IMPLIED SHARE PRICE	$351.97
CURRENT SHARE PRICE	$351.97
IMPLIED GROWTH RATE	**62.0%**

REVERSE DCF: A reverse DCF model calculates Duolingo's implied revenue and free cash flow growth using its current share price of $351.97. Revenue predictions are developed assuming a 62.0% CAGR from FY2023 to FY2028, considering ongoing profitability issues and predicted negative EBIT margins. The model estimates free cash flow to the firm (FCFF) by accounting for changes in tax rates, capital expenditures (CAPEX), and net working capital (NWC). The total enterprise value (TEV) is calculated using the present value of FCFF and a 10.4% discount rate. Long-term valuation uses a terminal value growth rate of 5.0%, dividing TEV by outstanding shares (net debt adjustments excluded). The major assumption driving this valuation is aggressive revenue growth and consistent operating margin performance, implying that market expectations for Duolingo are strongly reliant on long-term high growth and margin improvements.

APPENDIX 8: BENEISH M-SCORE

($ IN MILLIONS)	FY 2023	FY 2022
REV	$531	$369
COGS	$142	$99
SG&A	$402	$335
DEPRECIATION	$7	$5
NET INCOME	$16	-$60
AR	$89	$47
CURRENT ASSETS	$898	$697
PP&E	$12	$13
LONG TERM INVESTMENTS	$0	$0
TOTAL ASSETS	$954	$747
CURRENT LIABILITIES	$277	$182
TOTAL LONG TERM DEBT	$21	$24
CFO	$154	$54

KEY RATIOS	FY 2023	FY 2022	Index
DAY SALES IN RECEIVABLES INDEX (DSRI)	61.15	46.16	1.32
GROSS MARGIN INDEX (GMI)	0.73	0.73	1.00
ASSET QUALITY INDEX (AQI)	-0.95	-0.95	1.00
SALES GROWTH INDEX (SGI)	$531	$369	1.44
DEPRECIATION INDEX (DEPI)	0.38	0.27	0.73
SELLING GENERAL & ADMIN EXPENSE INDEX (SGAI)	0.76	0.91	0.83
LEVERAGE INDEX (LVGI)	0.31	0.27	1.14
TOTAL ACCRUALS TO TOTAL ASSETS (TATA)	-0.14		-0.14
BENEISH M SCORE			-2.514

INTERPRETATION
> -2.22 COMPANY MAY HAVE MANIPULATED EARNINGS
< -2.22 COMPANY IS NOT LIKELEY TO HAVE MANIPULATED EARNINGS

BENEISH M-SCORE: A forensic accounting tool designed to determine the possibility of Duolingo's profits manipulation in FY2023 and FY2022. The methodology assesses important financial ratios that can identify potential red flags in financial reporting, such as revenue recognition, expense manipulation, and asset quality. Among the ratios considered are the Asset Quality Index (AQI), the Gross Margin Index (GMI), and the Day Sales in Receivables Index (DSRI), may suggest aggressive revenue recognition. A comprehensive picture of the company's financial health is also provided by the addition of the Sales Growth Index (SGI), Depreciation Index (DEPI), Selling General & Administrative Expense Index (SGAI), Leverage Index (LVGI), and Total Accruals to Total Assets (TATA). With a Beneish M-Score of -2.514 for FY2023, which is below the -2.22-mark and shows no discernible warning indications of accounting problems, it is doubtful that Duolingo has falsified results. The company's financials appear to be reasonably transparent and trustworthy based on this score. However, monitoring changes in important ratios over time is critical to ensuring continuous financial integrity and detecting any red flags in the future.

APPENDIX 9: BOARD MEMBERS

Name	Position	Since	Prior Board Exp.	Background
Luis von Ahn	Co-founder, Chief Executive Officer & Board Chairman	Aug-11	Yes	Luis von Ahn led reCAPTCHA before its acquisition by Google and holds degrees from Duke (B.S.) and Carnegie Mellon (Ph.D.).
Amy Bohutinsky	Director	Jun-20	Yes	Amy Bohutinsky previously held leadership roles at Zillow and serves on boards including Zillow. She holds a B.A. in Journalism from Washington & Lee University.
Sara Clemens	Director	Jun-20	Yes	Sara Clemens has held COO roles at Whatnot, Twitch, and Pandora Media. She serves on the boards of Thorn and Karat and holds a B.A. and M.A. (Honors) from the University of Canterbury.
Bing Gordon	Director	Feb-20	Yes	Bing Gordon, Partner at Kleiner Perkins and former EVP at Electronic Arts, serves on the boards of Zynga and Amazon. He holds a B.A. from Yale and an M.B.A. from Stanford.
Severin Hacker	Co-founder, Chief Technology Officer & Board Director	Aug-11	No	Severin Hacker, DUOL's CTO since co-founding it with Luis von Ahn in 2011, holds a B.S. from ETH Zurich and a Ph.D. from Carnegie Mellon.
John Lilly	Director	Dec-21	Yes	John Lilly is a venture partner at Greylock Partners, former Mozilla CEO, and Stanford lecturer. He holds a B.S. and M.S. from Stanford and is a co-inventor on seven U.S. patents.
Gillian Munson	Director	Sep-19	Yes	Gillian Munson is CFO of Vimeo and has held leadership roles at Iora Health, XO Group, and Union Square Ventures. She serves on Phreesia's board and holds a B.A. from Colorado College.
Bonnie Ross	Director	Dec-24	Yes	Bonnie Ross is a 30-year gaming industry veteran, former Microsoft executive, and advocate for diversity in tech. She holds a B.A. from Colorado State University.
Mario Schlosser	Director	Jul-24	Yes	Mario Schlosser, co-founder and CTO of Oscar Health, previously worked at Bridgewater and McKinsey. He holds a computer science degree from the University of Hannover and an MBA from Harvard.
Jim Shelton	Director	Oct-20	No	Jim Shelton is an executive at Blue Meridian Partners and former U.S. Deputy Education Secretary. He holds degrees from Morehouse and Stanford.

BOARD MEMBER: An extensive summary of Duolingo's board of directors is given, which also includes information about each member's roles, tenure, previous board experience, and professional backgrounds. The board comprises a variety of people with a wealth of leadership experience in a range of sectors, such as venture capital, technology, education, and healthcare. Prominent individuals like Luis von Ahn, the CEO and co-founder, who oversaw reCAPTCHA prior to Google's acquisition, contribute extensive knowledge of both academia and technology. Industry veterans Bing Gordon, a well-known venture financier and former Electronic Arts executive, and Amy Bohutinsky, who has extensive experience in corporate leadership at Zillow, are also on the board. Several directors, including Gillian Munson and John Lilly, have previous board experience and insights from their leading positions in venture capital companies and software startups. The combination of directors with and without previous board experience provides a balance between new ideas and seasoned governancence. All things considered, the board's combined experience in corporate governance, technological innovation, and strategic leadership sets Duolingo up for sustained expansion and operational excellence in the edtech industry.

APPENDIX 10: SHAREHOLDER OWNERSHIP

Holders of More than 5%:	Number of Shares Beneficially Owned	Percentage Beneficially Owned	Number of Shares Beneficially Owned	Percentage Beneficially Owned (2)	Percen of Vo Pow
Baillie Gifford & Co (2)	3,593,426	9.7%	0	0%	2.2
The Vanguard Group (3)	3,320,429	9.0%	0	0%	2.1
Durable Capital Partners (4)	3,195,402	8.6%	0	0%	2.0
BlackRock, Inc. (5)	2,523,075	6.8%	0	0%	1.6
Named Executive Officers and Directors:					
Luis von Ahn (6)	0	0%	3,547,231	53.7%	38.
Severin Hacker (7)	72	*	3,558,147	53.5%	38.2
Matt Skaruppa (8)	135,330	*	0	0%	*
Natalie Glance (9)	185,688	*	0	0%	*
Robert Meese (10)	170,189	*	0	0%	*
Stephen Chen (11)	38,430	*	0	0%	*
Amy Bohutinsky (12)	28,237	*	0	0%	*
Sara Clemens (13)	11,664	*	0	0%	*
Bing Gordon (14)	124,124	*	0	0%	*
John Lilly	3,631	*	0	0%	*
Gillian Munson (15)	26,619	*	0	0%	*
Jim Shelton (16)	13,237	*	0	0%	*
Laela Sturdy (17)	43,237	*	0	0%	*
All executive officers and directors as a group (13 persons) (18)	780,458	2.1%	7,105,378	99.9%	77.0

OVERVIEW OF OWNERSHIP: The appendix describes Duolingo's beneficial ownership structure, including the holdings of important shareholders, listed executive officials, and directors. The table distinguishes between Class A and Class B shares, emphasizing ownership percentages and voting rights. A significant portion of Class A shares are owned by important institutional owners, including Baillie Gifford & Co., The Vanguard Group, Durable Capital Partners, and BlackRock. Baillie Gifford has the highest interest, at 9.7%. Co-founders Luis von Ahn and Severin Hacker hold the majority of Class B shares, which have more voting rights. They hold 53.7% and 53.5% of the Class B shares, respectively, giving them significant influence over the company's decision-making with a combined voting power of 77.0%. The largest number of Class A shares among identified executive officers and directors are owned by Natalie Glance and Robert Meese, with smaller shares held by other executives and directors. The concentration of power within the founding team is further supported by the fact that all executive officers and directors own 2.1% of Class A shares and 99.9% of Class B shares. This ownership structure preserves institutional investor confidence while guaranteeing that Duolingo's strategic direction stays closely aligned with the co-founders' vision.

CLASS A & B OWNERSHIP: The beneficial ownership structure of Duolingo is described, along with the allocation of Class A and Class B shares among important institutional investors. The Vanguard Group (9.0%), Durable Capital Partners (8.6%), BlackRock, Inc. (6.8%), and Baillie Gifford & Co. (9.7%) are the top Class A shareholders. Due to the dual-class share structure of Duolingo, these investors own a sizable percentage of Class A shares, but their voting power is restricted.

Co-founders Luis von Ahn and Severin Hacker possess the majority of Class B shares, which give them better voting rights, with 53.7% and 53.5%, respectively. With the founders' combined 77.2% voting power, this translates into substantial influence over business decision-making. A somewhat smaller percentage of Class A shares are owned by the remaining directors and executive officers, with prominent holdings by CEOs like Robert Meese and Natalie Glance.

All things considered, the company's dual-class share structure permits institutional investors to engage in ownership with little influence over governance, while preserving strategic control for the founders. This structure guarantees congruence with long-term strategic goals while offering leadership continuity and stability.

APPENDIX 11: ETHICS SCORE

Companies	Duolingo (DUOL)	Spotify (SPOT)	Udemy (UDMY)	Chegg (CHGG)	Coursera (COUR)
Governance Score	5.99	4.99	7.06	6.33	6.67
Trends	0.25	-0.07	2.02	0.31	0.83
Vs. Peers	ABOVE MEDIAN	BELOW MEDIAN	LEADING	ABOVE MEDIAN	LEADING
Vs. Peers	5.99	4.99	7.06	6.33	6.67
Risk Score	23.8	22.3	--	--	--
Risk Category	Medium	Medium	--	--	--
Avg Pos SDG Impact %	35.29	5.88	44.12	44.12	44.12
Avg Neg SDG Impact %	-26.47	-23.53	-26.47	-26.47	-26.47
Avg Net SDG Impact %	8.82	-17.65	17.65	17.65	17.65
M13 % Women on Board	0.4	0.3	0.7	0.4	0.4

ETHICS SCORE: The appendix presents a comparative governance analysis of Duolingo, Inc. alongside its industry peers, including Spotify, Udemy, Chegg, and Coursera. The table evaluates governance performance through various metrics such as governance score, trends, risk assessment, and sustainability impact. Duolingo has a governance score of 5.99, positioning it above the median compared to its peers, indicating relatively strong governance practices. In contrast, Spotify is rated below the median with a score of 4.99, suggesting areas for improvement. Udemy leads in governance with the highest score of 7.06, while Chegg and Coursera also rank above the median.

The risk score for Duolingo is 23.8, placing it in the medium risk category, whereas Spotify has a slightly lower risk score of 22.3. Other companies' risk scores are not available. The trends metric, which tracks governance improvements or deteriorations, indicates a positive trend for Duolingo (0.25) and Udemy (2.02), while Spotify shows a negative trend (-0.07). Regarding sustainability impact, Duolingo has a relatively high average positive Sustainable Development Goals (SDG) impact at 35.29%, though it also has a negative impact of -26.47%, resulting in a net impact of 8.82%. Udemy, Chegg, and Coursera show higher positive impacts of 44.12% with a net impact of 17.65%, whereas Spotify lags behind with a net negative impact of -17.65%.

Finally, gender diversity on the board is assessed through the percentage of women directors, with Duolingo having 40% female representation, comparable to Coursera and Chegg, and higher than Spotify at 30%. Udemy leads with 70% female representation. Overall, Duolingo demonstrates solid governance practices, positive trends, and a balanced sustainability profile, though there are opportunities for further improvement in governance and sustainability metrics compared to industry leaders.

APPENDIX 12: EXECUTIVE PAY

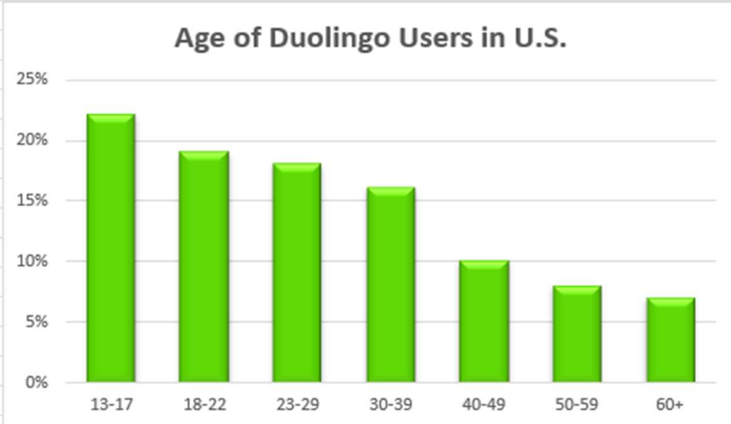
Name and Principal Position	Salary ($)	Stock Awards ($)	All Other Compensation ($)
Luis von Ahn Chief Executive Officer	750,000	0	16,500
Matthew Skaruppa Chief Financial Officer	673,333	3,183,753	16,500
Natalie Glance Chief Engineering Officer	673,333	3,183,753	15,250
Robert Meese Chief Business Officer	497,500	1,910,252	19,300
Stephen Chen General Counsel	513,333	1,591,876	16,500

EXECUTIVE PAY: The appendix contains a full breakdown of executive remuneration at Duolingo, Inc., including salary, stock awards, and other compensation for key executives. The CEO, Luis von Ahn, gets a base salary of $750,000 plus $16,500 in supplemental remuneration, but no stock awards. The base wages of other leaders, like Chief Financial Officer Matthew Skaruppa and Chief Engineering Officer Natalie Glance, range from $673,333 to $3,183,753 in stock awards and additional pay of $16,500 and $15,250, respectively. Chief Business Officer Robert Meese receives a lesser base pay of $497,500, but he also receives $19,300 in additional remuneration and a sizeable stock grant of $1,910,252. General Counsel Stephen Chen receives $513,333 in salary, $1,591,876 in stock awards, and additional compensation of $16,500.

A significant amount of executive compensation consists of stock awards, demonstrating a focus on equity-based incentives to match the interests of leadership with the generation of shareholder value. The higher salary, which likely includes advantages such as retirement contributions and other perks, is consistent across leaders. The pay plan represents Duolingo's approach to luring and keeping top people by striking a balance between competitive base pay and long-term equity incentives.

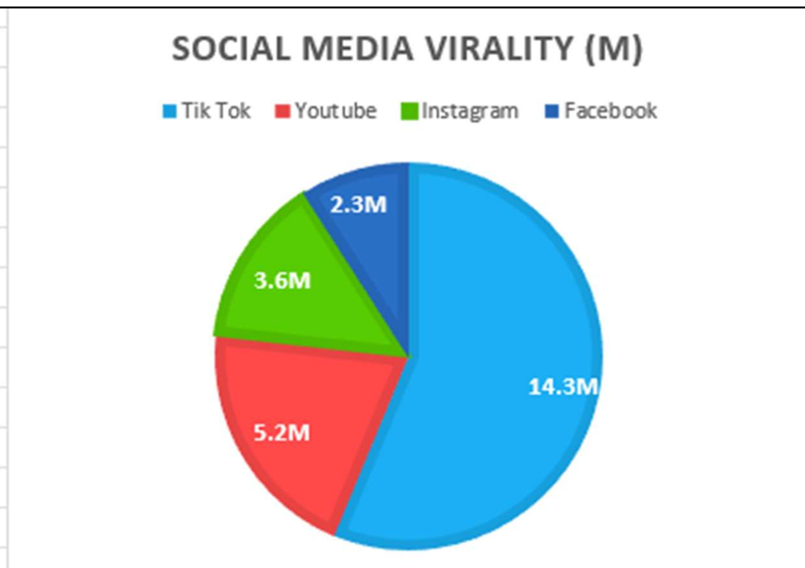
APPENDIX 13: AGE DEMOGRAPHIC

How old are Duolingo learners in the U.S.?	13-17	18-22	23-29	30-39	40-49	50-59	60+	
Percent of all U.S. learners	22%	19%	18%	16%	10%	8%	7%	100%



APPENDIX 14: SOCIAL MEDIA

	Followers
Tik Tok	14.3
Youtube	5.2
Instagram	3.6
Facebook	2.3
Total	25.4



APPENDIX 15: DUOL POLL

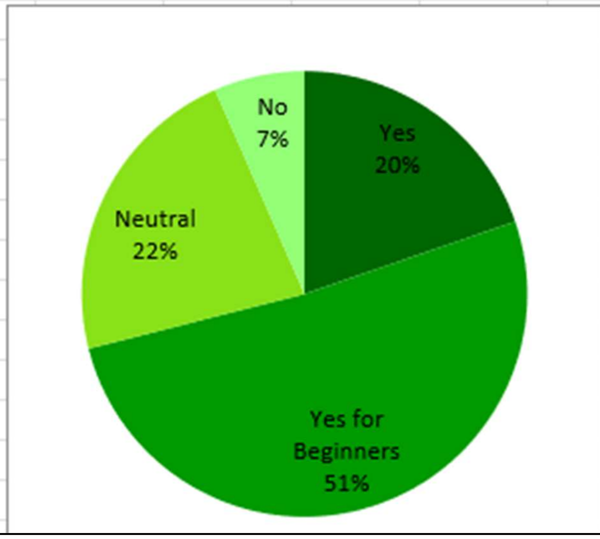
DOES DUOL WORK?

Sorting opinions based on Yes, Yes for beginners, neutral, and no

15 Forum Posts & sorting top 5 highest upvoted comments related

An upvote score signifies mutual agreement amongst others as downvotes, or disagreement reduces this score

	Yes	Yes for Be	Neutral	No	Total
DUOL	15	39	17	5	76
	20%	51%	22%	7%	



APPENDIX 16: REFERENCES

Ai-driven language learning startup speak raises $78M at a $1B valuation. Dataconomy. (2024, December 30). https://dataconomy.com/2024/12/10/speak-raises-78m-at-a-1b-valuation/

Bloomberg. (n.d.). Bloomberg.com. https://www.bloomberg.com/

Cindy Blanco, Ph. D. (2025, January 6). *How does language learning differ across generations?*. Duolingo Blog. https://blog.duolingo.com/dear-duolingo-how-does-language-learning-differ-between-generations/

Duolingo Inc 10K. 0001562088-24-000050 | 10-K | XBRL Viewer | Duolingo INC. (n.d.). https://investors.duolingo.com/node/9461/xbrl-viewer

Interim corporate responsibility & impact factsheet 2024. (n.d.-a). https://investors.duolingo.com/static-files/14890367-ff8c-446e-a564-410450a2f51f

Kendra Ross, Ph. D. (2024, December 2). *The 2024 duolingo social impact report*. Duolingo Blog. https://blog.duolingo.com/social-impact-report-2024/

McDeal, S. (2024a, June 4). *Duolingo Super 12 m plan: Individual EGP E£359.99 (~A$11.51), family plan (6 members) E£569.99 (~A$18.22) @ duolingo (VPN req)*. OzBargain. https://www.ozbargain.com.au/node/849217

Reddit - dive into anything. (n.d.-b). https://www.reddit.com/