A Work Project, presented as part of the requirements for the Award of a Master Degree in Economics / Finance / Management from the NOVA – School of Business and Economics.

EQUITY RESEARCH VMWARE – TRANSITIONING TO SAAS

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A Project carried out on the Master in (Economics/Finance/Management) Program, under the supervision of:

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Abstract

VMware (VMW) is a cloud computing and virtualization company, based in the United States of America. The growing enterprises' preference for hybrid-cloud strategy and subscription-based solutions is fueling the next phase of VMware's growth. The purpose of this paper is to find the intrinsic value of VMware by applying different valuation methodologies in order to provide an investment recommendation to value investors as of 28-01-2023.

Keywords

Software, Cloud Computing, SaaS

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This report is part of the … report (annexed) and should be read has an integral part of it.

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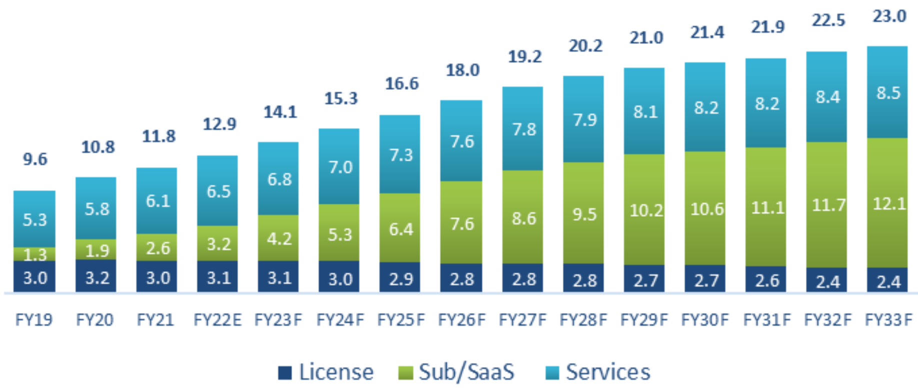
Forecasting

Revenues

The forecast of the revenues was done by the following breakdown: (i) Licences, (ii) Subscription & SaaS, and (iii) Services. The services revenues represent 52.2% of total revenues for FY21, while licenses revenues represent 25.8%, and the Subscription & SaaS - 22%. To build the revenue forecast of Licenses and Subscription & SaaS it was considered a top-down approach in which the revenues of these business units are estimated by sizing the total market and then estimating VMware's market share. On the other hand, the service revenue forecast is done by a bottom-up approach and is divided into (i) Software maintenance and (ii) Professional services. Figure 20 below presents the revenues forecast per segment.

Figure 20. VMware Revenue Forecast (USD B)



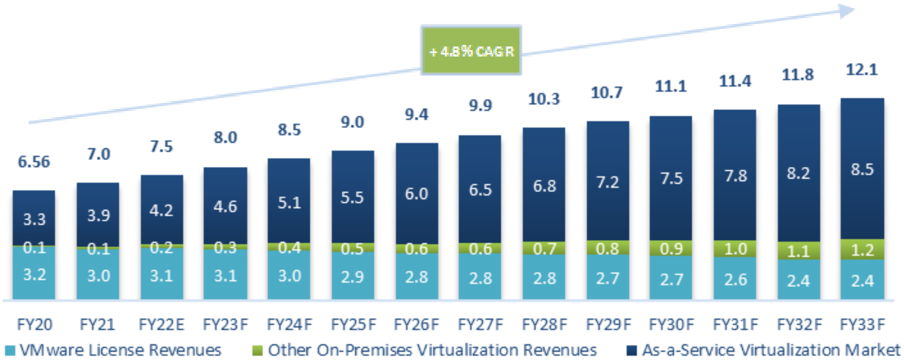
Source: VMware Financial Statements, Own Projections

For the forecast, the following key takeaways were considered: (i) Multi-cloud is considered the next phase of growth of the company so VMware's ability to capitalize on its market leader position in private cloud data centers to lead in a multi-cloud IT environment is a key-value growth driver, (ii) Transition of customers from licenses to a subscription model, thus, Licences revenues are projected to decrease and Subscription & SaaS are projected to capture the transition of new customers, so is expected that in FY25 Subscription & SaaS would represent 35%+ of total revenues.

For the license revenues forecast, the virtualization market was considered as the best proxy, and according to market research, this market was valued at USD 6,56 B in FY20 and is expected to grow at a CAGR 6.22% and reach USD 9.9 B in FY26. Also, according to IDC the percentage of As-a service from the worldwide whole cloud outlook in 2021 corresponds to 55.7% and it is expected to grow to 64.1% in 2025. The complementary percentage from the cloud outlook corresponds to **on-premises/Licenses** operations**.** As a result, the on-premise virtualization market is estimated by the multiplication of (i) size of the virtualization market and (ii) on-premises/Licenses percentage (the inverse of As-a service percentage from the cloud outlook market). Furthermore, the licenses revenues are estimated by the multiplication of (i) the on-premise virtualization market and (ii) the market share of VMware (95.8% in FY21). After FY26, the virtualization market growth and the on-premises/Licenses percentage are expected to gradually decrease to 3.09% and 30% respectively.

Figure 21 below exhibits the license revenues during the forecast period.

Figure 21. VMware License Revenue Forecast (USD B)

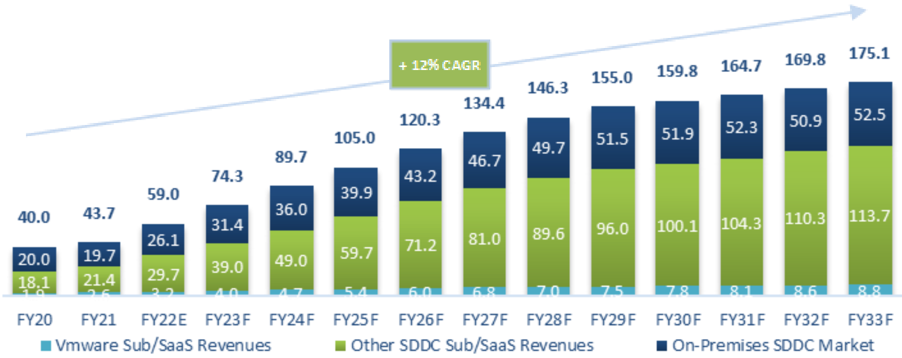


Source: VMware Financial Statements, IDC, Mordor Intelligence, Own Calculations

Similarly, for the subscription and SaaS revenue forecast, the best proxy was the Software-Defined Data Center (SDDC) market. According to MarketsandMarkets, the global SDDC market size in 2020 was USD 43.7 B and is expected to have a CAGR of 22.4% until 2025 and reach USD 120.3 B. The expected increase is due to the cost reduction in hardware when a company switches to a software-defined data center to manage its resources.

The As-a-Service SDDC Market Size is estimated as the multiplication of (i) SDDC market size and (ii) As-a-service percentage from the worldwide cloud outlook (55% in 2020 according to IDC). At last, the subscription and SaaS revenues are estimated as the multiplication of (i) As-a-Service Infrastructure Software Market Size and (ii) the market share of VMware (10.8% for FY21). The SDDC market growth is expected to gradually decrease to 3.1% from FY27 to FY30 and the market share of VMware is also expected to decrease from 10.76% in FY21 to 7.72% in FY26 since the overall sector is expected to increase significantly and new players are expected to acquire part of the SDDC market thus, a decrease in the market share for the overall market is expected. Figure 22 below exhibits the subscription and SaaS revenues during the forecast period.

Figure 22. VMware Subscription/ SaaS Revenue Forecast (USD B)

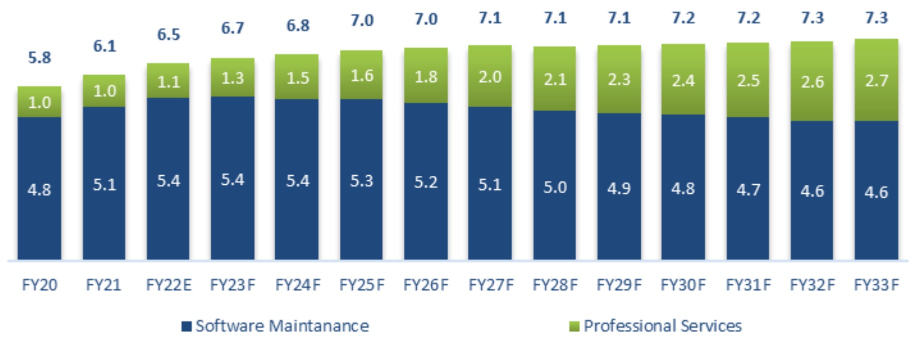


Source: VMware Financial Statements, IDC, Markets and Markets, Own Projections

As mentioned before, the Services revenues are forecasted using a bottom-up approach and this revenue is divided into (i) Software maintenance and (ii) professional services. For the FY21, Software maintenance represents 83% of total service revenues and professional services the remaining 17%. The professional services depend on the number of licenses and subscriptions; thus, this item is projected as a percentage of the combined revenues of subscriptions and licenses. On the other hand, software maintenance entitles customers to receive major and minor program updates and technical support and they depend on the number of licenses; thus, the growth rate is expected to be the average growth of the last three years from the licenses revenues since the average contract for support services is approx. 3

years. Overall, services revenues are projected to have a CAGR of 3.14% from FY21 to FY31. Figure 23 below exhibits the Services revenues during the forecast period.

Figure 23. VMware Services Revenue Forecast (USD B)

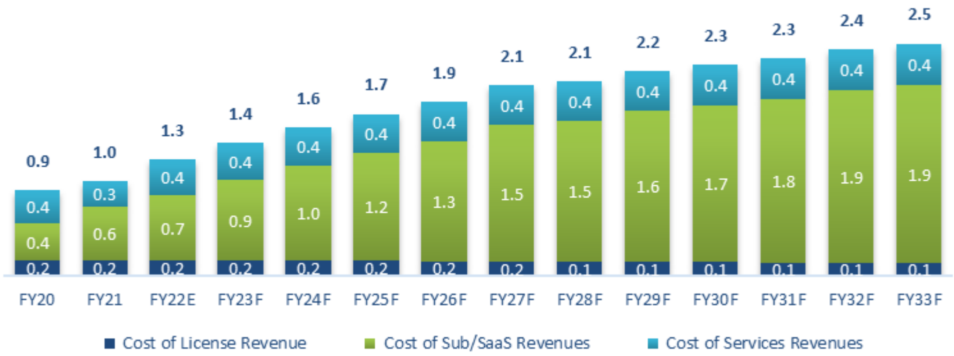


Source: VMware Financial Statements, Own Projections

Cost

The cost of Licenses, Subscription & SaaS, and Services are projected and estimated as the average percentage over revenues of the last three years corresponding to 5.2%, 21.8%, and 6.0% respectively (Figure 24).

Figure 24. VMware Cost of Goods Sold Forecast (USD B)



Source: VMware Financial Statements, Own Projections

Expenses

The expenses of the company are (i) Research and Development (R&D), (ii) Sales and Marketing, (iii) General and administrative (G&A), and (iv) Depreciation and Amortization (D&A).

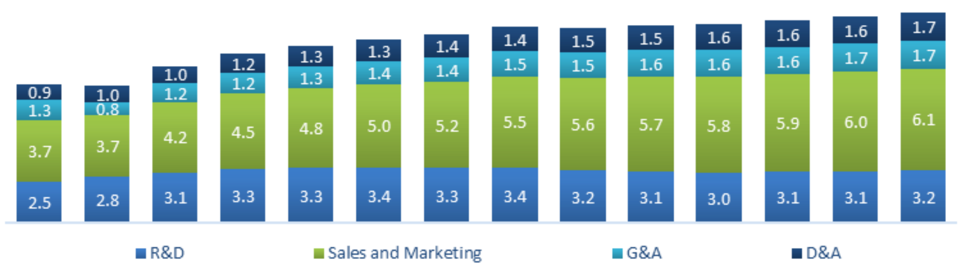
R&D expenses have been on average 23.4% of sales for the last three years which reinforced the bold new vision of VMware software-defined data centers. Considering that the company has been developing new products and transitioning to a different business model, the R&D expenses in the last years were significantly higher than the average of its peer competitors of 17.21% (see Figure 25). Because of this, R&D expenses in the first projected years are expected to be higher than the industry average due to the transition to the SaaS delivery model; consequently, The R&D expenses are expected to stay constant until FY23, and then they are projected to gradually decrease to the industry average of 17.2% on FY31.

Figure 25. R&D Expenditure as % of Total Revenues

Source: Financial Statements

On the other hand, expenses of sales and marketing and G&A are on average 33.0% and 9.1% respectively from total revenues (in the past three years). These items are forecasted as a percentage of revenues during the projected period. Finally, the D&A is forecasted considering the value of depreciation and amortizations of the current period over the value of the PP&E of the previous period and the average of this value for the last two years corresponds to 77.6% and is expected to be constant during the forecast period. Do note that the financial statements of the company don´t provide enough information to estimate depreciation forecast based on equipment purchases and depreciation schedules. (figure 26).

Figure 26. Costs Forecast (B USD)



Source: VMware Financial Statements, Own Projections

Interest

The interest expenses were USD 149 M and USD 204 M in FY20 and FY21, respectively. The interest expenses are based on two series of senior unsecured notes issued in August 2017 and three series of unsecured senior notes issued in April 2020. The notes issued in August have maturity on 2022 and 2027 with an interest of 2.95% and 3.9% respectively and principal of USD 1,500 and 1,250 M. On the other hand, the senior notes issued in April 2020 have maturity on 2025, 2027 and, 2030 with an interest rate of 4.5%, 4.65%, and 4.7% respectively with a principal amount of USD 750, 500, and 750 M. The total principal amount is USD 4,717 M. Considering that the proper driver for interest expenses is total debt, the forecast of this item will depend on the total debt of the previous year (which is estimated considering the capital structure of the WACC assumptions in the forecast balance sheet) multiplied by the cost of debt (forward-looking estimate), corresponding to 2.17% (see the cost of debt estimation section) during the forecast period. Do note that since the DCF valuation method doesn´t include interest expenses in the cashflows but on the WACC these projected interest expenses do not impact the valuation, nevertheless they are estimated and forecasted to maintain credibility and consistency in the model.

Non-core operations

- **Investment income:** VMWare currently holds an investment portfolio that includes non-US financial instruments and non-US financial institutions. The value driver for the forecast of this account is the prior year's excess cash. The average investment income over the excess cash of the last three years corresponds to 20.4% and it is projected to stay constant during the forecast period, while the excess cash varies as a function of the total invested capital, financial debt, and equity.
- **Other income/expenses & Realignment:** Other income/Expenses for FY21 come from the unrealized gain in the initial public offering of equity securities of USD 163 M. Any volatility in the trading stock introduces a degree of volatility to the income statement of VMware, thus it is assumed that the account would remain constant at USD 92 M during the forecast period which is the average returns in the last three years. On the other hand, the realignment expense of USD 42 M in FY21 was due to VMware's plan to streamline its operations and better align its resources. In such a plan, there were structural changes, like eliminating 280 positions, and the actions of this plan were substantially completed by the end of FY21, thus the forecast of this account is zero for the forecast period.

Working Capital

The accounts considered in the estimation of the working capital are the following: (i) accounts receivable, (ii) other current assets, and (iii) accounts payable. Accounts receivable are forecasted using the average collection period of the last three years corresponding to 59 days during the forecast period and rotating the account over revenues. Similarly, other current assets are also forecasted with the average of other current assets period which corresponds to 12 days during the forecast period, and it is rotated over revenues. Finally, the accounts payable are forecast by using the average payable period of the last three years, corresponding to 65 days, and rotating this account over total costs.
Figure 27 below presents the estimation of the working capital.

Figure 27. VMware Working Capital Forecast (B USD)

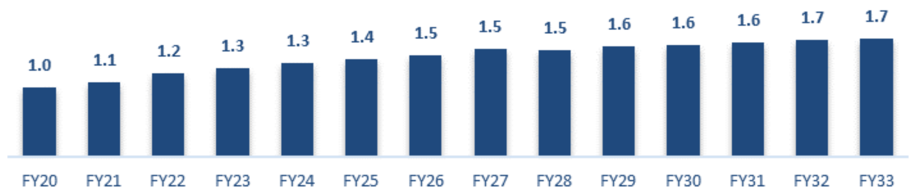
Source: Own Calculations

The working capital requirements as a percentage of revenues are expected to be around 18% during the forecast period. Do note that the non-cash working capital/sales of the software (system & application) according to Damodaran is 13.15%.

Capex

The forecast of the property plant and equipment is done as a percentage of revenues. PP&E include: (i) Equipment and software, (ii) Buildings and improvements (iii) furniture and fixtures, and (iv) construction in progress. The average PP&E over sales of the last three years correspond to 11.8% and is it projected to stay at this level for the forecast period. As mentioned before, the D&A is forecasted considering the prior year PP&E and they are on average 8.8% of total sales during the forecast period. The estimation of the CAPEX is estimated as the variation of PP&E plus the D&A. Figure 28 shows the CAPEX projection. The CAPEX corresponds to approximately 9.1% of total revenues during the forecasted period.

Figure 28. VMware's CAPEX forecast.



Source: Own Projection

DCF Valuation

The valuation of VMware is done by a discounted free cash flow (DCF) model using the weighted average cost of capital as a discount rate in US dollars. The valuation date of reference is January 2023, thus the first cash flow to be considered is FY23. Do note that the fiscal years ended January 29, 2021, January 31, 2020, February 1, 2019, and February 2, 2018, are referred to as fiscal 2021, fiscal 2020, fiscal 2019, and fiscal 2018 respectively. Is important to highlight that the company faced a spinoff from Dell Technologies, and it paid a special dividend of USD 11.5 B to Dell Technologies in FY22. Because of this, VMware increased its total debt by USD 6 B through bond issuance, USD 4 B of additional borrowings from term licenses commitments, and USD 1.5 B with cash on hand. The reason why the applied methodology is enterprise DCF instead of adjusted present value even though both reach the same result is that even though the company is facing strong changes in its capital structure "by calculating unleveraged free cash flow, as if the company was entirely financed with equity, one can compare operative performance across industries and companies regardless of capital structure and this can lead to better forecast and performance measures"(Koller, Goedhart, Wessels, p.148). Moreover, considering that the software industry is not heavily dependent on invested capital (tangible assets) indicators such as the RONIC are not accurate performance measures, therefore, having unleveraged cash flows can help assess more accurately the past and future performance of the company across companies and industries. Do note that the cost of capital (WACC) is estimated for each forecast period, and its change is a function of the target D/E ratio and macroeconomic variables.

Discount rate

For the estimation of the cost of capital (WACC) the CAPM (with country risk) was used with the following parameters:

Risk-free (1.48%): Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity.

Equity Risk Premium (6.43%): Arithmetic Average from the spread between Stocks returns (S&P 500) and T.Bonds from 1928 to 2020 (Source Damodaran).

Tax Rate (21%): Statutory tax rate of the United States.

Unlevered beta (0.74): Average unleveraged beta from peer comparable (see multiple valuation for more detail on the peers). The unlevered betas were estimated by linear regression of the returns of each peer company versus the MSCI world index (MXWO), and afterwards deleveraging the obtained betas with the D/E ratio of each company. Moreover, the assumptions considered were that the beta of the tax shield is equal to the unleveraged asset beta and that the company is targeting a D/E ratio. The fundamental reason why the unleveraged beta is estimated using its peers is that the regression of VMware returns over the MSCI world index returns, gives a wide 95% confidence interval for the beta (0.817 and 1.316, with a P-value of zero), thus using peers to estimate the beta minimize statistical error.

D/E ratio: This value changes every period until FY29 in which the company reaches the target D/E ratio of 18.1%, which corresponds to the peer comparable average. The values in the first years were estimated using the book value of net debt and the market value of equity. The D/E is assumed to gradually decrease for six years until reaching stability. The company had declared that it would deleverage to this value in two years, nevertheless, the company guidance is not taken at face value, and considering that the increased its debt by USD 10 B in FY22 to finance the dividend payment to Dell Technologies of USD 11.5 B the model extent the deleveraging time to six years.

Figure 29.
VMware Country Risk Calculation

VMWare Country Risk	Weighted Average: CRP	Weight (By Revenues)
Africa	4.9%	2%
Asia	1.0%	18%
Australia & New Zealand	0.0%	3%
Caribbean	5.3%	1%
Central and South America	4.0%	1%
Eastern Europe & Russia	2.1%	2%
Middle East	1.5%	2%
North America	0.0%	53%
Western Europe	0.8%	18%

Source: Damodaran country risk by region.

Country Risk: VMware has operations in all different continents thus assuming that the country risk of the company is zero because its headquarters are in Palo Alto, California is inaccurate and unrealistic. A simple approach in which the overall country risk of VMware can be estimated is by dividing the revenues of the company by the following regions: Africa, Asia, Australia & New Zealand, Caribbean, central and south America, Eastern Europe and Russia, Middle East, North America, and Western Europe. Afterward, using Damodaran country risk by region, which is estimated using default spreads from traded country bonds and default-free government bonds or with credit default swaps, and using the revenues by regions as weights is possible to calculate a weighted average country risk of the company. The table shows the country risk by region with its corresponding weights. The estimated total country risk on the company is 0.6% which is added to the cost of equity (Figure 29). The estimation of country risk is pragmatic and there are several ways to estimate it. Exposure to country risk should not be determined by where the company is trading but by a company's operations, which makes its estimation a critical component of the valuation of almost all multinational corporations. (Damodaran Country Risk: Determinants, Measures and Implications, 2020)

Figure 30.
VMware Cost of Debt Calculation

Cost of debt	
USD million	
VMW 2.2 08/15/31 Corp	
Date today	12/7/2021
Par Value of Bond	$ 100.00
Coupon rate (annual)	2.2%
Coupons per year	2
Maturity	8/15/2031
Years to maturity	900.0%
Current price of bond	$ 98.05
Rating Moody's	Baa3
Yield to Maturity	**2.4%**
Probability of Default	0.5%
LGD	54.0%
Cost of Debt	**2.17%**

Source: Bloomberg, 2021

Cost of debt (2.17%): The cost of debt was calculated using forward-looking estimations. Since the company has a credit rating of Baa3 according to Moody's, the probability of default multiplied by the loss given default was subtracted from the yield to maturity of VMware bond with the longest time to maturity (Figure 30). Do note that the probability of default was taken from "Corporate Defaults and Recovery Rates, 1920-2011, "Moody's Global Credit Policy", Feb 2012.

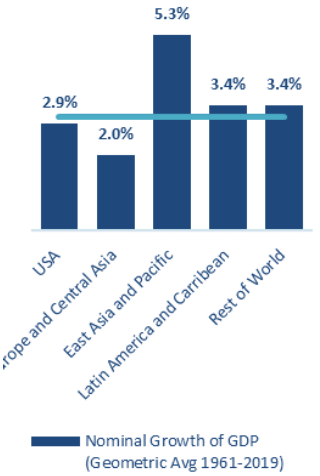
Perpetuity

The perpetuity is applied when the cash flows and long-term indicators (g, ROIC, and economic profit over revenues) are in a steady-state growth (a steady state is reached in FY33). Do note that the present value of the perpetuity is 71% of the total enterprise value of the company. To maintain consistency with the financial statements projections the following formula was applied to estimate the perpetuity:

$$\text{Value} = \frac{\text{NOPLAT}_{t=1}\left(1 - \frac{g}{\text{ROIC}}\right)}{\text{WACC} - g}$$

Considering that in the software industry the RONIC is not an accurate estimator of performance and value creation, it is assumed that the ROIC and RONIC converge to the same value in the perpetuity, thus the previous formula is applied. The projected ROIC of VMware from FY25 to FY33 is approximately 25% while, according to Damodaran, the ROIC of the software (System & Application) industry is 22.8%. Additionally, the unleveraged free cash flows growth rate is lower than the expected g in perpetuity in all scenarios, thus the company does not grow faster that the economy in perpetuity, and the economic profit over revenues stabilize in FY30 to FY33 at approximately 18.5%.

Figure 31.
VMware's Perpetuity Gradient



Source: Bloomberg

Growth Gradient in Perpetuity

The estimated gradient is 3.1% and is estimated by the weighted average of VMware's revenues by region and the nominal growth of GDP (Geometric Avg 1961-2019) (Figure 31).

Adjustments to Equity value

The projected debt of the company for FY23 (Dec 2022) is USD 14.3 B and with excess cash of USD 275 M for a total net debt of USD 14.1 B. This amount was subtracted from the EV to estimate the value of equity and price per share. Do note that the forecast of debt on the balance sheet was estimated following the D/E assumptions made on the WACC. In more detail, the model estimates the EV for each forecasted year, and the future debt is a percentage of that EV (the same percentage that is considered in the WACC). This implies that: (i) the total equity is estimated by the difference between the invested capital and the forecast debt, and (ii) the payout ratio and transactions with shareholders are an output of the model (instead of an input).

Equity Value and Price per Share

The output of the DCF valuation gives an enterprise value of USD 78,605 B and an equity value of USD 64,506 B. Considering VMware has 419.7 M shares outstanding, the implicit share price of the company is USD 154 per share.

Multiple Valuation

The companies selected for the relative valuation approach were companies in the same industry and with comparable business models (at least in one core business unit). The companies are the following:

- **Microsoft (NasdaqGS: MSFT)**: Develops, licenses, and supports software, services, devices, and solutions worldwide.
- **Oracle Corporation (NYSE: ORCL):** Computer Programming, Data Processing, And Other Computer Related Services
- **ServiceNow, Inc. (NYSE: NOW):** Provides enterprise cloud computing solutions that define, structure, consolidate, manage, and automate services for enterprises worldwide.

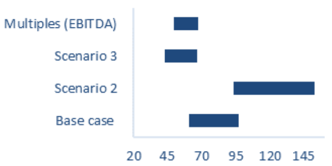
- **NortonLifeLock Inc. (NasdaqGS: NLOK):** Provides cyber safety solutions for consumers worldwide.
- **Citrix Systems, Inc. (NasdaqGS: CTXS):** Enterprise software company, provides workspace, app delivery and security, and professional services worldwide.

The selected multiples for the valuation are EV/EBITDA and P/E ratio. The average EV/EBITDA is **19.7x** and a median of **19.6x** (Service now has an EV/EBITDA multiple of **159.8x** thus is an outlier so it is excluded from the EV/EBITDA sample). On the other hand, for the P/E ratio, multiple one company presents negative earnings (ServiceNow In) thus its implicit P/E multiple is not considered. For the remaining companies, the average P/E ratio is **27.3x** with a median of **25.1x**. Considering that the EBITDA of VMware in FY21 is USD 3,413 M and its earnings per share is USD 4.86 the relative valuation set the enterprise value of VMware between USD 49,120 B (EBITDA multiple) and USD 46,075 billion (P/E multiple).

Scenario & Sensitivity Analysis

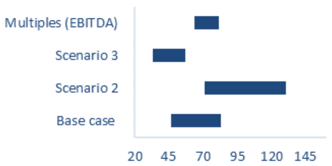
The following scenarios were considered: (i) Base case (ii) Scenario 2 (optimistic) and (iii) Scenario 3 (pessimistic). The difference between the three scenarios comes from the sales and cost drivers. The base case refers to the scenario that was referenced in the previous sections. Scenario 2 considered a lower R&D expense and a constant market share for the sub/SaaS sector while Scenario 3 considered the highest R&D expenses and a gradual decrease in the market share of the Sub/SaaS sector.
The output of the scenario analysis for the enterprise value, equity value, and price per share are shown in Figures 32, 33, and 34.

Figure 32.
VMware Enterprise Value Valuation (B USD)



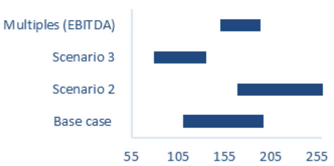
Source: Own Calculations

Figure 33.
VMware Equity Value Valuation (B USD)



Source: Own Calculations

Figure 34.
VMware Price per Share Valuation (USD)



For the Sensitivity analysis, was considered a WACC of (+/-) 1% with 0.5% intervals and a growth rate of (+/-) 1.5% with 0.5% intervals. The results are shown in Appendix 5.

Overall Output and Investment Recommendation

Figure 32, 33, and 34 present the overall output of the model, which considers the different scenarios and valuation methodologies. The suggested price range of the stock is (USD 131 to 196) which comes from estimating the median of the minimum output scenarios (131) and the median of the maximum output scenarios (196) as shown in figures 32, 33, and 34. Thus, the expected price of VMware in December 2022 is 163 (average and median of such values). Considering that the stock price as of (17/12/2021) is USD 114.7 per share, the expected capital gain for an investor that purchases the stock on (17/12/2021) and sells it on 31/12/2021 is 42.3%, which implies a strong buy and hold position since the expected return is approximately 3.5x higher than the expected return of the S&P 500.

Appendix – Company Report

VMWARE

COMPANY REPORT

ENTERPRISE SOFTWARE

29 JANUARY 2022

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Equity Research VMware

Recommendation: A BUY position is recommended with a price target FY23 of USD 163.00, representing a total shareholder return of 42.3%. Even though SaaS transition is lumpy, VMware has a sticky customer base and a fast-growing market to address driven by the increasing complexity of the multi-cloud environments.

- **Hybrid-Cloud:** The Software-Defined Data Center (SDDC) market is expected to grow by a CAGR of 22% between 2020 and 2025, mainly driven by a spreading hybrid-cloud strategy adoption across organizations. Multi-cloud is the next phase of VMware's growth leveraged by the company's powerful market position as a leader in private cloud.

- **Subscription and SaaS Transition**: VMware's focus is on the transition to a subscription model from the traditional on-premises model. The company gave guidance of 40+% SaaS bookings of total bookings in FY25. Given, that the company transition has been slower than the market expectations during FY22, we project SaaS revenues to account for 35% of total revenues in FY25 (from 22% in FY21) reaching USD 5.4 B.

- **Spin-off:** VMware's spin-off from Dell Technologies was finalized in Q4'22. An USD 11.5 B special dividend was distributed to VMware's shareholders on November 1st causing a significant drop in the share price.

Company description

VMware is a cloud computing and virtualization company. It was founded in 1998 in Palo Alto, California and since then was providing solutions to enable organizations' digital transformation. VMware is a leader in virtualization technologies and the private cloud. Now, the company is on a mission to become a leader in the multi-cloud space.

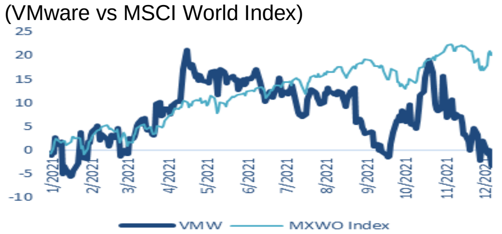
Recommendation:	**BUY**
Vs Previous Recommendation	*n.a.*
Price Target FY21:	**163.00 $**
Vs Previous Price Target	*n.a.*
Price (as of 16-Dec-21)	**114.7 $**

Source: Yahoo Finance

52-week range (USD)	108.80-172.00
Market Cap (USD B)	48.1
Outstanding Shares (M)	420

Source: Yahoo Finance

YTD Net Cumulative Returns
(VMware vs MSCI World Index)



Source: Yahoo Finance

(Values in USD M)	FY21	FY22E	FY23F
Revenues	11,767	12,823	13,734
EBITDA	3,413	3,092	3,227
Net Profit	2,058	1,995	1,690
EPS	4.86	4.61	4.03

Source:

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Company Overview

Company Description

Figure 1.
VMware's logo

Source: VMware

VMware was founded in 1998 in Palo Alto, California, beginning its activity in the virtualization market. The company was acquired in 2004 by EMC for USD 625 M. In 2007, the IPO of 33 M shares of VMware's Class A Common Stock has been priced at USD 29 per share on the NYSE. Since then, the total cumulative net return exceeds 450%. In 2007, Dell acquired EMC for the record USD 74 B, becoming the majority shareholder of VMware. On November 1st, 2021, Dell announced the completion of the spin-off of VMware from Dell. VMware is now a stand-alone company with simplified governance and capital structure to allow flexibility for the execution of the company's multi-cloud strategy.

VMware's software provides a flexible digital foundation to enable businesses in their digital transformation journey. The company is best known for its server virtualization technologies used to virtualize on-premise data center servers. VMware's vSphere is a market leader with an 11.7% market share of the leading virtualization technologies (Statista, 2021). Overall, IDC estimates that VMware has approx.85% market share of the x86 server virtualization market, showing that there might be little growth potential given that some mission-critical workloads may never be virtualized. As the virtualization market continues to mature, the company is diversifying its product mix towards solutions that help customers utilize virtualization as the foundation for private, hybrid, and multi-cloud computing. VMware's offerings are in the areas of Multi-cloud, Virtual Cloud Networking, Digital Workspace, Application Modernization, and Intrinsic Security.

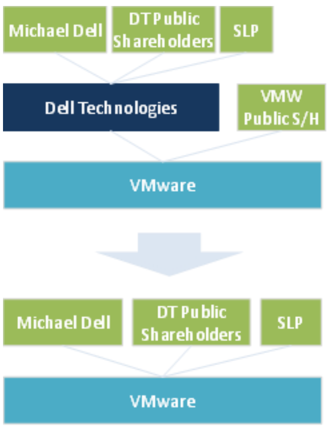
VMware reported revenue of USD 11.8 B for FY'21 representing 8.8% growth year-over-year. The company's License revenue declined by 4.65% while its Subscription and SaaS segment enjoyed an increase of 37.83% from FY'20 due to the increasing customer preference for subscription-based solutions and the company's SaaS transition. VMware operates worldwide with 50% of the revenue coming from customers based in the United States. No other country accounted for 10% or more of the revenue during each of the last three fiscal years. The company revenue has been growing at a CAGR of 10% since 2015.

Since the IPO, VMware has not historically paid nor expects to pay regular dividends on its common stock in the future. In December 2018, the company paid a special dividend of USD 11 B, with a per-share amount of USD 26.82. The terms of the recent spin-off included a USD 11.5 B special cash dividend that resulted in a USD 27.40 per share dividend payment on November 1st, 2021.

Approximately one-fourth of the dividend was funded with on the balance sheet cash and the rest with borrowings. The one-time payment may hamper VMware's ability to make any big acquisitions until 2024 as the company is planning to reduce its debt level in the next two years through the generated cash flows (Rana & Kolar, VMware Research, 2021).

Ownership

Figure 2.
VMware's Pre vs Post-Spin Ownership Structure



Source: VMware

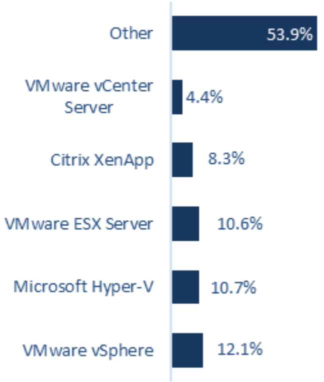
Until October 2021, VMware was a subsidiary of Dell Technologies with Dell having an 81% stake at the company. On April 14th, 2021, Dell Technologies announced that the two companies have agreed to terms in which VMware will be spun-off from Dell. The spin-off took place on November 1st, establishing VMware as a standalone company (Figure 2). After the transaction, Dell CEO Michael Dell and private equity partner Silver Lake Partners (SLP) retained the majority stake in VMware with Michael Dell set to own approximately 41 percent.

Each share of VMware Class B common stock was converted into one share of VMware Class A Common stock, which makes VMware eligible for the S&P 500. If the company becomes part of the most widely followed index in the world, it will not only gain prestige but also a stable shareholder base in the form of passive funds that will hold the shares no matter what (Powell, 2021). The spin-off greatly simplifies the corporate ownership structure and governance model which provides more flexibility and focus on M&A decisions. Mainly through acquisitions, VMware expands its SaaS portfolio thus the transaction will enable further growth opportunities as it will allow VMware to set its own course toward growth and profitability.

The spin-off also positions better VMware to achieve its goal to be the Switzerland of multi-cloud. Now, when VMware is not a subsidiary of Dell, it could establish and strengthen relationships with customers such as HPE, Lenovo, Cisco, NetApp, and Pure Storage which would allow more choice for customers in their journey to the multi-cloud environment. VMware and Dell will continue to maintain their relationship as they have agreed to a 5-year commercial agreement with optional extensions that "preserves and enhances their strategic partnership to deliver joint customer value". Preserving its relationship with Dell is crucial for VMware as Dell channel sales represented 35% of VMware's FY21 revenue. Dell will continue to sell VMware's product portfolio and both companies will continue to jointly collaborate on VxRail, VMware Cloud on Dell EMC, VeloCloud SD-WAN, Digital Workspace, and security (Moorhead, 2021).

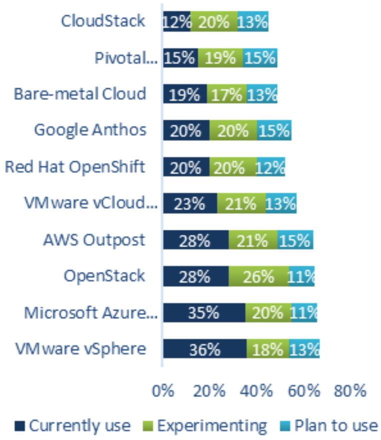
The market assessment of the announcement of the spin-off was positive – VMware's cumulative abnormal return during the 10-day event window around the announcement was 10.4%, while Dell's was 8.9%. VMware's share price jumped from USD 150.2 on March 30th to USD 170 three days after the announcement indicating investors' confidence in the spin-off transaction.

Figure 3.
Market Share of Leading Virtualization Technologies Worldwide as of December 2021



Source: Statista, data as of 2021

Figure 4.
Worldwide Usage of Private Cloud Services 2020



Source: Statista, data as of 2021

Strategy

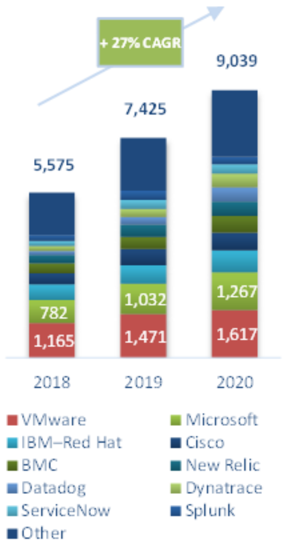
During VMworld 2021, VMware highlighted its new redefined strategy to help customers navigate the multi-cloud era and accelerate innovation with freedom, flexibility, and security. The company wants to position itself as the leader in multi-cloud and modern applications by capitalizing on its market leadership position in private cloud data centers. CEO, Raghu Raghuram, says that the company strives to serve its customers by being a trusted foundation for their most critical business operations, by offering an innovative portfolio of best-in-class solutions to fulfill their multi-cloud vision, and by having a broad set of strategic partnerships required to unlock the full potential of multi-cloud. Historically, VMware has demonstrated success in executing its strategy by becoming a leader in the virtualization market and afterward leader in private cloud (Figure 3, Figure 4). Riding the wave to becoming a leader in the multi-cloud would be challenging but VMware is on the right track. The company has already established over 4,500 partnerships with active cloud and managed service providers, including Microsoft, Google, and Oracle, and has a strategic alliance with AWS. Further, VMware has an innovative portfolio that is being continuously enhanced to meet customers' needs in the multi-cloud era. Recently, IDC named VMware a leader in the cloud system and service management software that can be used to manage any mix of private cloud, public cloud, hybrid cloud, or multi-cloud environments (Jensen, 2021) (Figure 5). Given the market leadership position in private cloud, the company is well-positioned to become a leader in the multi-cloud. Even though the current CEO of VMware, Raghu Raghuram has been appointed recently in June 2021, he has been with VMware since 2003 when the company was still a startup and was part of the leadership team that took the company through its initial IPO. We think that Raghu has the necessary market knowledge, technical know-how, and vision to execute the company's strategy.

Portfolio and Competition

VMware's Product Portfolio

VMware has a very extended product portfolio in the areas of Modern Applications, Multi-cloud, Networking, Workspace, and Security. Its products and solutions face intense competition across all markets.

Figure 5.
Worldwide Cloud System and Service Management Software Market Shares, (B USD)



Source: IDC, September 2021

- Multi-cloud

The multi-cloud solutions are split into several portfolios including Cloud Infrastructure (VMware Cloud on AWS, VMware Cloud Foundation, etc.), Hyperconverged Infrastructure (vSphere, vSAN), Cloud Management (vRealize), Cloud Security, Disaster Recovery, Software-Defined Data Center (vSphere), Telco Cloud, and VMware Cloud Providers.

VMware's vSphere is the industry's leading server virtualization software powering more than 85 million workloads across private and public clouds (Figure 4 and 5). At VMworld 2021, VMware announced project Arctic – a technology preview of the evolution of vSphere. Project Arctic will integrate cloud connectivity into vSphere making hybrid-cloud the "default" operating model and allowing customers to leverage cloud services for any workloads running on vSphere. Also, customers would be able to consume the product in a SaaS manner. In Q3'22 compute product bookings were up in the low double digits year-over-year.

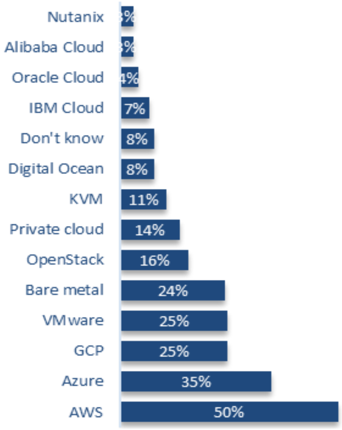
Additionally, at VMworld 2021, VMware articulated its strategy to help customers in the multi-cloud era with VMware Cross-Cloud services. Cross-Cloud Services is an integrated portfolio of SaaS solutions comprised of five core building blocks: app platform for building and deploying modern apps, cloud infrastructure for operating and running enterprise apps, cloud management, security and networking, and a digital workspace to empower the distributed workforce.

As SaaS and hybrid cloud are becoming the preferred model and strategy, organizations start to build and shift their existing workloads off-premises. With demand for on-premises infrastructure declining, VMware needs to compete with public cloud providers for customers' workloads such as Amazon and Microsoft. As can be seen in Figures 3,4, and 5, Microsoft is VMware's main competitor in virtualization, private cloud data centers, and cloud systems and services management. In FY2018, VMware entered into a strategic alliance with AWS to deliver VMware Cloud on AWS, running in AWS data centers. In fiscal 2020, VMware established partnerships with Microsoft, Google, and Oracle under the framework VMware Cloud Provider Program (VCPP) to offer solutions that run native VMware-based workloads on Azure, Google Cloud, and Oracle Cloud. Those offerings may be seen as competitive between each other and with other VCPP partners.

- Modern Applications

In 2019, VMware acquired Pivotal for $2.7 billion, bringing offerings that accelerate modern app development. Pivotal products are now part of the

Figure 6.
Most Popular Environments for Running Kubernetes Clusters Worldwide 2021



Source: Statista, July 2021

VMware Tanzu portfolio. The acquisition is promising due to the increasing importance of creating cloud-based applications based on open-source technologies that can be deployed on any public cloud. According to Statista, the container management softer and services revenue will grow by a CAGR of 19.3% between 2020 and 2024 to USD 944 M. At the time of the deal announcement, Pivotal had sales of $690 million with an annual growth rate of 26% (Bloomberg, 2021). The Tanzu portfolio allows organizations to modernize both the applications and infrastructure they run on as it delivers an open source aligned with Kubernetes distribution. During the Q3'22 earnings call, the management announced advancements in the Tanzu portfolio such as the beta version of the Tanzu Application Platform, which delivers superior developer experience for enterprises that build and deploy apps and APIs on any Kubernetes. According to research from Forrester, the ROI for organizations utilizing the Tanzu Application Service is 142%. The study finds that developers spend 5 times less time building and debugging environments which result in significant time savings with a present value of USD 10.8 M over three years (Forrester, 2019).

The primary competition for VMware's Tanzu portfolio is Red Hat Openshift (now a subsidiary of IBM) which uses a similar approach in supporting VMs alongside Kubernetes, has a strong on-premises footprint, and has established strong partnerships with public cloud providers (451 Research, 2021) (Figure 6). Other vendors such as Nutanix, also target data center virtualization and private cloud by developing solutions based on open-source technologies, such as Xen, Kubernetes, OpenShift, etc. Anyone can modify and redistribute the open-source software which could lead to lower entry barriers compared to the traditional proprietary software market. These vendors may put price pressure on VMware's offerings.

- Networking, Workspace, Security

As organizations are adopting new models and moving to the private and public clouds, they must transform their legacy networks to support interoperability across data centers, multiple clouds, branch locations, and edge devices. The networking portfolio includes solutions ranging from NSX Data Center to VMware SD-WAN that enable enterprises to bring the public cloud flexibility to their private cloud. Recently, Gartner announced VMware as a leader in the WAN edge infrastructure along with Fortinet, Versa Networks, Palo Alto Networks, Cisco, HPE.

Products in the Workspace portfolio include Workspace ONE and Horizon. Workspace ONE is integrated access control, application management, and multi-platform endpoint management in a single platform. For a fourth consecutive year, Gartner named VMware leader in Unified Endpoint Management. VMware also had the highest score in three use cases for remote workers, security-centric management, and moderns Windows PC. Workspace One and Horizon total bookings enjoyed strong double-digits year-over-year growth in Q3'22.

With the acquisition of Carbon Black in 2019, VMware launched new enterprise security solutions, including the Carbon Black endpoint security platform and the intrinsic security elements of its existing NSX virtual networking, Workspace ONE end user, and its compute offerings. The cybersecurity market is large, fragmented, and highly competitive as innovative solutions are rapidly emerging and being introduced. VMware faces competition from legacy antivirus companies such as McAfee, Norton LifeLock, established software and infrastructure providers like Microsoft, and next-generation end point providers like CrowdStrike. Additionally, new trends such as Secure Access Service Edge (SASE) and Zero Trust Network Access combine formerly distinct markets, including identity management, secure web gateway, SD-WAN, network firewall, and cloud access security brokers, which could result in a higher competitive pressure on other distributed network security offerings from VMware.

Competitive advantage

VMware is an established leader in virtualization and related compute technologies which provide the foundation for private cloud and hybrid computing (Figure 3, 4). As such, the company has become a trusted foundation for most enterprises' mission-critical workload. This is a big competitive advantage for VMware as customers' operations and success largely depend on the infrastructure providers to secure their workloads.

Further, VMware has a very extended portfolio from virtualization to multi-cloud, modern applications, and security like no other player in the market. This broad mix of products and services covers a variety of customers' needs and enables VMware to use cross-selling strategies as well as to integrate different solutions into one single product. Additionally, the company has established deep partnerships with all leading hyperscalers and cloud providers (more than 4,500 partnerships) which further enhances VMware's portfolio and reduces competitive pressures from the big software companies such as Microsoft and Oracle.

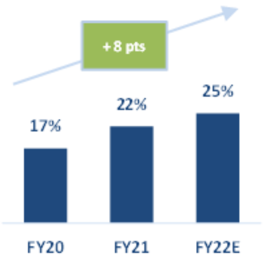
Other sources of competitive advantage include innovative products as the company has more than 4,000 patents on its technologies. Additionally, investments in infrastructure are very costly; thus, VMware benefits from customer lock-in which allows for a price premium.

Performance Analysis

In the following, a historical performance analysis is conducted by comparing VMware's operations to those of Citrix (NASDAQ: CTXS) and ServiceNow, Inc. (NYSE: NOW). We chose these companies as they, like VMware, are based in the US and approximately half of their sales are in the US, have similar maturity, and enable business in their digital transformation by offering cloud-based solutions. In FY21, Citrix license revenues were 14% of its total revenues, services revenues were 52%, and SaaS – 34%. ServiceNow, however, is entirely a SaaS company with subscription and SaaS revenues accounting for 95% of total revenues. A comparison between these peer' companies provide valuable insights on the impact of the delivery model on the business performance.

Business Model and Revenues

Figure 7.
VMware Sub & SaaS Revenues as % of Total Revenues

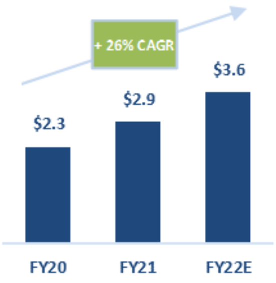


Source: VMware Financial Statements

The growing preference for customers to use a subscription model is having a profound impact on VMware's strategy. Currently, VMware's focus is on transitioning from a perpetual on-premises model to a SaaS delivery model. In a SaaS world, the software is accessed through the internet and the revenue is recognized ratably over equal intervals, unlike the license model where the customer pays upfront. According to research from IDC, worldwide perpetually licensed software revenues will decline by a CAGR of 6.1% between 2020 and 2024, while software subscription revenues will increase by 16.6%. Companies that adopt the subscription model and metrics like annual recurring revenue (ARR) usually enjoy higher valuation multiples as the subscription earnings are more predictable and those organizations can generate more revenue over the long term (EY, 2021). For instance, ServiceNow is solely a subscription company, and its EV/Revenue multiple is 22.4x (Microsoft trades at 13.8x). Additionally, utilizing a subscription model increases customer retention rates while selling costs decrease.

VMware reported a Subscription and SaaS revenue of USD 2.59 B in FY21 (37.83% increase year-over-year). In comparison, Citrix SaaS revenue grew 71.30% to USD 1.1 B, while ServiceNow reported an increase of 31.66% to USD 4.3 B in FY21. This segment contributed 22% of VMware's total revenues (Figure 7) and 26% of total bookings in FY21. During the Q3'22 earnings call, the company reported a Subscription and SaaS Revenue of USD 820 M (21.3% growth YoY). Analysts were expecting growth in the upper 20s which resulted in a drop in the share price for a third consecutive quarter this year. VMware gave

Figure 8.
VMware Annual Recurring Revenue (B USD)

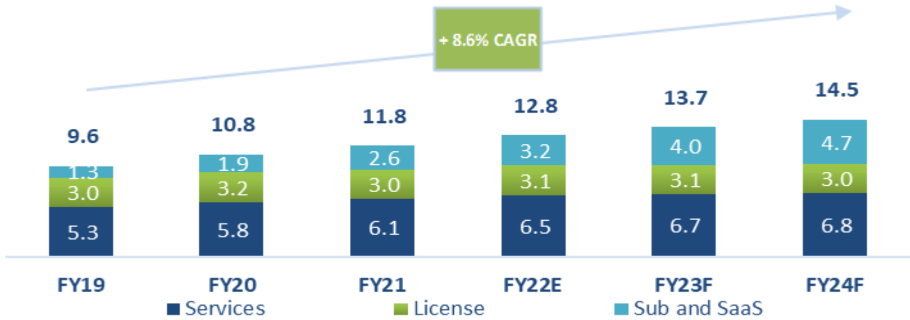


Source: VMware Financial Statements

guidance of USD 860 M Subscription and SaaS revenue for Q4'22 (21.7% increase YoY), reaching a total SaaS revenue of USD 3.2 B in FY22, representing a CAGR of 35% from FY19. In the latest VMware annual user conference, VMworld 2021, the company provided better than expected FY25 revenue guide of 10%+ growth vs FY24 with a Sub & SaaS revenue mix of more than 40% in FY25 vs. 25% this year and an ARR target of USD 7.5 B (in Q2'22 the company reported ARR of USD 3 B – 26% YoY growth as can be seen in Figure 8. To achieve this, the company expects higher bookings growth in FY23 which will start to monetize in FY24, setting the year as an inflection point and positioning the company to accelerate growth from FY25. However, the operating margins are expected to stay modest with 30% in FY25.

VMware's License revenues declined by 4.6% from USD 3.18 B in FY20 to USD 3.03 B in FY21 (Citrix license revenue dropped by 23.8% during the same period). The company reported License revenues of USD 710 M in Q3'22 (11.1% increase YoY) and gave guidance of USD 1 B for Q4'22 resulting in estimated total license revenue of USD 3.1 B for FY22 (2.5% growth). Services revenues were USD 6.1 B in FY21 and are estimated to increase by 6.2% in FY22 due to strong software maintenance renewals. In the long term, License and Services revenues will decline hurt by cloud sales growth and transition to SaaS. Additionally, recently VMware announced Project Arctic, the next evolution of vSphere, which would enable its existing customers to connect their on-premises vCenters to the cloud by converting from a perpetual license to a subscription model. vSphere, the industry-leading compute platform, powers more than 85 million workloads across private and public clouds. With Project Arctic, organizations would be able to leverage cloud services for all workloads which would drive SaaS revenues at the expense of license revenues. Figure 9 below illustrates the company's past revenue, estimated FY22 revenues, and our forecast for FY23 and FY24.

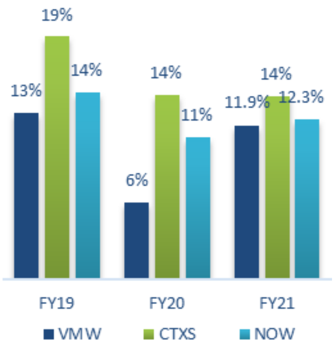
Figure 9. VMware's past and projected revenues.



Source: VMware Financial Statements and Own Projections

Profitability and growth

Figure 10.
Economic profit % Revenues



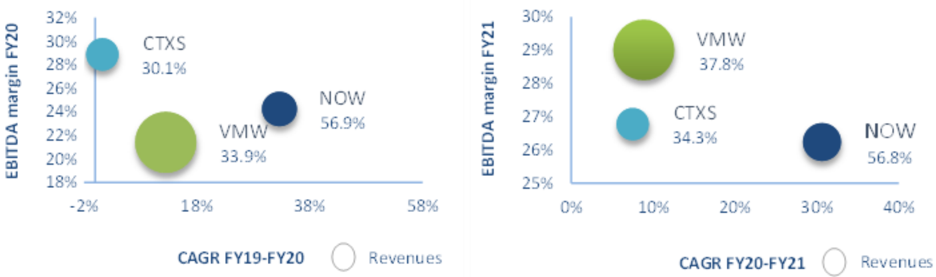
Source: Financial Statements, Own Calculations

Software companies, on average, have a high return on invested capital (ROIC) ratio due to sustainable competitive advantages driven by patent protection and customer lock-in, as well as atypical working-capital dynamics including prepayment by customers for licenses. In FY21, VMware had a ROIC of 18.8% – 7.5% increase from FY20 (Citrix – 42.7%; ServiceNow – 116.4%). ROIC in the mentioned companies was significantly driven by optimizing capital turnover.

ROIC is very volatile and varies across its peers as it is very sensitive to small changes in the operating capital. Thus, a more meaningful metric to measure performance is to divide annual economic profit by revenue (Dodd, 2005). Figure 10 illustrates the economic profit as % of revenues of VMware, Citrix, and ServiceNow over the past three years. The values are relatively stable and close among the peers, compared to the ROIC ratios. VMware had a ratio of 11.9% in FY21, Citrix – 14.1%, and ServiceNow - 12.3%. Citrix created slightly more value per unit of revenue compared to its peers.

In recent years, the Rule of 40 has emerged as one of the strongest indicators for SaaS companies' success. Reaching a combined growth rate and profit margin greater than 40% shows organizations' ability in managing growth and profitability. Investors reward companies that outperform the Rule of 40 as they have valuations measured by the ratio of enterprise value to revenue double that of companies that fall "below the line" (Depeyrot & Heap, 2018), ServiceNow outperformed the Rule of 40 by achieving a ratio of 56.8% in the last two years, which shows that the company manages well the balance between growth and profitability. ServiceNow has an EV to Total Revenue multiple of 22.4x – the highest of its peers. VMware reached a ratio of 37.8% in FY21 from 33.9% in FY20 driven by improvement in EBITDA margin (Figure 11). Citrix had a ratio of 34.3% due to higher revenue growth. Both VMware and Citrix did not make the line of 40 which could be seen in their lower trading multiples (Citrix has an EV to total revenues multiple of 4.2x).

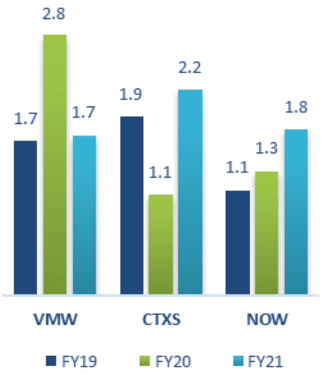
Figure 11. Rule of 40 in FY20 compared to FY21



Source: Financial Statements, Own Computations

Credit Health and Capital Structure

Figure 12.
Debt to EBITDA Ratio



Source: Financial Statements, Own Calculations

VMware had a high EBITDA to interest ratio ranging from 19 to 17 during the past three years, indicating a substantial safety net of profits to cover interest and thus a strong ability to meet short-term obligations. In the past decade, interest rates have been record low, driving coverage ratios up. If central banks decide to tighten monetary policy to cope with the rising inflation, we might observe a decrease in coverage ratios. To evaluate leverage in the low-interest-rate environment, we calculated the debt to EBITDA multiple. In FY21, VMware had a multiple of 1.7x - slightly lower than Citrix and ServiceNow (Figure 12). However, when looking at net debt to EBITDA, VMware and Citrix have a similar multiple of 1.5x, while ServiceNow is significantly lower with 0.5x showing a lower risk of leverage.

During the period between FY19 and FY21, VMware had gradually decreased its net debt to equity ratio from 1.34 to 0.58, unlike its peers. We estimate a higher ratio in FY22 due to the new debt of USD 10 B to pay off the special dividend of USD 11.5 B. However, increasing debt should not be alarming to investors as the company has doubled its current and cash ratios in the past year to 1.03 and 0.56, respectively, indicating an increasing ability to meet short-term obligations.

Historically, VMware has not paid regular dividends to its shareholders, and we do not foresee regular dividend payouts in the near future. However, the company announced that it will return cash to its shareholders through share repurchases as it will buy back USD 2 B shares until FY24. Similarly, ServiceNow does not intend to pay dividends on its common stock. Citrix, however, has paid regular dividends of USD 0.35 per share in the last two years and has approved a quarterly cash dividend of USD 0.37 in 2021.

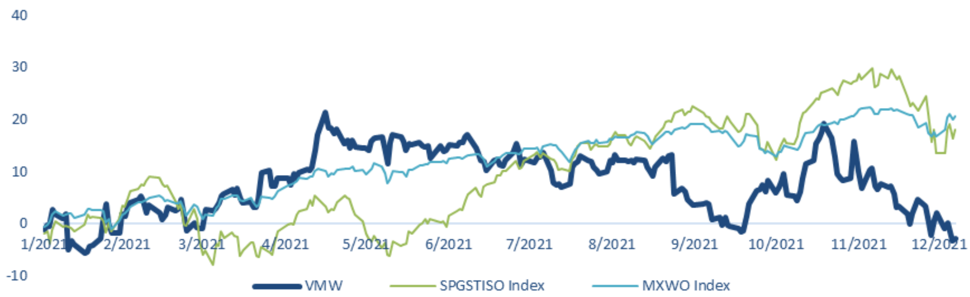
Market Performance

VMware's common stock is traded on the New York Stock Exchange under the ticker "VMW". The company initiated an IPO in 2007, selling 33 million shares for $29 per share. Since then, VMware's share price has increased significantly, reaching a record high of $205.52 in May 2019. Due to the Covid-19 outbreak, the share price dropped to $93 in March 2020 and has been volatile following to date.

Since the beginning of the Covid-19 pandemic, VMware had underperformed both the MSCI World Index (ticker: MXWO Index) and the S&P North American Technology Software Index (ticker: SPGSTISO Index) (Figure 13). As of

December 11th, the year-to-date total net cumulative return of VMware was -3%. The reason for the underperformance is due to the USD 11.5 B dividend payment on the 1st of November to finalize the spin-off transaction and the lower subscription and SaaS revenue growth in the last three quarters than expected by the financial analysts.

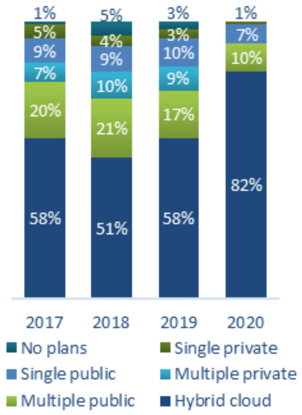
Figure 13. YTD daily total net cumulative return (in %)



Source: Bloomberg

Growth Drivers

Figure 14.
Enterprise Cloud Strategy Worldwide From 2017 To 2020, By Cloud Type



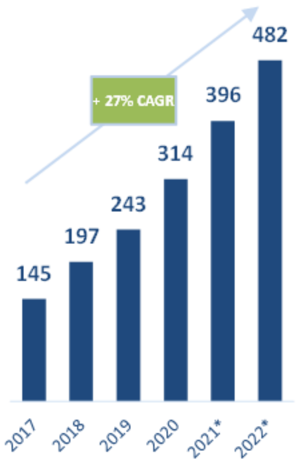
Source: Statista, Data as of August 2021

The rise in the number of applications, cloud users, and the utilization of artificial intelligence and sensors, and intelligent drivers connected to the cloud is increasing the number of workloads around the world and the need for capacity. Those workloads are running in diverse and distributed environments that are growing more complex. Workloads are expected to grow by a CAGR of 12% from 370 M to 580 M across all server operating system instances between 2020 and 2024 with rapid growth in the public cloud, telco, and edge according to an internal analysis by VMware. As workloads are running in a diverse, distributed environment, the customer need for multi-cloud infrastructure, as well as consistent security and mobility is significantly increasing. Hence, the critical drivers of growth for VMware are hybrid cloud and security, and mobility to capture new workloads and users, as well as SaaS to recapture those workloads that are moving to the cloud from the legacy infrastructure.

Hybrid cloud

Enterprises are not any longer looking for a 'cloud first' approach but about 'cloud smart'. Data shows that 92% of enterprises have a multi-cloud strategy (Luxner, 2021). As can be seen in figure 14, the hybrid cloud strategy adoption has increased from 58% in 2019 to 82% in 2020. Hybrid cloud is becoming the preferred IT strategy as it enables corporate clients to move easily and securely workloads between their on-premise infrastructure and public cloud. Even though public-cloud adoption is gaining momentum, large enterprises are not ready yet to entirely shift control of their in-house core systems, where they have invested billions of dollars, to third-party providers. The main benefits of the hybrid cloud include the control that organizations can maintain over their sensitive assets or workloads in the private infrastructure while taking advantage of the additional resources that the public cloud offers. With the ability to scale in the public cloud on-demand, organizations pay for the extra computing power only when needed and the transitioning to the cloud becomes gradual. For instance, organizations such as financial services and healthcare establishments, as well as the public sector, operate in highly regulated industries that sometimes require in-house storage of data. Those organizations are unlikely to migrate all work on public clouds. Thus, a hybrid cloud strategy serves as the foundation for their digital transformation. Frost and Sullivan report that 43% of financial firms use a hybrid cloud and 46% plan to implement one in the next two years (Frost & Sullivan, 2020).

Figure 15.
Public Cloud Services End-User Spending Worldwide (In B USD)



Source: Statista, Data as of March 2021

During 2017 and 2020, the worldwide end-user spending on public cloud services had grown by a CAGR of 29.4% to USD 314 B. It is expected to increase by 26.1% in 2021 to a total of USD 396 B while the number of workloads deployed in the public cloud is forecasted to grow by a CAGR of 18% from 126 M in 2020 to 244 M in 2024 (Figure 15). The Covid-19 pandemic along with emerging technologies such as containerization, virtualization, and edge computing is driving additional spending (Gartner, 2021). The market potential for hybrid cloud, however, might be even bigger than public cloud. Data shows that the market for total IT services spending was USD 1,071 B in 2020, 314 B of which is public cloud spend, and the rest is deployed on traditional software. Statista forecasts that the hybrid cloud market will grow with a CAGR of 18.8% between 2020 and 2026.

VMware is one of the key providers of legacy IT infrastructure. Through its partnerships with industry-leading Hyperscalers, including Alibaba, Amazon, Google, and Microsoft, the company ensures that its clients can seamlessly move operations across multiple clouds and choose between the right mix of private and public cloud – a key driver of its multi-cloud strategy. Hence, VMware is well-positioned to become a critical provider of the next-generation IT infrastructure (Bloomberg, 2021).

The adoption of hybrid cloud powers VMware's bold vision of a software-defined data center (SDDC). The SDDC market is projected to grow from USD 43.7 B in 2020 to USD 120.3 B in 2025 – a CAGR of 22.4%. This growth is due to the growing multi-cloud strategy across enterprises and the increased adoption of IoT and 5G (Markets and Markets, 2020). We used the market data for the SDDC industry to forecast VMware's subscription and SaaS revenues as this market incorporate cloud management, networking, storage, compute, and security.

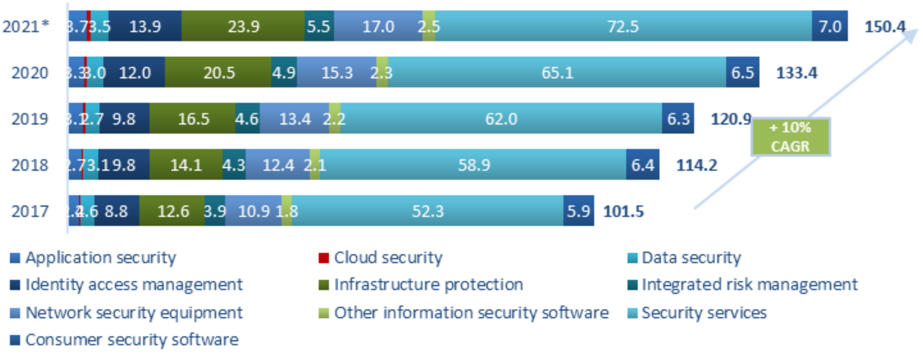
Security and Mobility

The Covid-19 pandemic caused a surge of cyberattacks and material breaches mostly driven by anywhere workforce and employees working remotely. Industries such as healthcare organizations, state and local government have been heavily victimized by sophisticated ransomware attacks, out-of-date and security and tech processes, and third-party apps (VMware, 2021). According to a survey from CSO, 74% of enterprises and mid-sized companies are expecting to increase their IT security budget, with companies in financial services, transportation, and technology more likely to report an increase of more than 10% (CSO, 2021). Statista forecasts the global information security market to increase to USD 150.4 B in 2021 (12.7% growth from 2020) (Figure 16).

Cloud security represents only a small portion of the global worldwide security spend but accounts for the fastest-growing segment (Figure 12). Statista projects a growth rate of 41.2% for 2021. VMware acquired Carbon Black for $2.1 billion in 2019, adding capabilities that help improve protection for customer networks and applications through a cloud-based platform. At the time of the transaction, Carbon Black had sales of $230 million with an annual growth rate of 24% and a significantly higher subscription rate than VMware (Bloomberg, 2021).

Consistent security across all environments and devices is critical in any cloud strategy. Thus, a key driver in the immediate and long-term will be VMware's new suite of products - security. Solutions in the security portfolio include Anywhere Workspace, Network Security, Endpoint Security, Cloud Security, and Workload and DevOps Security.

Figure 16. Information Security Spending Worldwide From 2017 to 2021 (B USD)



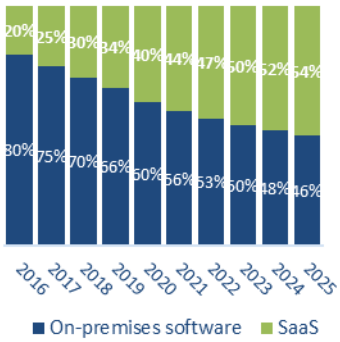
Source: Statista, data as of May 2021

Gartner has named VMware a leader in enterprise mobility management (EMM), along with Microsoft and IBM. The company's leadership is a critical long-term sales-growth driver. The greater adoption of IoT devices, network components drive the increase in the number of endpoints that access a network which results in a higher need for companies to secure and monitor those devices. With the $1.54 billion acquisition of AirWatch in 2014, VMware expanded its product portfolio into application and desktop virtualization and enhanced its expertise in this area (Bloomberg, 2021). The unified endpoint mobility management is expected to grow at a CAGR of 32.2% from 2020 to 2027 (Grand View Research, 2020).

The growth in security and mobility is levered by the increasing need for capacity and growing preference of hybrid-cloud strategy which drives the SDDC industry that we use to forecast VMware's subscription and SaaS revenues.

SaaS

Figure 17.
Worldwide Software Deployment Based On Revenues



Source: Statista, Data as of 2021

Over the past 10 years, the enterprise-software industry has been reshaped by the rise of SaaS which became the default software-delivery model. Enterprises are increasingly choosing the SaaS delivery model as, unlike the traditional model where you have to build the servers, install the application, and configure it, the applications reside on a remote cloud network accessed through the web. This way, organizations significantly reduce the time spent on installation and configuration and lower their maintenance costs.

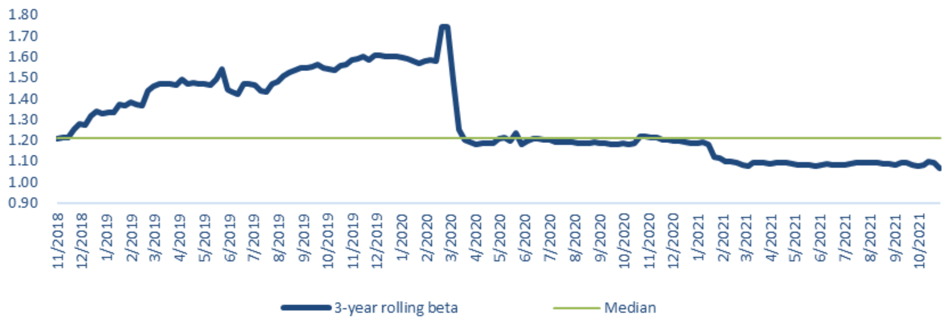
In 2010, the SaaS offerings accounted for just 6 percent of the global enterprise-software revenues, while in 2018 that share had grown to 29% (Roche, Schneider, & Shah, 2020). Statista forecasts that by 2025 SaaS revenues will reach 54% of total software revenues (Figure 17). Further, IDC estimates that the as-a-Service segments of the whole cloud spending will form the majority, growing from 55.7% to 64.1% of total cloud spend in 2025 to USD 1,301 B largely driven by the increase in SaaS revenues. The industry transitioning to subscription-based models drives VMware's subscription and SaaS revenues. We used the IDC's data to project the SDDC market subscription revenues – we estimated that by 2030, 68% of the total SDDC revenues will be in the form of subscription. We used those estimations to forecast VMware's subscription and SaaS revenues. Our projections show that by FY31 VMware's share of the SDDC market subscription revenues will be 7.72% or USD 8.1 B – a CAGR of 11% from FY21.

Macroeconomic Overview

VMware is sensitive to macroeconomic conditions in each country where it operates. Thus, a recession could negatively impact the company's ability to generate revenue and cash flows. Figure 18 illustrates VMware's 3-year weekly rolling beta between 2018 and 2021. As of November 2021, the beta is 1.07, while the 3-year median is 1.21 indicating that VMware's stock is slightly more volatile than the market. The regressions are statistically significant (P-value close to zero).

We will discuss the macroeconomic factors in the main regions where VMware operates to identify risks and opportunities.

Figure 18. VMware 3-Year Weekly Rolling-Beta



Source: Bloomberg, Own Calculations

USA

After a decade of growth, the USA GDP growth rate turned negative -3.5% in 2020 due to the containment measures following the Covid-19 outbreak. After the deep contraction, the U.S economy rebounded strongly by an annualized rate of 33.1% (Nordea, 2021). According to OECD, the real GDP is projected to grow by 6.9% in 2021 and 3.6% in 2022 as the substantial fiscal stimulus and rapid vaccination campaign have given a boost to the economy (OECD, 2021).

The impact of the Covid-19 pandemic on the IT sector is not an exception. We observed a decline in growth of business and government spending on information and business technology in the USA during 2020 which translated into a -4.7% decline in VMware' license revenues. Hence, due to the expected rebound in IT spend in 2021 and 2022, we forecast a slight decrease in license revenues in FY22 and FY23 than otherwise expected due to the SaaS transition.

The multi-billion fiscal stimulus plan of President Joe Biden in response to the coronavirus pandemic could lead to increased spending in areas such as infrastructure, health, and manufacturing totaling $5.4 trillion in the next decade which could open significant opportunities for VMware (Nordea, 2021). Additionally, Joe Biden requested a $58.4 billion budget proposal for IT at civilian agencies in 2022 – a 9.5% increase from 2021's budget according to Statista. The budget proposal pushes federal agencies to continue modernization efforts toward cost-effective commercial cloud solutions, shared services, and the reduction of cybersecurity risk (Boyd, 2021). This is a huge and growing addressable market that could accelerate VMware's sales given that the company is already a trusted partner of the federal government. The company also offers support designed particularly for U.S. federal agencies, especially those working in intelligence, aerospace, and national security.

Monetary policy continues to provide support to the economy. The Federal Reserve plans to keep the federal funds rate between 0-0.25% target range. However, recently the Fed announced that it would tighten monetary policy amid inflation fears by scaling back its massive $120 billion monthly-buying bond program. An increase in the federal rate will drive higher borrowing costs.

The country's debt-to-GDP ratio increased considerably to 127.1% in 2020 and is expected to reach 132.1 in 2022 to finance spending to support households and businesses. As a result, high income and corporate taxes could rise by $3.4 trillion in the next 10 years. An increase in the corporate tax rate could negatively impact VMware cash flows (Nordea, 2021). Currently, the corporate tax rate is 21%. If the Democratic proposal to raise the top corporate tax rate from 21% to 26.5% is accepted, VMware's enterprise value could drop by 8.5%, everything else constant.

Europe

The COVID-19 pandemic plunged the European Union into its worst-ever recession in Q2 2020, increasing inequality risks between member states. The OECD, however, forecasts that as confinement measures are gradually lifted, the economy will strongly rebound by the end of 2021. The projections show economic growth of 4.3% in 2021 and 4.4% in 2022, mainly driven by private consumption, fiscal support, and external demand, mainly from the United States (OECD, 2021).

The Next Generation EU Recovery Programme (NGEU) was agreed to by the European Council in July 2020 in response to the Covid-19 pandemic to support member states in their economic recovery, strengthen the health system, and support the green transition and digital transformation. The fund is worth 750 billion euros (equivalent to 5.4% of EU GDP in 2019) and will be mobilized between 2021 and 2023. Key priority areas for digitalization include the quality of digital infrastructure such as the deployment of 5G and the penetration of new technologies like cloud computing (Canals & Baquer, 2021). Therefore, we predict stronger demand in the next few years for VMware Telco Cloud Platform which accelerates the communication service providers' cloud modernization journey to 5G. Some of VMware's customers in this segment include one of the largest telecoms in Europe, Deutsche Telekom, which has incorporated solutions such as Workspace ONE, Telco 5G, and vRAN.

Asia

Despite the uncertainties regarding new pandemic peaks, IMF projects Asia to remain the fastest-growing region in the world with 6.5% growth in 2021, led by China and India (Figure X). However, growth projections vary among countries and largely depend on the length and severity of lockdowns and government capacity to support businesses and households. Large divergences within the region exist between emerging markets, advanced economies, and developing economies. High-tech exporters take advantage of favorable external demand and accommodative financial conditions, while service states (e.g. Thailand) with limited fiscal space fall behind (IMF, 2021).

In response to the pandemic, countries had to and are continuing to relocate resources for digitalization in health and education. The pandemic has also accelerated the fourth industrial revolution with several countries providing incentives to firms to encourage the digitalization of operations (OECD, 2021). According to IDC, organizations in Asia and the Pacific are reinventing themselves by building new technology-enabled business models to regain growth and technological edge over competitors. Cloud is emerging as a core foundation leading to public cloud services spending growth of 38% to $36. 4 billion in 2020 with projections to reach $48.4 billion by 2021 (IDC, 2021).

ESG

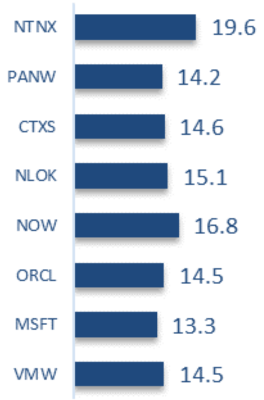
ESG investing has been gaining big popularity in the last few years. Based on data from Statista, the share of sustainably invested assets among investors will increase from 18% in 2020 to 37% in 2025. According to McKinsey, companies that have strong ESG propositions can create additional value because of:

- stronger government relations that could open new markets;
- cost reduction due to lower energy consumption;
- greater strategic freedom, easing regulatory pressure;
- employee productivity uplift due to enhanced employee motivation and

higher retention rates;

- enhanced investment returns through better allocation of capital (Henisz, Koller, & Nuttall, 2019);

Figure 19.
ESG Risk Rating



Source: Sustainalitics

The ESG Risk Rating measures the degree to which ESG issues are putting companies' enterprise value at risk. According to Sustainalytics, VMware has a low-risk rating of 14.5 placing the company 36th out of 930 organizations in the Software & Services industry. (Figure 19).

VMware put a strong focus on ESG during VMworld 2021 compared to previous years. In the latest ESG report, the company emphasized that its goal is not only to improve its operations but help its customers achieve their ESG goals using VMware solutions. VMware recently announced its 2030 Agenda which includes 30 cross-functional goals to be met by 2030 split into the areas of Sustainability, Equity, and Trust.

During FY21, the company earned placement on the Dow Jones Sustainability Indices (DJSI), was included in the Carbon Disclosure Project's (CDP) Climate A list, and was named the Best Place to Work for Disability Inclusion by the Disability Equality Index (DEI) (VMware, 2021).

VMware achieved carbon neutrality for a fourth consecutive year. Greenhouse Gasses (GHG) Intensity per Sales has decreased by 15% from FY19 to FY21. IDC research shows that VMware virtualization technologies do not only provide the foundation in the cloud era, but also reduce the overall footprint of physical datacentre infrastructure resulting in a lower number of servers, less power consumption, and cooling. IDC estimates that 66 million physical servers were not deployed in 2019 due to VMware data-center defined virtualization technologies such as vSphere, NSX, and vSAN, translating in 217,480,000MWh of incremental energy saved during the year and 95 million metric tons of CO2 avoided (IDC, 2021).

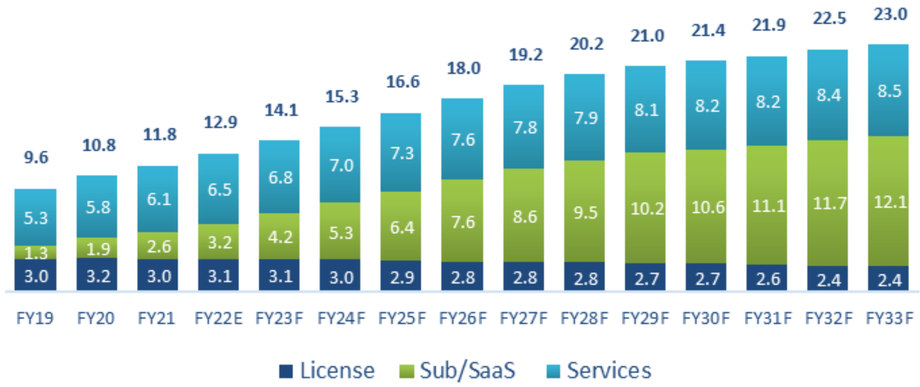
In 2020, VMware received Forbes The Best Employers for Diversity and The Best Employers for Women awards, as well as Best Places To Work for LGBTQ Equality from the 100% Corporate Equality Index. VMware's Community spending increased to 0.32% of its EBITDA in FY21 from 0.15% in FY19. Through VMware Foundation, employees can support a non-profit organization of choice by contributing 40 paid hours per year in volunteering.

Forecasting

Revenues

The forecast of the revenues was done by the following breakdown: (i) Licences, (ii) Subscription & SaaS, and (iii) Services. The services revenues represent 52.2% of total revenues for FY21, while licenses revenues represent 25.8%, and the Subscription & SaaS - 22%. To build the revenue forecast of Licenses and Subscription & SaaS it was considered a top-down approach in which the revenues of these business units are estimated by sizing the total market and then estimating VMware's market share. On the other hand, the service revenue forecast is done by a bottom-up approach and is divided into (i) Software maintenance and (ii) Professional services. Figure 20 below presents the revenues forecast per segment.

Figure 20. VMware Revenue Forecast (USD B)



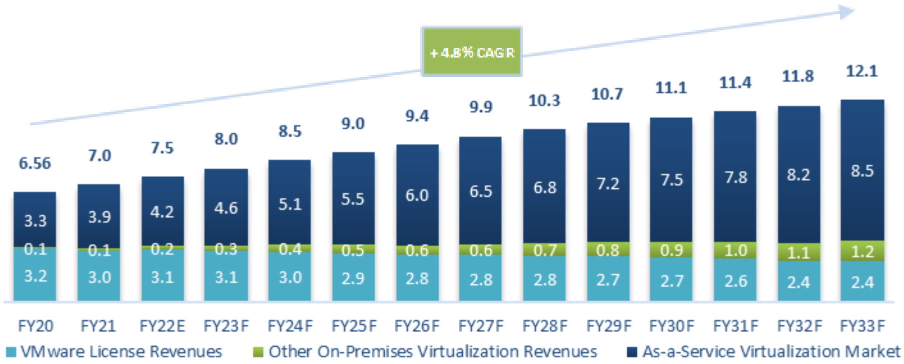
Source: VMware Financial Statements, Own Projections

For the forecast, the following key takeaways were considered: (i) Multi-cloud is considered the next phase of growth of the company so VMware's ability to capitalize on its market leader position in private cloud data centers to lead in a multi-cloud IT environment is a key-value growth driver, (ii) Transition of customers from licenses to a subscription model, thus, Licences revenues are projected to decrease and Subscription & SaaS are projected to capture the transition of new customers, so is expected that in FY25 Subscription & SaaS would represent 35%+ of total revenues.

For the license revenues forecast, the virtualization market was considered as the best proxy, and according to market research, this market was valued at USD 6,56 B in FY20 and is expected to grow at a CAGR 6.22% and reach USD 9.9 B in FY26. Also, according to IDC the percentage of As-a service from the worldwide whole cloud outlook in 2021 corresponds to 55.7% and it is expected to grow to 64.1% in 2025. The complementary percentage from the cloud outlook corresponds to **on-premises/Licenses** operations**.** As a result, the on-premise virtualization market is estimated by the multiplication of (i) size of the virtualization market and (ii) on-premises/Licenses percentage (the inverse of As-a service percentage from the cloud outlook market). Furthermore, the licenses revenues are estimated by the multiplication of (i) the on-premise virtualization market and (ii) the market share of VMware (95.8% in FY21). After FY26, the virtualization market growth and the on-premises/Licenses percentage are expected to gradually decrease to 3.09% and 30% respectively.

Figure 21 below exhibits the license revenues during the forecast period.

Figure 21. VMware License Revenue Forecast (USD B)

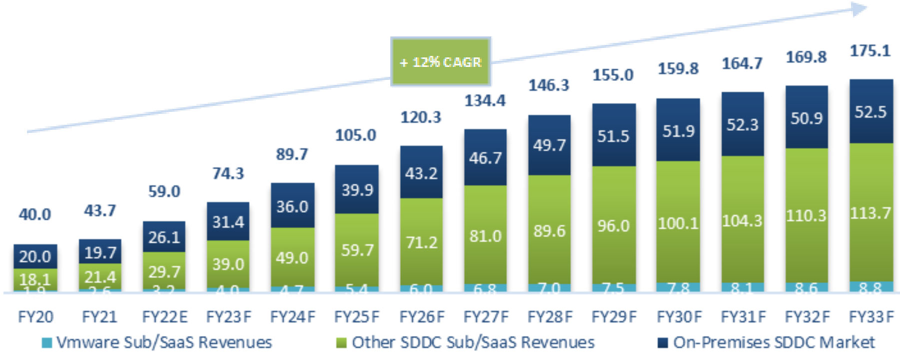


Source: VMware Financial Statements, IDC, Mordor Intelligence, Own Calculations

Similarly, for the subscription and SaaS revenue forecast, the best proxy was the Software-Defined Data Center (SDDC) market. According to MarketsandMarkets, the global SDDC market size in 2020 was USD 43.7 B and is expected to have a CAGR of 22.4% until 2025 and reach USD 120.3 B. The expected increase is due to the cost reduction in hardware when a company switches to a software-defined data center to manage its resources.

The As-a-Service SDDC Market Size is estimated as the multiplication of (i) SDDC market size and (ii) As-a-service percentage from the worldwide cloud outlook (55% in 2020 according to IDC). At last, the subscription and SaaS revenues are estimated as the multiplication of (i) As-a-Service Infrastructure Software Market Size and (ii) the market share of VMware (10.8% for FY21). The SDDC market growth is expected to gradually decrease to 3.1% from FY27 to FY30 and the market share of VMware is also expected to decrease from 10.76% in FY21 to 7.72% in FY26 since the overall sector is expected to increase significantly and new players are expected to acquire part of the SDDC market thus, a decrease in the market share for the overall market is expected. Figure 22 below exhibits the subscription and SaaS revenues during the forecast period.

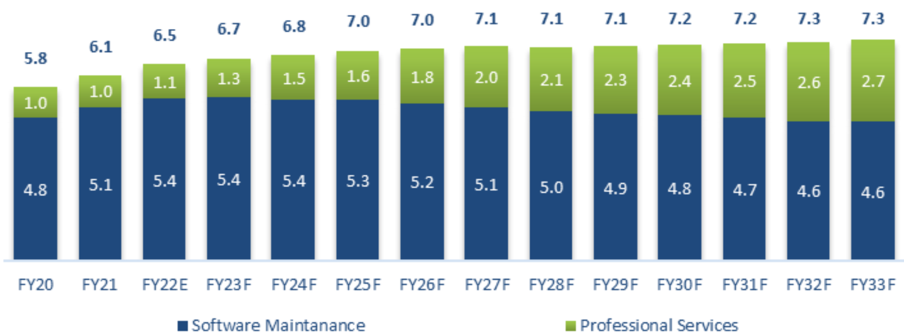
Figure 22. VMware Subscription/ SaaS Revenue Forecast (USD B)



Source: VMware Financial Statements, IDC, Markets and Markets, Own Projections

As mentioned before, the Services revenues are forecasted using a bottom-up approach and this revenue is divided into (i) Software maintenance and (ii) professional services. For the FY21, Software maintenance represents 83% of total service revenues and professional services the remaining 17%. The professional services depend on the number of licenses and subscriptions; thus, this item is projected as a percentage of the combined revenues of subscriptions and licenses. On the other hand, software maintenance entitles customers to receive major and minor program updates and technical support and they depend on the number of licenses; thus, the growth rate is expected to be the average growth of the last three years from the licenses revenues since the average contract for support services is approx. 3 years. Overall, services revenues are projected to have a CAGR of 3.14% from FY21 to FY31. Figure 23 below exhibits the Services revenues during the forecast period.

Figure 23. VMware Services Revenue Forecast (USD B)

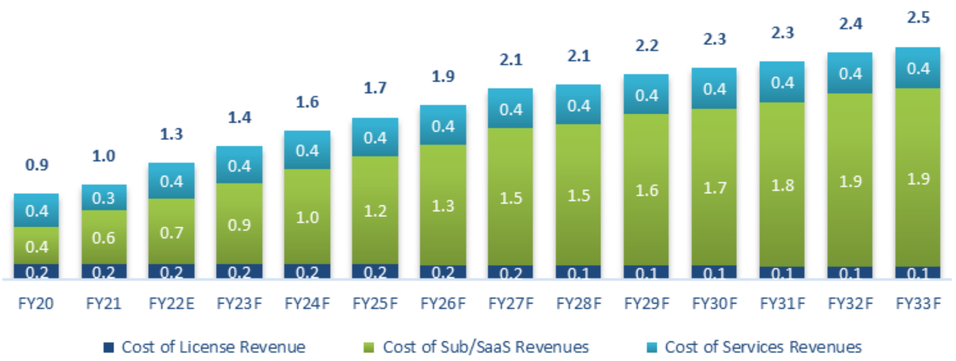


Source: VMware Financial Statements, Own Projections

Cost

The cost of Licenses, Subscription & SaaS, and Services are projected and estimated as the average percentage over revenues of the last three years corresponding to 5.2%, 21.8%, and 6.0% respectively (Figure 24).

Figure 24. VMware Cost of Goods Sold Forecast (USD B)



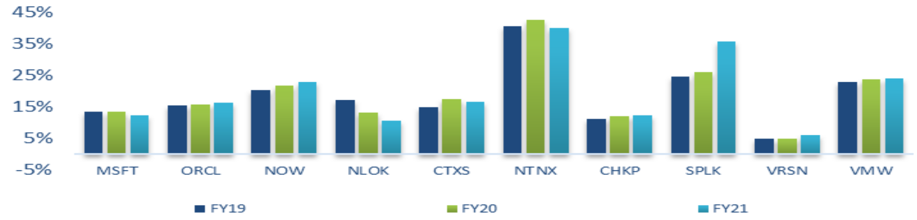
Source: VMware Financial Statements, Own Projections

Expenses

The expenses of the company are (i) Research and Development (R&D), (ii) Sales and Marketing, (iii) General and administrative (G&A), and (iv) Depreciation and Amortization (D&A).

R&D expenses have been on average 23.4% of sales for the last three years which reinforced the bold new vision of VMware software-defined data centers. Considering that the company has been developing new products and transitioning to a different business model, the R&D expenses in the last years were significantly higher than the average of its peer competitors of 17.21% (see Figure 25). Because of this, R&D expenses in the first projected years are expected to be higher than the industry average due to the transition to the SaaS delivery model; consequently, The R&D expenses are expected to stay constant until FY23, and then they are projected to gradually decrease to the industry average of 17.2% on FY31.

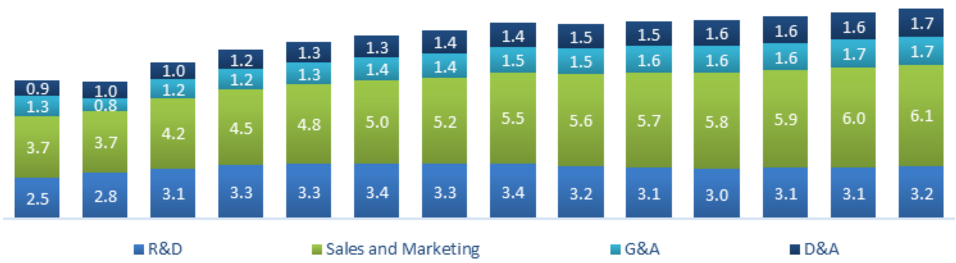
Figure 25. R&D Expenditure as % of Total Revenues



Source: Financial Statements

On the other hand, expenses of sales and marketing and G&A are on average 33.0% and 9.1% respectively from total revenues (in the past three years). These items are forecasted as a percentage of revenues during the projected period. Finally, the D&A is forecasted considering the value of depreciation and amortizations of the current period over the value of the PP&E of the previous period and the average of this value for the last two years corresponds to 77.6% and is expected to be constant during the forecast period. Do note that the financial statements of the company don´t provide enough information to estimate depreciation forecast based on equipment purchases and depreciation schedules. (figure 26).

Figure 26. Costs Forecast (B USD)



Source: VMware Financial Statements, Own Projections

Interest

The interest expenses were USD 149 M and USD 204 M in FY20 and FY21, respectively. The interest expenses are based on two series of senior unsecured notes issued in August 2017 and three series of unsecured senior notes issued in April 2020. The notes issued in August have maturity on 2022 and 2027 with an interest of 2.95% and 3.9% respectively and principal of USD 1,500 and 1,250 M. On the other hand, the senior notes issued in April 2020 have maturity on 2025, 2027 and, 2030 with an interest rate of 4.5%, 4.65%, and 4.7% respectively with a principal amount of USD 750, 500, and 750 M. The total principal amount is USD 4,717 M. Considering that the proper driver for interest expenses is total debt, the forecast of this item will depend on the total debt of the previous year (which is estimated considering the capital structure of the WACC assumptions in the forecast balance sheet) multiplied by the cost of debt (forward-looking estimate), corresponding to 2.17% (see the cost of debt estimation section) during the forecast period. Do note that since the DCF valuation method doesn´t include interest expenses in the cashflows but on the WACC these projected interest expenses do not impact the valuation, nevertheless they are estimated and forecasted to maintain credibility and consistency in the model.

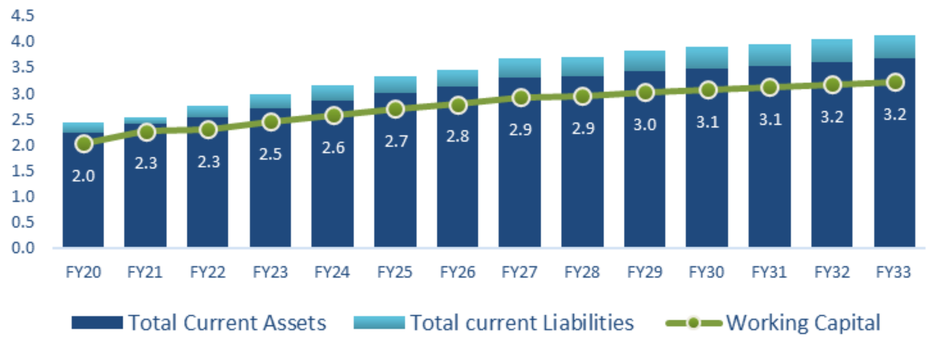
Non-core operations

- **Investment income:** VMWare currently holds an investment portfolio that includes non-US financial instruments and non-US financial institutions. The value driver for the forecast of this account is the prior year's excess cash. The average investment income over the excess cash of the last three years corresponds to 20.4% and it is projected to stay constant during the forecast period, while the excess cash varies as a function of the total invested capital, financial debt, and equity.
- **Other income/expenses & Realignment:** Other income/Expenses for FY21 come from the unrealized gain in the initial public offering of equity securities of USD 163 M. Any volatility in the trading stock introduces a degree of volatility to the income statement of VMware, thus it is assumed that the account would remain constant at USD 92 M during the forecast period which is the average returns in the last three years. On the other hand, the realignment expense of USD 42 M in FY21 was due to VMware's plan to streamline its operations and better align its resources. In such a plan, there were structural changes, like eliminating 280 positions, and the actions of this plan were substantially completed by the end of FY21, thus the forecast of this account is zero for the forecast period.

Working Capital

The accounts considered in the estimation of the working capital are the following: (i) accounts receivable, (ii) other current assets, and (iii) accounts payable. Accounts receivable are forecasted using the average collection period of the last three years corresponding to 59 days during the forecast period and rotating the account over revenues. Similarly, other current assets are also forecasted with the average of other current assets period which corresponds to 12 days during the forecast period, and it is rotated over revenues. Finally, the accounts payable are forecast by using the average payable period of the last three years, corresponding to 65 days, and rotating this account over total costs. Figure 27 below presents the estimation of the working capital.

Figure 27. VMware Working Capital Forecast (B USD)



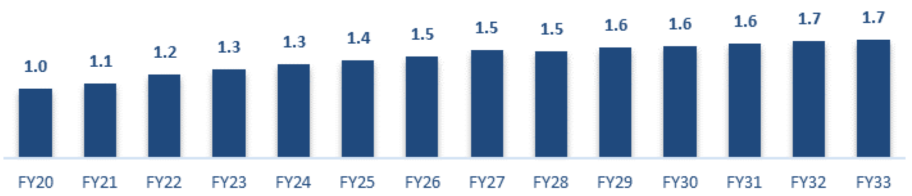
Source: Own Calculations

The working capital requirements as a percentage of revenues are expected to be around 18% during the forecast period. Do note that the non-cash working capital/sales of the software (system & application) according to Damodaran is 13.15%.

Capex

The forecast of the property plant and equipment is done as a percentage of revenues. PP&E include: (i) Equipment and software, (ii) Buildings and improvements (iii) furniture and fixtures, and (iv) construction in progress. The average PP&E over sales of the last three years correspond to 11.8% and is it projected to stay at this level for the forecast period. As mentioned before, the D&A is forecasted considering the prior year PP&E and they are on average 8.8% of total sales during the forecast period. The estimation of the CAPEX is estimated as the variation of PP&E plus the D&A. Figure 28 shows the CAPEX projection. The CAPEX corresponds to approximately 9.1% of total revenues during the forecasted period.

Figure 28. VMware's CAPEX forecast.



Source: Own Projection

DCF Valuation

The valuation of VMware is done by a discounted free cash flow (DCF) model using the weighted average cost of capital as a discount rate in US dollars. The valuation date of reference is January 2023, thus the first cash flow to be considered is FY23. Do note that the fiscal years ended January 29, 2021, January 31, 2020, February 1, 2019, and February 2, 2018, are referred to as fiscal 2021, fiscal 2020, fiscal 2019, and fiscal 2018 respectively. Is important to highlight that the company faced a spinoff from Dell Technologies, and it paid a special dividend of USD 11.5 B to Dell Technologies in FY22. Because of this, VMware increased its total debt by USD 6 B through bond issuance, USD 4 B of additional borrowings from term licenses commitments, and USD 1.5 B with cash on hand. The reason why the applied methodology is enterprise DCF instead of adjusted present value even though both reach the same result is that even though the company is facing strong changes in its capital structure "by calculating unleveraged free cash flow, as if the company was entirely financed with equity, one can compare operative performance across industries and companies regardless of capital structure and this can lead to better forecast and performance measures"(Koller, Goedhart, Wessels, p.148). Moreover, considering that the software industry is not heavily dependent on invested capital (tangible assets) indicators such as the RONIC are not accurate performance measures, therefore, having unleveraged cash flows can help assess more accurately the past and future performance of the company across companies and industries. Do note that the cost of capital (WACC) is estimated for each forecast period, and its change is a function of the target D/E ratio and macroeconomic variables.

Discount rate

For the estimation of the cost of capital (WACC) the CAPM (with country risk) was used with the following parameters:

Risk-free (1.48%): Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity.

Equity Risk Premium (6.43%): Arithmetic Average from the spread between Stocks returns (S&P 500) and T.Bonds from 1928 to 2020 (Source Damodaran).

Tax Rate (21%): Statutory tax rate of the United States.

Unlevered beta (0.74): Average unleveraged beta from peer comparable (see multiple valuation for more detail on the peers). The unlevered betas were estimated by linear regression of the returns of each peer company versus the

MSCI world index (MXWO), and afterwards deleveraging the obtained betas with the D/E ratio of each company. Moreover, the assumptions considered were that the beta of the tax shield is equal to the unleveraged asset beta and that the company is targeting a D/E ratio. The fundamental reason why the unleveraged beta is estimated using its peers is that the regression of VMware returns over the MSCI world index returns, gives a wide 95% confidence interval for the beta (0.817 and 1.316, with a P-value of zero), thus using peers to estimate the beta minimize statistical error.

D/E ratio: This value changes every period until FY29 in which the company reaches the target D/E ratio of 18.1%, which corresponds to the peer comparable average. The values in the first years were estimated using the book value of net debt and the market value of equity. The D/E is assumed to gradually decrease for six years until reaching stability. The company had declared that it would deleverage to this value in two years, nevertheless, the company guidance is not taken at face value, and considering that the increased its debt by USD 10 B in FY22 to finance the dividend payment to Dell Technologies of USD 11.5 B the model extent the deleveraging time to six years.

Figure 29. VMware Country Risk Calculation

VMWare Country Risk	Weighted Average: CRP	Weight (By Revenues)
Africa	4.9%	2%
Asia	1.0%	18%
Australia & New Zealand	0.0%	3%
Caribbean	5.3%	1%
Central and South America	4.0%	1%
Eastern Europe & Russia	2.1%	2%
Middle East	1.5%	2%
North America	0.0%	53%
Western Europe	0.8%	18%

Source: Damodaran country risk by region.

Country Risk: VMware has operations in all different continents thus assuming that the country risk of the company is zero because its headquarters are in Palo Alto, California is inaccurate and unrealistic. A simple approach in which the overall country risk of VMware can be estimated is by dividing the revenues of the company by the following regions: Africa, Asia, Australia & New Zealand, Caribbean, central and south America, Eastern Europe and Russia, Middle East, North America, and Western Europe. Afterward, using Damodaran country risk by region, which is estimated using default spreads from traded country bonds and default-free government bonds or with credit default swaps, and using the revenues by regions as weights is possible to calculate a weighted average country risk of the company. The table shows the country risk by region with its corresponding weights. The estimated total country risk on the company is 0.6% which is added to the cost of equity (Figure 29). The estimation of country risk is pragmatic and there are several ways to estimate it. Exposure to country risk should not be determined by where the company is trading but by a company's operations, which makes its estimation a critical component of the valuation of almost all multinational corporations. (Damodaran Country Risk: Determinants, Measures and Implications, 2020)

Figure 30. VMware Cost of Debt Calculation

Cost of debt		
USD million		
VMW 2.2 08/15/31 Corp		
Date today		12/7/2021
Par Value of Bond	$	100.00
Coupon rate (annual)		2.2%
Coupons per year		2
Maturity		8/15/2031
Years to maturity		900.0%
Current price of bond	$	98.05
Rating Moody's		Baa3
Yield to Maturity		**2.4%**
Probability of Default		0.5%
LGD		54.0%
Cost of Debt		**2.17%**

Source: Bloomberg, 2021

Cost of debt (2.17%): The cost of debt was calculated using forward-looking estimations. Since the company has a credit rating of Baa3 according to Moody's, the probability of default multiplied by the loss given default was subtracted from the yield to maturity of VMware bond with the longest time to maturity (Figure 30). Do note that the probability of default was taken from "Corporate Defaults and Recovery Rates, 1920-2011, "Moody's Global Credit Policy", Feb 2012.

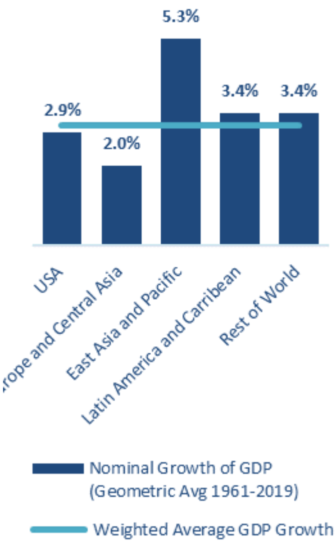
Perpetuity

The perpetuity is applied when the cash flows and long-term indicators (g, ROIC, and economic profit over revenues) are in a steady-state growth (a steady state is reached in FY33). Do note that the present value of the perpetuity is 71% of the total enterprise value of the company. To maintain consistency with the financial statements projections the following formula was applied to estimate the perpetuity:

$$\text{Value} = \frac{\text{NOPLAT}_{t=1}\left(1 - \frac{g}{\text{ROIC}}\right)}{\text{WACC} - g}$$

Considering that in the software industry the RONIC is not an accurate estimator of performance and value creation, it is assumed that the ROIC and RONIC converge to the same value in the perpetuity, thus the previous formula is applied. The projected ROIC of VMware from FY25 to FY33 is approximately 25% while, according to Damodaran, the ROIC of the software (System & Application) industry is 22.8%. Additionally, the unleveraged free cash flows growth rate is lower than the expected g in perpetuity in all scenarios, thus the company does not grow faster that the economy in perpetuity, and the economic profit over revenues stabilize in FY30 to FY33 at approximately 18.5%.

Figure 31.
VMware's Perpetuity Gradient



Source: Bloomberg

Growth Gradient in Perpetuity

The estimated gradient is 3.1% and is estimated by the weighted average of VMware's revenues by region and the nominal growth of GDP (Geometric Avg 1961-2019) (Figure 31).

Adjustments to Equity value

The projected debt of the company for FY23 (Dec 2022) is USD 14.3 B and with excess cash of USD 275 M for a total net debt of USD 14.1 B. This amount was subtracted from the EV to estimate the value of equity and price per share. Do note that the forecast of debt on the balance sheet was estimated following the D/E assumptions made on the WACC. In more detail, the model estimates the EV for each forecasted year, and the future debt is a percentage of that EV (the same percentage that is considered in the WACC). This implies that: (i) the total equity is estimated by the difference between the invested capital and the forecast debt, and (ii) the payout ratio and transactions with shareholders are an output of the model (instead of an input).

Equity Value and Price per Share

The output of the DCF valuation gives an enterprise value of USD 78,605 B and an equity value of USD 64,506 B. Considering VMware has 419.7 M shares outstanding, the implicit share price of the company is USD 154 per share.

Multiple Valuation

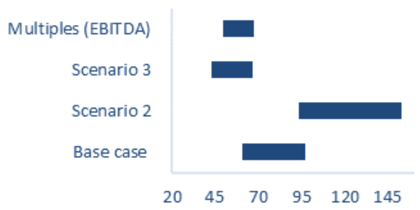
The companies selected for the relative valuation approach were companies in the same industry and with comparable business models (at least in one core business unit). The companies are the following:

- **Microsoft (NasdaqGS: MSFT)**: Develops, licenses, and supports software, services, devices, and solutions worldwide.
- **Oracle Corporation (NYSE: ORCL):** Computer Programming, Data Processing, And Other Computer Related Services
- **ServiceNow, Inc. (NYSE: NOW):** Provides enterprise cloud computing solutions that define, structure, consolidate, manage, and automate services for enterprises worldwide.
- **NortonLifeLock Inc. (NasdaqGS: NLOK):** Provides cyber safety solutions for consumers worldwide.
- **Citrix Systems, Inc. (NasdaqGS: CTXS):** Enterprise software company, provides workspace, app delivery and security, and professional services worldwide.

The selected multiples for the valuation are EV/EBITDA and P/E ratio. The average EV/EBITDA is **19.7x** and a median of **19.6x** (Service now has an EV/EBITDA multiple of **159.8x** thus is an outlier so it is excluded from the EV/EBITDA sample). On the other hand, for the P/E ratio, multiple one company presents negative earnings (ServiceNow In) thus its implicit P/E multiple is not considered. For the remaining companies, the average P/E ratio is **27.3x** with a median of **25.1x**. Considering that the EBITDA of VMware in FY21 is USD 3,413 M and its earnings per share is USD 4.86 the relative valuation set the enterprise value of VMware between USD 49,120 B (EBITDA multiple) and USD 46,075 billion (P/E multiple).

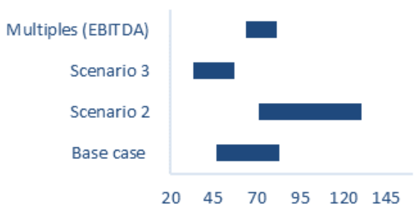
Scenario & Sensitivity Analysis

Figure 32.
VMware Enterprise Value Valuation (B USD)



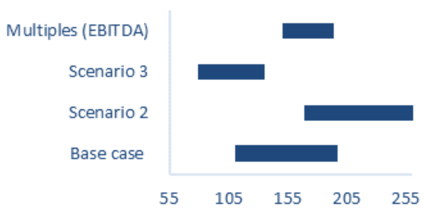
Source: Own Calculations

Figure 33.
VMware Equity Value Valuation (B USD)



Source: Own Calculations

Figure 34.
VMware Price per Share Valuation (USD)



The following scenarios were considered: (i) Base case (ii) Scenario 2 (optimistic) and (iii) Scenario 3 (pessimistic). The difference between the three scenarios comes from the sales and cost drivers. The base case refers to the scenario that was referenced in the previous sections. Scenario 2 considered a lower R&D expense and a constant market share for the sub/SaaS sector while Scenario 3 considered the highest R&D expenses and a gradual decrease in the market share of the Sub/SaaS sector.
The output of the scenario analysis for the enterprise value, equity value, and price per share are shown in Figures 32, 33, and 34.

For the Sensitivity analysis, was considered a WACC of (+/-) 1% with 0.5% intervals and a growth rate of (+/-) 1.5% with 0.5% intervals. The results are shown in Appendix 5.

Overall Output and Investment Recommendation

Figure 32, 33, and 34 present the overall output of the model, which considers the different scenarios and valuation methodologies. The suggested price range of the stock is (USD 131 to 196) which comes from estimating the median of the minimum output scenarios (131) and the median of the maximum output scenarios (196) as shown in figures 32, 33, and 34. Thus, the expected price of VMware in December 2022 is 163 (average and median of such values). Considering that the stock price as of (17/12/2021) is USD 114.7 per share, the expected capital gain for an investor that purchases the stock on (17/12/2021) and sells it on 31/12/2021 is 42.3%, which implies a strong buy and hold position, since the expected return is approximately 3.5x higher than the expected return of the S&P 500.

Appendix

Appendix 1 - Income Statement

Income Statement Forecast														
USD M	**FY20**	**FY21**	**FY22E**	**FY23F**	**FY24F**	**FY25F**	**FY26F**	**FY27F**	**FY28F**	**FY29F**	**FY30F**	**FY31F**	**FY32F**	**FY33F**
CORE														
Total Revenues	**10,811**	**11,767**	**12,823**	**13,744**	**14,508**	**15,251**	**15,818**	**16,705**	**16,818**	**17,335**	**17,626**	**17,915**	**18,287**	**18,603**
License Revenues	3,181	3,033	3,108	3,067	3,007	2,928	2,831	2,794	2,770	2,725	2,660	2,592	2,437	2,425
Sub/SaaS Revenues	1,877	2,587	3,196	3,963	4,684	5,351	5,955	6,775	6,974	7,473	7,789	8,117	8,585	8,850
Services Revenues	5,753	6,147	6,519	6,714	6,817	6,972	7,032	7,136	7,074	7,138	7,177	7,207	7,265	7,329
Total Cost of Revenues	(926)	(1,018)	(1,258)	(1,435)	(1,596)	(1,747)	(1,877)	(2,060)	(2,099)	(2,209)	(2,277)	(2,347)	(2,444)	(2,506)
Gross Profit	**9,885**	**10,749**	**11,564**	**12,308**	**12,912**	**13,504**	**13,941**	**14,644**	**14,719**	**15,126**	**15,348**	**15,568**	**15,843**	**16,098**
R&D	(2,522)	(2,816)	(3,069)	(3,289)	(3,333)	(3,357)	(3,330)	(3,356)	(3,217)	(3,150)	(3,033)	(3,083)	(3,147)	(3,202)
Sales and Marketing	(3,677)	(3,711)	(4,238)	(4,542)	(4,795)	(5,040)	(5,228)	(5,521)	(5,558)	(5,729)	(5,825)	(5,921)	(6,044)	(6,148)
G&A	(1,293)	(767)	(1,166)	(1,250)	(1,319)	(1,387)	(1,438)	(1,519)	(1,529)	(1,576)	(1,603)	(1,629)	(1,663)	(1,692)
EBITDA	**2,393**	**3,455**	**3,092**	**3,227**	**3,465**	**3,720**	**3,945**	**4,248**	**4,414**	**4,671**	**4,887**	**4,935**	**4,989**	**5,056**
D&A	(873)	(1,025)	(1,035)	(1,170)	(1,254)	(1,323)	(1,391)	(1,443)	(1,524)	(1,534)	(1,581)	(1,608)	(1,634)	(1,668)
EBIT	**1,520**	**2,430**	**2,057**	**2,058**	**2,211**	**2,397**	**2,554**	**2,805**	**2,890**	**3,136**	**3,306**	**3,327**	**3,355**	**3,388**
Statutory Tax	(319)	(510)	(432)	(432)	(464)	(503)	(536)	(589)	(607)	(659)	(694)	(699)	(704)	(711)
Tax Adjustment	(239)	(239)	(239)	(239)	(239)	(239)	(239)	(239)	(239)	(239)	(239)	(239)	(239)	(239)
Total Core	**962**	**1,681**	**1,386**	**1,386**	**1,508**	**1,654**	**1,778**	**1,977**	**2,044**	**2,239**	**2,373**	**2,390**	**2,411**	**2,438**
NON CORE														
Non-Core result before taxes	**67**	**156**	**226**	**92**	**92**	**92**	**92**	**92**	**92**	**92**	**92**	**92**	**92**	**92**
Non core result	**5,566**	**537**	**630**	**557**	**584**	**610**	**630**	**661**	**665**	**683**	**694**	**704**	**717**	**728**
FINANCIAL														
Interest expense	(149)	(204)	(102)	(321)	(288)	(285)	(282)	(278)	(272)	(266)	(272)	(280)	(288)	(297)
Financial result before taxes	**(149)**	**(204)**	**(102)**	**(321)**	**(288)**	**(285)**	**(282)**	**(278)**	**(272)**	**(266)**	**(272)**	**(280)**	**(288)**	**(297)**
Statutory Tax rate	31	43	22	67	60	60	59	58	57	56	57	59	61	62
Tax adjustment	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Financial result	**(118)**	**(161)**	**(81)**	**(253)**	**(227)**	**(225)**	**(223)**	**(219)**	**(215)**	**(210)**	**(215)**	**(221)**	**(228)**	**(235)**
CONSOLIDATED														
Core Result	962	1,681	1,386	1,386	1,508	1,654	1,778	1,977	2,044	2,239	2,373	2,390	2,411	2,438
Non core result	5,566	537	630	557	584	610	630	661	665	683	694	704	717	728
Financial	(118)	(161)	(81)	(253)	(227)	(225)	(223)	(219)	(215)	(210)	(215)	(221)	(228)	(235)
Total comprehensive income	**6,410**	**2,057**	**1,935**	**1,690**	**1,865**	**2,039**	**2,186**	**2,419**	**2,495**	**2,712**	**2,851**	**2,872**	**2,900**	**2,931**

Appendix 2 – Balance Sheet

Balance Sheet Forecast														
USD M	**FY20**	**FY21**	**FY22E**	**FY23F**	**FY24F**	**FY25F**	**FY26F**	**FY27F**	**FY28F**	**FY29F**	**FY30F**	**FY31F**	**FY32F**	**FY33F**
CORE														
Operating cash	216	235	256	275	290	305	316	334	336	347	353	358	366	372
Restricted cash	116	78	103	110	116	122	127	134	135	139	141	143	146	149
Accounts receivable, net of allowance of $5 and $7	1,883	1,929	2,102	2,253	2,378	2,500	2,593	2,738	2,757	2,842	2,889	2,937	2,998	3,050
Due from related parties, net	1,457	1,438	1,583	1,697	1,791	1,883	1,953	2,062	2,076	2,140	2,176	2,212	2,258	2,297
Other current assets	353	474	432	463	489	514	533	563	566	584	594	603	616	626
Deferred commissions	938	1,100	1,199	1,285	1,356	1,426	1,479	1,562	1,572	1,621	1,648	1,675	1,710	1,739
Deferred tax assets	5,556	5,781	6,194	6,624	6,966	7,296	7,545	7,935	7,980	8,198	8,317	8,451	8,621	8,766
Other long-term assets	250	310	347	382	412	437	455	468	482	497	512	527	543	559
Property and equipment, net	1,280	1,334	1,507	1,616	1,705	1,793	1,859	1,964	1,977	2,038	2,072	2,106	2,150	2,187
Intangible assets, net	1,172	993	993	993	993	993	993	993	993	993	993	993	993	993
Goodwill	9,329	9,599	9,599	9,599	9,599	9,599	9,599	9,599	9,599	9,599	9,599	9,599	9,599	9,599
ROU assets	886	997	1,127	1,207	1,275	1,340	1,390	1,468	1,477	1,523	1,548	1,574	1,607	1,634
Accrued expenses and other	(2,151)	(2,382)	(2,512)	(2,727)	(2,869)	(2,999)	(3,095)	(3,243)	(3,249)	(3,313)	(3,341)	(3,404)	(3,484)	(3,550)
Unearned revenue	(9,268)	(10,314)	(11,239)	(12,047)	(12,716)	(13,368)	(13,865)	(14,642)	(14,741)	(15,195)	(15,449)	(15,703)	(16,029)	(16,306)
Customer deposits (prepayment and cloud credit)	(143)	(163)	(142)	(153)	(161)	(169)	(176)	(186)	(187)	(193)	(196)	(199)	(203)	(207)
Accounts payable	(208)	(131)	(226)	(258)	(287)	(314)	(337)	(370)	(377)	(397)	(409)	(421)	(439)	(450)
Income tax payable	(817)	(805)	(805)	(805)	(805)	(805)	(805)	(805)	(805)	(805)	(805)	(805)	(805)	(805)
Other long-term liabilities	(133)	(182)	(187)	(193)	(198)	(204)	(210)	(216)	(222)	(228)	(235)	(242)	(249)	(256)
Deferred tax liabilities	(16)	(60)	69	70	71	73	74	75	77	78	79	81	82	84
Invested Capital Core Business	**10,700**	**10,231**	**10,399**	**10,392**	**10,406**	**10,420**	**10,428**	**10,433**	**10,447**	**10,467**	**10,486**	**10,485**	**10,479**	**10,481**
NON-CORE														
Invested Capital Non-Core Business	**2,461**	**4,093**	**4,913**	**5,384**	**5,654**	**5,781**	**5,912**	**6,046**	**6,185**	**6,327**	**6,473**	**6,623**	**6,778**	**6,937**
TOTAL INVESTED CAPITAL	**13,161**	**14,324**	**15,312**	**15,776**	**16,060**	**16,202**	**16,340**	**16,480**	**16,631**	**16,794**	**16,959**	**17,108**	**17,257**	**17,418**
FINANCIAL														
Excess cash	(397)	(655)	-	-	-	-	-	-	-	-	-	-	-	-
Current portion of long-term debt and other borrowings	2,747	-	-	-	-	-	-	-	-	-	-	-	-	-
Note payable to Dell	270	270	-	-	-	-	-	-	-	-	-	-	-	-
Long-term debt	2,731	4,717	14,764	13,235	13,139	12,978	12,781	12,510	12,242	12,512	12,893	13,276	13,667	14,083
Finance lease liabilities, non-current	55	50	56	61	64	67	70	74	74	76	78	79	81	82
Operating lease liabilities	746	891	1,007	1,079	1,139	1,197	1,242	1,312	1,320	1,361	1,384	1,407	1,436	1,461
Financial Debt	**6,549**	**5,928**	**15,827**	**14,374**	**14,342**	**14,242**	**14,093**	**13,895**	**13,636**	**13,950**	**14,355**	**14,761**	**15,184**	**15,625**
Net Financial Debt	**6,152**	**5,273**	**15,827**	**14,374**	**14,342**	**14,242**	**14,093**	**13,895**	**13,636**	**13,950**	**14,355**	**14,761**	**15,184**	**15,625**
Equity	**7,009**	**9,051**	**(514)**	**1,402**	**1,718**	**1,959**	**2,247**	**2,585**	**2,995**	**2,844**	**2,604**	**2,347**	**2,073**	**1,793**
	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Appendix 3 – Cash Flow Map

Cash Flow Map													
USD million	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**FY33**
CORE													
Core Result	1,681	1,386	1,386	1,508	1,654	1,778	1,977	2,044	2,239	2,373	2,390	2,411	2,438
Change in Invested Capital	(469)	168	(7)	14	14	8	5	13	20	19	(1)	(6)	2
Core FCF	**2,150**	**1,218**	**1,393**	**1,494**	**1,640**	**1,771**	**1,972**	**2,031**	**2,218**	**2,353**	**2,391**	**2,417**	**2,435**
NON CORE													
Core Result	537	630	557	584	610	630	661	665	683	694	704	717	728
Change in Invested Capital	1,632	820	471	270	127	131	134	138	142	146	150	155	159
FCF Non Core		**(190)**	**86**	**314**	**482**	**499**	**527**	**527**	**541**	**548**	**554**	**562**	**569**
Total FCF		**1,028**	**1,479**	**1,808**	**2,123**	**2,270**	**2,499**	**2,558**	**2,760**	**2,901**	**2,945**	**2,979**	**3,004**

Financing Cash Flow													
USD million	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**FY33**
Financial result	(161)	(81)	(253)	(227)	(225)	(223)	(219)	(215)	(210)	(215)	(221)	(228)	(235)
Change in Net debt		10,553	(1,452)	(33)	(100)	(149)	(198)	(259)	314	405	406	423	442
Change in Equity & CI		(11,500)	227	(1,548)	(1,798)	(1,898)	(2,082)	(2,084)	(2,863)	(3,091)	(3,130)	(3,174)	(3,211)
Financial FCF		**(1,028)**	**(1,479)**	**(1,808)**	**(2,123)**	**(2,270)**	**(2,499)**	**(2,558)**	**(2,760)**	**(2,901)**	**(2,945)**	**(2,979)**	**(3,004)**

Appendix 4 – Valuation

Discount Cash Flows												
million USD	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**FY31**	**FY32**	**FY33**	**Steady State**
Core Result	1,386	1,508	1,654	1,778	1,977	2,044	2,239	2,373	2,390	2,411	2,438	
Change in Core Invested Capital	(7)	14	14	8	5	13	20	19	(1)	(6)	2	
FCF	1,393	1,494	1,640	1,771	1,972	2,031	2,218	2,353	2,391	2,417	2,435	2,426
Discount period	-	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	
Discount rate	5.55%	5.56%	5.57%	5.57%	5.58%	5.59%	5.59%	5.59%	5.59%	5.59%	5.59%	
Discount Factor	1.00	0.95	0.90	0.85	0.80	0.76	0.72	0.68	0.65	0.61	0.58	
Discounted Cash Flows	**1,393**	**1,415**	**1,472**	**1,505**	**1,587**	**1,548**	**1,601**	**1,609**	**1,548**	**1,482**	**1,414**	

Sum Discounted Cash Flows	16,573
Perpetuity	
Nomalized cash flows	2,426
Discount rate	5.6%
g	3.09%
Perpetuity	97,097
Discount Factor	0.58
Present Value Perpetuity	56,378
Total PV DCF	72,952
Non-Core Book value	5,654
Enterprise value	78,605
Net Debt	(14,100)
Equity value	64,506
Value per share	154

Appendix 4 – WACC

Ke estimation	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	Source
risk free rate	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity
Equity risk premium	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	Arithmetic Average from the spread between Stocks returns (S&P 500) and T.Bonds from 1928 to 2020
Unlevered Beta	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	Peer comparable companies (see Appendix and beta sheet)
Tax rate	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	Statutory tax rate United States
D/E	23.4%	22.5%	21.4%	20.4%	19.4%	18.4%	17.3%	17.2%	17.2%	17.2%	17.2%	17.2%	Peer comparable companies & Vmware D/V target
Leverage Beta	0.89	0.88	0.87	0.87	0.86	0.85	0.85	0.85	0.85	0.85	0.85	0.85	Calculations
Country Risk	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	Damodaran Country Risk by Region & Vmware Revenues by Region
CAPM (nominal USD)	**6.44%**	**6.42%**	**6.39%**	**6.35%**	**6.32%**	**6.29%**	**6.26%**	**6.25%**	**6.25%**	**6.25%**	**6.25%**	**6.25%**	**Calculations**

Cost of debt	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	Source
cost of debt (pre tax)	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	VMWare financial statments (carrying values of senior notes January 29 2021)
Tax rate	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	Statutory tax rate United States
Debt Beta	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	Implied Debt beta
Cost of debt (post tax)	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**1.7%**	**Calculations**

Capital structure	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	Source
% Debt	18.9%	18.3%	17.7%	17.0%	16.2%	15.5%	14.8%	14.7%	14.7%	14.7%	14.7%	14.7%	Vmware D/E goal
% Equity	81.1%	81.7%	82.3%	83.0%	83.8%	84.5%	85.2%	85.3%	85.3%	85.3%	85.3%	85.3%	Vmware D/E goal
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	

WACC	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	Source
% Equity	81.1%	81.7%	82.3%	83.0%	83.8%	84.5%	85.2%	85.3%	85.3%	85.3%	85.3%	85.3%	Vmware D/E goal
CAPM (nominal USD)	6.4%	6.4%	6.4%	6.4%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	6.3%	Calculations
% Debt	18.9%	18.3%	17.7%	17.0%	16.2%	15.5%	14.8%	14.7%	14.7%	14.7%	14.7%	14.7%	Vmware D/E goal
Cost of debt (post tax)	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%	Calculations
WACC (nominal USD)	**5.55%**	**5.55%**	**5.56%**	**5.57%**	**5.57%**	**5.58%**	**5.59%**	**5.59%**	**5.59%**	**5.59%**	**5.59%**	**5.59%**	**Calculations**

Appendix 5 – Sensitivity Analysis

Sensitivity EV (M USD)

WACC		4.57%	5.07%	5.58%	6.07%	6.57%
	1.59%	75,023	65,074	57,570	51,839	47,216
	2.09%	85,479	72,183	62,634	55,602	50,086
	2.59%	101,204	82,152	69,393	60,446	53,677
g	3.09%	127,520	97,144	78,867	66,912	58,297
	3.59%	180,558	122,234	93,104	75,980	64,466
	4.09%	343,005	172,801	116,904	89,617	73,118
	4.59%	-10,157,265	327,682	164,768	112,440	86,129

Sensitivity Equity Value (M USD)

WACC		4.57%	5.07%	5.58%	6.07%	6.57%
	1.59%	60,923	50,975	43,471	37,739	33,116
	2.09%	71,380	58,083	48,535	41,503	35,987
	2.59%	87,105	68,052	55,294	46,346	39,577
g	3.09%	113,420	83,045	64,768	52,812	44,198
	3.59%	166,458	108,134	79,005	61,881	50,367
	4.09%	328,906	158,702	102,804	75,518	59,019
	4.59%	-10,171,365	313,583	150,669	98,340	72,030

Sensitivity Price per Share

WACC		4.57%	5.07%	5.58%	6.07%	6.57%
	1.59%	145	121	104	90	79
	2.09%	170	138	116	99	86
	2.59%	208	162	132	110	94
g	3.09%	270	198	154	126	105
	3.59%	397	258	188	147	120
	4.09%	784	378	245	180	141
	4.59%	-24,237	747	359	234	172

Appendix 6 – Multiples valuation

Multiples Valuation (EV/EBITDA)

USD Million	**Min**	**Median**	**Average**
Vmware EBITDA (FY21)	3,413	3,413	3,413
EV/EBITDA multiple	14.4x	19.6x	19.7x
Implicit EV	49,120	66,753	67,272
Net Debt	-14,100	-14,100	-14,100
Equity Value	63,219	80,853	81,372
Shares outstanding (million)	420	420	420
Price per Share	**150.6**	**192.7**	**193.9**

Multiples Valuation (P/E)

USD Million	
VM WARE Earnings	4.86
P/E miltiple	27.3x
Implicit Price per share	133
Shares outstanding (million)	420
Implicit Equity Value	55,771
Net Debt	-14,100
Implicit EV	**41,671**

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Report Recommendations

Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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References

451 Research. (2021). *Market Insight Report Reprint VMware Tanzu Application Platform: Turning developer definition into a running Kubernetes pod.* S&P Global Market Intelligence,.

Aenlle, C. d. (2021, October 12). *Economic and Earnings Concerns Begin to Weigh on Stocks*. Retrieved from The New York Times: https://www.nytimes.com/2021/10/08/business/mutfund/fed-markets-stocks.html

Boyd, A. (2021, May 28). *The request would add another $500 million to the Technology Modernization Fund*. Retrieved from Nextgov: https://www.nextgov.com/cio-briefing/2021/05/biden-budget-boosts-federal-it-spending/174387/

Canals, C., & Baquer, O. C. (2021). *The digital policies of Next Generation EU.* Caixa Bank Research.

CSO. (2021). *Global Intelligence Report: State of Cybersecurity 2021.* IDG Communications.

Damodoran, A. (2020). Country Eisk: Determinants, Measures and Implications. *NYU Stern School of Business.* http://dx.doi.org/10.2139/ssrn.3653512

Depeyrot, T., & Heap, S. (2018, December 20). *Hacking Software's Rule of 40*. Retrieved from Bain & Company: https://www.bain.com/insights/hacking-softwares-rule-of-40/

Dodd, M. (2005, October 1). *Comparing performance when invested capital is low*. Retrieved from McKinsey: https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/comparing-performance-when-invested-capital-is-low

Eurostat. (2021, October 20). *Inflation in the euro area*. Retrieved from eurostat Statistics Explained: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Inflation_in_the_euro_area#Euro_area_annual_inflation_rate_and_its_main_components

EY. (2021). *What to know when adopting subscription or consumption business models.* Ernst & Young.

Forrester. (2019). *The Total Economic Impact og VMware Tanzu Application Service.* Forrester.

Frost & Sullivan. (2020). *Why FInancial Services Firms Need an Open Hybrid Cloud to Succeed in the Digital Era.* Santa Clara, CA: Frost & Sullivan.

Gartner. (2021, April 21). *Gartner Forecasts Worldwide Public Cloud End-User Spending to Grow 23% in 2021*. Retrieved from Gartner: https://www.gartner.com/en/newsroom/press-releases/2021-04-21-gartner-forecasts-worldwide-public-cloud-end-user-spending-to-grow-23-percent-in-2021

Grand View Research. (2020). *Unified Endpoint Management Market Size Report, 2020-2027.* Grand View Research.

Henisz, W., Koller, T., & Nuttall, R. (2019). *Five ways that ESG creates value.* McKinsey Quaterly.

IDC. (2021, March 9). *Public Cloud Services Spending in Asia/Pacific* to Reach US$ 48.4 Billion by 2021*. Retrieved from IDC: https://www.idc.com/getdoc.jsp?containerId=prAP47519421

IMF. (2021, October 19). Regional economic outlook. Asia and Pacific: navigating waves of new variants: pandemic resurgence slows the recovery. *Regional Economic Outlooks*, p. 26.

IMF. (2021, October 19). Regional economic outlook. Europe: the European recovery: policy recalibration and sectoral reallocation. *Regional economic outlooks*, p. 25.

Jensen, J. (2021). *Worldwide Cloud System and Service Management Software Market Shares, 2020: Growth Continues for Top Vendors.* IDC.

Koller, T., Goedhart, M., & Wessels, D. (2015). *Corporate Valuation: Measuring and Managing Corporate Value.* New Jersey: John Wiley & Sons.

Luxner, T. (2021, March 15). *Cloud Computing Trends: 2021 State of the Cloud Report.* Retrieved from Flexera: https://www.flexera.com/blog/cloud/cloud-computing-trends-2021-state-of-the-cloud-report/

Markets and Markets. (2020, August). *Software-Defined Data Center Market*. Retrieved from Markets and Markets: https://www.marketsandmarkets.com/Market-Reports/software-defined-data-center-sddc-market-1025.html

Markets and Markets. (2021, March). *Enterprise Mobility Management Market*. Retrieved from Markets and Markets: https://www.marketsandmarkets.com/Market-Reports/enterprise-mobility-management-market-31847012.html

Moorhead, P. (2021, April 16). *The Dell Tech And VMware Spin-Off Benefits Everybody*. Retrieved from Forbes: https://www.forbes.com/sites/patrickmoorhead/2021/04/16/the-dell-tech-and-vmware-spin-off-benefits-everybody/?sh=2f6809945d2d

Nordea. (2021, October). *United States: Economic and Political Overview*. Retrieved from NoreaTrade: https://www.nordeatrade.com/fi/explore-new-market/united-states/economical-context

OECD. (2021, February 4). Economic Outlook for Southeast Asia, China and India 2021: Reallocating Resources for Digitalisation. *Southeast Asian Economic Outlook*, p. 2015. doi:https://doi.org/10.1787/23101113

OECD. (2021, May). *Economic Surveys of the European Union and the Euro Area*. Retrieved from OECD: https://www.oecd.org/economy/euro-area-and-european-union-economic-snapshot/

OECD. (2021, May). *United States Economic Snapshot*. Retrieved from OECD: https://www.oecd.org/economy/united-states-economic-snapshot/

Powell, J. (2021, October 12). *S&P 500: pay to play?* Retrieved from Financial Times: https://www.ft.com/content/8a018ad0-18cc-4e1d-a70d-515f55f09306

Rana, A., & Kolar, S. (2021). *Private, Hybrid Cloud Long-Term Growth.* Bloomberg Intelligence.

Rana, A., & Kolar, S. (2021). *Security, Mobility Emerging Sales Drivers.* Bloomberg Intelligence.

Rana, A., & Kolar, S. (2021). *VMware Research.* Bloomberg Intelligence.

Roche, P., Schneider, J., & Shah, T. (2020). *The next software disruption: How vendors must adapt to a new era .* McKinsey & Company.

Statista. (2021, May). *Information security spending worldwide from 2017 to 2021 (in million U.S. dollars), by segment*. Retrieved from Statista: https://www-statista-com.eu1.proxy.openathens.net/statistics/790834/spending-global-security-technology-and-services-market-by-segment/

Statista. (2021, July). *Market share of leading virtualization technologies worldwide as of July 2021*. Retrieved from Statista: https://www-statista-com.eu1.proxy.openathens.net/statistics/1252355/top-virtualization-technologies-by-domain/

VMware. (2021). *Global Security Insights Report 2021: Extended enterprise under threat.* CA: VMware, Inc.