

Company: **Deere & Company (NYSE: DE)**

Performance Rating: **Sell**

Current Price: **\$365.36**

Target Price: **\$293.23**

Investment Horizon: **12 – 18 Mos**

### Performance Highlights

**YTD Change: -14.5%**

**P/E (LTM) multiple: 10.8x**

**Market Cap: \$105.2b**

**Dividend Yield: 1.5%**



Source: Factset

**Investment Team:** Abby Doeksen and Zach Ogle

**Report Date:** November 1<sup>st</sup>, 2023

## **Contents**

1. COMPANY OVERVIEW	3
2. COMPETITIVE LANDSCAPE	4
3. REVENUE FORECAST	6
4. COSTS & CASH FLOW FORECASTS	8
5. VALUATION METHODOLOGY & WACC	12
6. VALUATION & RECOMMENDATION	14
7. WHAT THE MARKET MISSED	16
8. APPENDIX	18

## 1. Company Overview

**Overview.** John Deere (NYSE: DE) is the global market leader in the Agriculture Equipment space, selling over 2 million pieces of Agriculture Equipment per year. John Deere was founded in 1837 in Moline, Illinois, and is still headquartered today. John Deere employs over 80,000 people in 30 countries across 100+ global office locations. John Deere sells its equipment through a network of over 3,700 dealer locations.

**Financials.** In 2022, John Deere reported \$52.5B in revenue with \$10.8B of EBITDA (~21% margins) and has had historical growth of 9% p.a. over the last five years (CAGR from FY18-22). The company's revenue is diversified globally, with ca. 60% of sales coming from the US and Canada, ca. 17% from Europe, ca. 14% from LATAM, and ca. 9% from Asia/the Middle East.

**Ownership History.** John Deere & Company went public in 1972. The company is viewed as a value stock and draws the attention of prominent value investors such as Berkshire Hathaway, which made a substantial investment in 2015.

**M&A History.** Since the company's IPO in 1972, John Deere has successfully completed the integration of over 35 acquisitions. Recent acquisitions, such as Smart Guided Systems and SparkAI acquired in 2023, have been in the AI/smart technology space. The company is acquiring business to help improve its smart equipment offerings.

**Management.** John Deere benefits from seasoned leadership, which highlights the stability of the company over time (e.g., value investment). The CEO, John May, has served as CEO since 2019. Mr. May joined John Deere in 1997 and worked his way up through various roles in the Agriculture and Turf divisions. The company's CFO is Joshua Jepson, who started at John Deere out of undergrad in 2001 and worked his way up the finance department.

The company has **three main reporting segments**, or divisions, which are described below.

- *Production & Precision Ag (~42% of sales)*: This segment develops large-scale farm equipment that often has long attachments to service big fields. Example equipment includes seeding, pesticide spraying, and picking/harvesting equipment.
- *Small Ag & Turf (25% of sales)*: This segment primarily develops mid-sized utility tractors and mid-sized attachments. Example equipment includes lawn mowers, golf course equipment, and traditional tractors.
- *Construction & Forestry (~24% of sales)*: This segment develops machines used in construction, earthmoving, and material handling processes. Example equipment includes dump trucks, asphalt pavers, and timber/log harvesters.

Other represents the remaining ~9% of sales, this is comprised of various "enabling businesses" that sell support or other misc. services (such as financing solutions) to customers of the main three segments.

## 2. Competitive Landscape

**Key Competitors.** While there are many agriculture and Construction Equipment manufacturers globally, there is a limited set of scale players against which John Deere primarily competes. John Deere's key competitors are listed below.

### Agriculture Machinery Competitors

- **CNH Industrial (\$24b rev, 40k FTEs).** A top European player, with a large presence in the US. The company markets equipment not under the CNH logo but through a range of brands such as New Holland, Case IH, Steyr, and others.
- **AGCO (\$13b rev, 26k FTEs).** Headquartered in Georgia, USA, AGCO is a relatively new entrant in the market (established in 1990) focusing exclusively on agricultural equipment (do not sell construction equipment).
- **Mtd Products (~\$2.6b rev, 7.5k FTEs).** Based in Ohio, USA, MTD Products is John Deere's principal competitor in the small agriculture and turf segment, specializing in equipment like lawnmowers, utility vehicles, and smaller tractors.
- Other Agricultural Equipment competitors of note include CLASS, Kubota, Mahindra, and Toro.

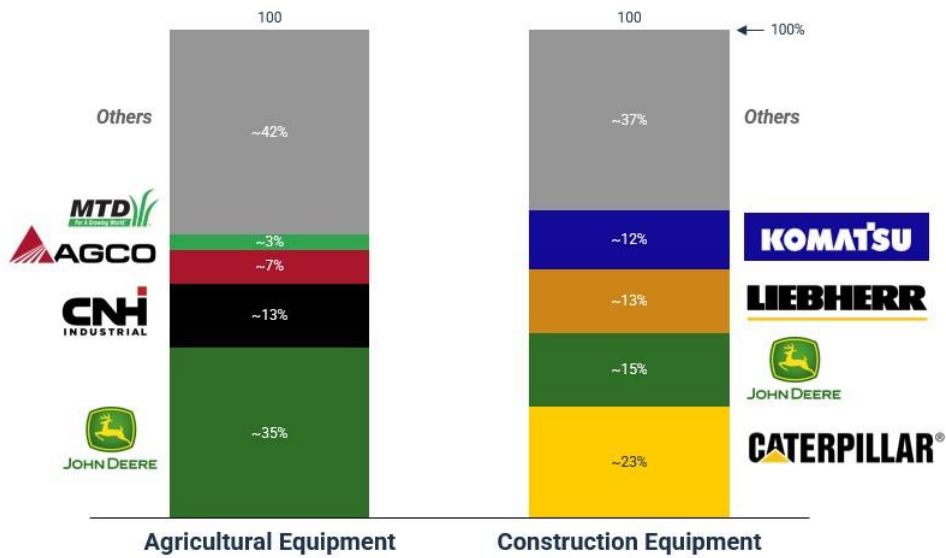
### Construction Machinery Competitors

- **Caterpillar (\$59b rev, 109k FTEs).** Based in Texas, USA, Caterpillar is the market leader in the Construction and Mining Equipment markets and John Deere's main competitor in the Construction Equipment Space. Caterpillar does sell Agricultural Equipment, but it is a much smaller portion of their business.
- **Komatsu (\$23b rev, 23k FTEs).** Based in Japan, the company is a market leader in Asia and other parts of the world outside of N. America. The company sells construction and mining equipment.
- **Liebherr Group (\$16b rev, 51k FTEs).** Originally German, now Swiss-based, Liebherr is a major European competitor in construction machinery. Besides construction equipment, they also provide aerospace, oil and gas equipment, hospitality industry products, and more.
- Other Construction Equipment competitors of note include Hitachi, Komatsu, SANY, Terex, Volvo Group, and Fayat group.

**Points of Differentiation.** John Deere has three main points of differentiation versus its competitors, which includes its reputation for quality, its significant scale, and its product leadership in "smart" equipment. Deere is recognized globally for its dependable and superior-quality equipment, underpinned by its nearly two centuries of experience in the space. In addition, Deere's scale advantage includes an extensive dealer network and a broad product range, enabling it to serve a diverse customer base. Lastly, John Deere has invested heavily into "smart equipment" (showcased by recent acquisitions) and is thought to have a head-start versus other competitors in its "smart equipment" offering.

**Market Shares.** John Deere leads the U.S. agricultural machinery market and is a top contender in construction machinery. IBISWorld estimates that Deere holds around 35% of the U.S. tractor and agricultural machinery market—approximately 2.7x times the relative market share of its closest competitor, CNH. In the construction machinery segment, Deere is second only to Caterpillar, with an estimated 15% market share.

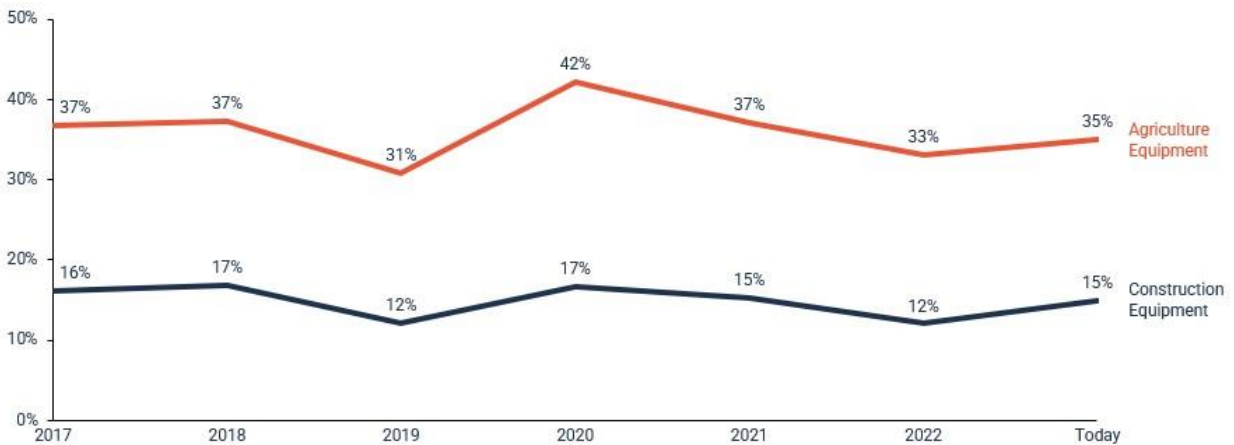
**Figure 2.1: Estimated US Market Shares of Key Competitors**



Source: IBIS World (Industries 33311 & 33312)

**Market Share Trends.** In the agricultural equipment sector, John Deere has maintained a relatively stable market share, fluctuating between 31% and 37% over recent years, with the notable exception of 2020. During that year, John Deere's market share in agricultural equipment spiked to 42%, likely due to the company capturing market share from smaller competitors who were impacted by the COVID-19 pandemic. In addition, in the construction equipment market, John Deere's market share also fluctuates but has been consistently between 12% to 17% over the last few years. Fluctuating market share in Equipment industries is partially driven by sale "lumpiness" due to high sticker prices per unit sold and varying purchase frequency by end customers.

**Figure 2.2: John Deere's Estimated Market Share Overtime**



Source: IBIS World (Industries 33311 & 33312)

**Risk of New Entrants.** The agricultural and construction equipment sectors are characterized by significant entry barriers. The complexity and technical specifications of the machinery, especially with the advent of smart equipment capable of sophisticated tasks such as discerning weeds from crops before picking, limit the threat of new competitors. In addition, another large barrier is the large start-up costs to start a new Equipment manufacturing business, including the high capex investments required to build the manufacturing facilities and the dealer locations to sell the end products.

**3. Revenue Forecast**

Revenue Forecast Methodology

To forecast revenues, we segmented John Deere's revenues into agricultural, construction, and 'other' revenue. Agricultural revenue incorporates the Production & Precision AG segments and Small AG & Turf segments in use since FY2019. It also consists of the Agriculture and Turf segment used from 2007 – 2018 and the Agricultural Equipment and Commercial and Consumer Equipment segments in use before 2007. Construction revenue incorporates the Construction and Forestry segment in use over the life of our dataset. Our 'other' segment includes Financial Services, Other revenues, Corporate, and intercompany segments. This approach addresses the company's evolving revenue segmentation methods over the years and allowed us to utilize a larger data set when building regressions to predict future sales. By consolidating into these broader categories, we ensure consistent analysis and predictions, minimizing disruptions from classification changes.

**Agricultural Segment.** Agriculture customers' ability to purchase equipment from John Deere is primarily impacted by farm cash receipts. Elevated farm cash receipts enhance farmers' purchasing power, leading to increased sales of Deere's machinery and equipment. To predict growth for Deere's agricultural segment, we selected Agricultural Price Index (API) growth as the primary indicator. API growth offers insights into farmers' potential income, influencing their equipment purchases. Forecasts for API are more readily available than forecasts for farm cash receipts, and changes in API are correlated with changes in farm cash receipts.

To determine the impact of API on Deere's agricultural sales, we utilized a changes-on-changes OLS regression to delve into the determinants of Deere & Company's agricultural revenues. The regression model used was<sup>1</sup>:

$$\text{LogAgRev}_t = \beta_0 + \beta_1 \text{LogAgRev}_{t-1} + \beta_2 \text{Log} \frac{\text{API}_t}{\text{API}_{t-1}} + \varepsilon$$

Our regression utilized Deere agricultural segment revenues and API values dating back to 2000 and generated the following coefficients with an R-squared value of .936:

$\beta_0$	.9677
$\beta_1$	.9045

<sup>1</sup> Note that while macro indicators such as access to credit and GDP growth are widely thought to impact revenue growth, multiple regressions showed their impact to be statistically insignificant. To understand the impact of inflation, a separate regression including  $\text{Log} \frac{\text{CPI}_t}{\text{CPI}_{t-1}}$  was examined. The effects of the change in API term were significant, while the change in CPI term was not.

$\beta_2$	1.1950
-----------	--------

**Construction Segment.** In contrast to the Deere and Co.'s agricultural segment, revenue for the construction segment is predominantly tied to World GDP growth. Construction projects are tied to overall economic performance, and need for construction equipment shrinks during times of reduced or negative growth.

To determine the impact of World GDP on Deere's construction segment sales, regressed the log of construction revenue on a constant, the log of construction revenue in the previous period,  $t-1$ , and period  $t$  growth in World GDP. The regression model used was:

$$\text{LogCnstrctRev}_t = \beta_0 + \beta_1 \text{LogCnstrcutRev}_{t-1} + \beta_2 \text{GDP\_World\_Growth} + \varepsilon$$

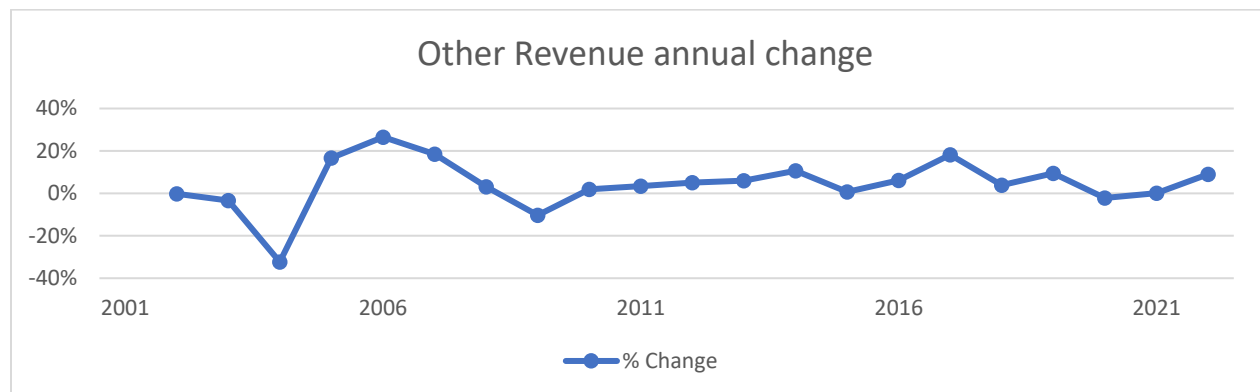
Our regression utilized Deere construction segment revenues and World GDP values dating back to 2000 and generated the following coefficients with an R-Squared value of .776:

$\beta_0$	.2392
$\beta_1$	.9541
$\beta_2$	8.8877

We then combined World GDP forecast through 2028 to forecast future revenues:

**Other Revenue.** To forecast the Other Revenue segment, we first plotted annual change for the segment. Since 2010, the annual growth rate has hovered around 5% per year and achieved a CAGR of 5.8% from 2010 - 2022. To forecast future growth, we utilized the CAGR of 5.8% through 2028.

**Figure 3.1: John Deere's Other Revenue growth rate since 2002**



### Segment Level Revenue Forecasts

**Agriculture segment.** To estimate 2023 sales, we extrapolated Q3 2023 performance vs Q3 2022 and assumed gains hold constant in Q4. Agricultural sales are up 25.9% compared to 2022, and we have forecast this trend to continue for the remainder of the fiscal year. This is slightly more favorable than management projections of 20% growth in the segment. We are comfortable with our projection, as management forecasts from Q3 to end of year have historically proven slightly conservative. For 2024 – 2028, we combined API forecast data with the previously described regression forecast future revenues. In the long term, farm equipment is expected to maintain a constant share of overall economy. So, after 2028 we assumed growth at a terminal value in line with expected inflation of 2%.

	2022A	2023E	2024F	2025F	2026F	2027F	2028F
API	120.54	119.70	111.99	108.10	106.75	106.96	107.45
Change in Ag revenue		25.9%	-13.4%	-8.4%	-4.9%	-2.7%	-2.1%
Agricultural revenue (\$b)	35,412	44,584	38,601	35,355	33,630	32,729	32,038

Source: IBIS World (I102: Agricultural Price Index)<sup>2</sup>

**Construction segment.** Similar to the agricultural segment, we used performance from Q1 – Q3 of 2023 compared to the same period in 2022 to forecast 2023 construction sales. In line with Q3 2023 filings and management guidance, we expect construction sales to grow 17.1% in 2023. For 2024 – 2028, we incorporated World GDP growth forecast data with our regression to predict future revenue growth. After 2028, we assumed that construction revenues grew at a terminal value in line with expected inflation of 2%.

	2022A	2023E	2024F	2025F	2026F	2027F	2028F
World GDP Growth		2.9%	2.6%	2.9%	3.2%	3.1%	3.1%
Change in Construction revenue		17.1%	0.7%	2.6%	5.6%	4.4%	4.2%
Agricultural revenue (\$b)	21,990	25,750	25,933	26,609	28,096	29,346	30,590

Source: IBIS World (A3111: World GDP)

**Other revenue.** As in prior sections, we project the 'Other' revenue segment to sustain its growth pace set through Q3 2023. For 2024-2028, we've based our forecasts on the 2010-2022 CAGR of 5.8%. We anticipate this moderated growth aligns with expectations of softer expansion in other segments, especially as revenue from financial services decelerates parallel to machinery sales. Our terminal growth rate assumption is 2%, consistent with long-term inflation.

	2022A	2023E	2024F	2025F	2026F	2027F	2028F
Other Revenue	4,630	5,311	5,619	5,945	6,289	6,654	7,040
% Change		14.7%	5.8%	5.8%	5.8%	5.8%	5.8%

#### 4. Costs & Cash Flow Forecasts

##### Costs Forecasts

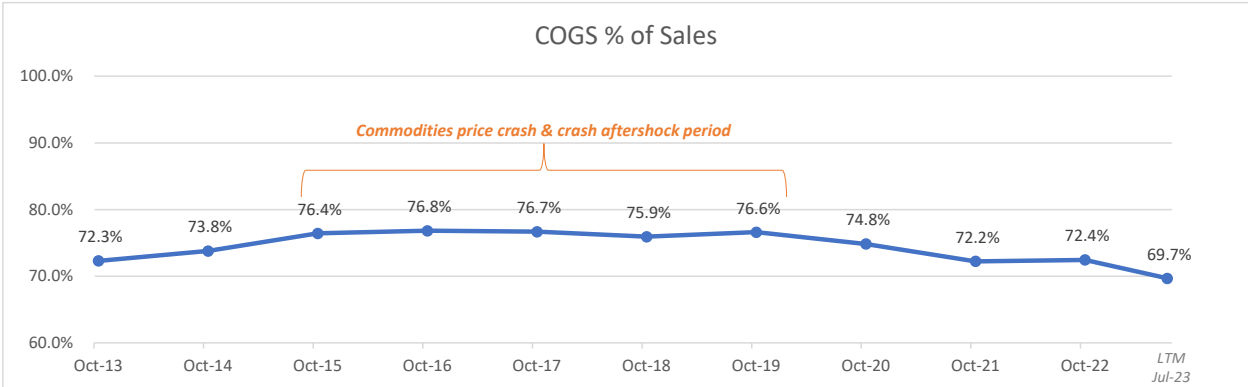
**COGS.** For 2023E we assumed COGS as a percentage of sales would be equal to Deere's latest LTM figure for COGS/Sales (69.7%), specifically, this is the Q3-2023 LTM figure as Deere has an October year-end and already reported Q3-2023 results. We believe the latest LTM figure best reflects what Deere will achieve this full fiscal year, and thus used that for our 2023E COGS assumption. Then, we assumed COGS would be equal to 72.3% of sales in each year thereafter in our forecast (2024-2028F). This figure is the median of Deere's COGS as a percentage of sales in 2021 and 2022, which were 72.4% and 72.2%, respectively. We didn't include the 2023 LTM Q3-2023 figure in our median calculation for two reasons 1.) Deere was able to realize higher than normal CPI+ price increases in 2023 due to the inflation

<sup>2</sup> We utilized IBISWorld forecasts because they are the best available forecast for this indicator. Limited data suggests previous forecasts have landed within 1.7% of actuals for the first three forecast periods.



environment, which is temporarily causing the COGS percentage per unit to decline and 2.) we believe that the 72-73% better reflects a normalized COGS percentage based on historical trends. Expanding on point 2, historically, Deere's COGS have hovered around 72-73%, excluding the period from 2015 to 2019 when COGS increased to about 76-77% of sales. We attribute this anomaly to the 2015 commodity price crash, which notably decreased Deere's sales by 20% from 2014 to 2015, and likely led to the company offering equipment at reduced prices to boost sales after the crash, consequently inflating the COGS percentage due to lower sales figures per unit. However, Deere's COGS have reverted to pre-2015 levels of approximately 72-73% in 2021 and 2022. Given COGS returned to the 72-73% pre-2015 levels, we believe the 72-73% levels represent a normalized COGS as a percentage of sales percentage and thus based our future years' forecast on this.

**Figure 4.1: John Deere's COGS over the last 10 years**

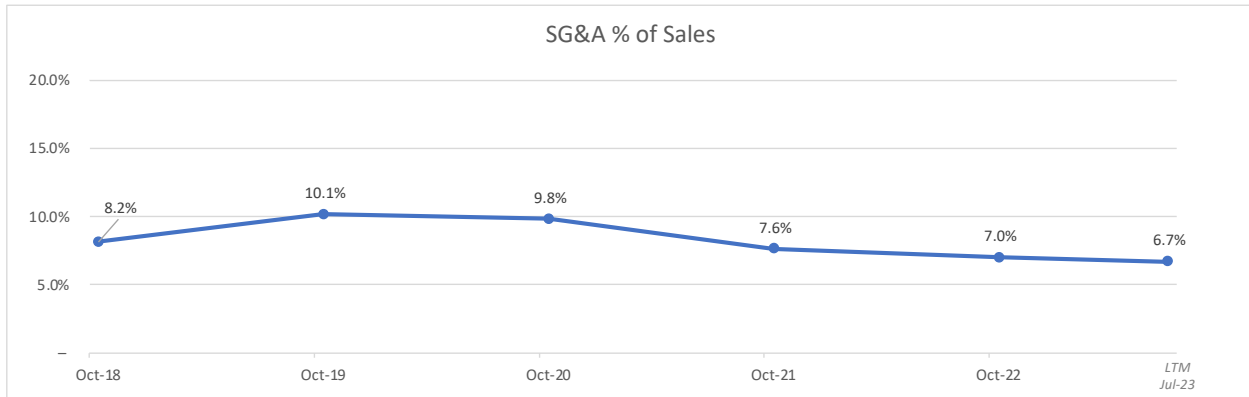


*Note: Deere has a 10/31 fiscal year-end*

*Source: CAPIQ estimates*

**SG&A.** For 2023E, we assumed SG&A as a percentage of sales would be equal to Deere's latest LTM figure for SG&A/Sales (6.7%), specifically this is the Q3-2023 LTM figure as Deere has an October year-end and already reported Q3-2023 results. We believe the latest LTM figure best reflects what Deere will achieve this full fiscal year, and thus used that for our 2023E SG&A assumption. Then, we assumed SG&A would be 7.0% of sales in every year thereafter in our forecast (2024F-2028F). 7.0% is the median of Deere's 2021, 2022, and Q3 2023 LTM SG&A as a percentage of sales which were 7.6%, 7.0%, and 6.7% respectively. This assumption takes into account the effects of Deere's cost-cutting measures initiated in late 2019 that were going to be driven in part by corporate headcount reductions, which are likely in SG&A. The cost-cutting initiatives were expected to yield annual savings of \$150 million after incurring \$140 million in upfront costs. Some of the initial costs were likely absorbed in the 2020 SG&A figures. Therefore, we believe the post-2020 SG&A percentages to better reflect the ongoing cost structure following the implementation of these savings initiatives, which is why our SG&A forecast is anchored to the figures from 2021 onward.

**Figure 4.2: John Deere's SG&A over the last five years**

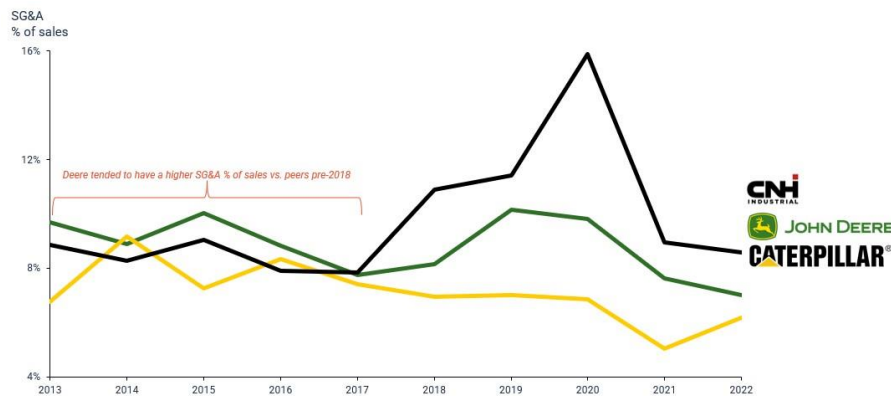


Note: Deere has a 10/31 fiscal year-end

Source: CAPIQ estimates

In addition, we benchmarked Deere's SG&A as a percentage of sales versus Deere's largest competitors mentioned in section two (Caterpillar and CNH). The benchmarking analysis showed that pre-2018, Deere had a higher SG&A as a percentage of sales versus other scale players in its industries. The cost-saving initiatives Deere announced in late 2019 could be viewed as Deere "catching up" to its peer group. In addition, since 2018, Deere has always maintained higher SG&A as a percentage of sales vs. Caterpillar, signaling lower levels of SG&A are feasible. As a result, we believe that Deere's more recent lower levels of SG&A represent feasible/reasonable go-forward normalized SG&A as a percentage of sales and we anchored our SG&A assumption on Deere's recent SG&A figures.

**Figure 4.3: SG&A Competitive Benchmarking**



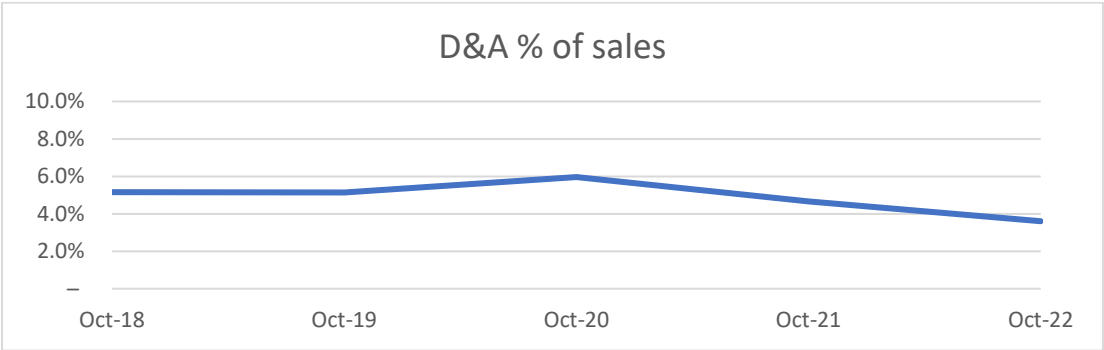
Source: CAPIQ estimates

Cash Flow Line Items Forecasts

**D&A.** We assumed D&A would be 5.1% of sales in every year of our forecast, based on an extrapolation of historical; specifically, 5.1% is Deere's median D&A percentage of sales over the last five years (FY18-FY22). Deere's D&A as a percentage of sales has been stable historically, ranging between 4% and 6% of sales over the last five years. This consistency is underscored by the five-year historical average (4.9%)

being quite close to the 5-year historical median (5.1%). Based on this historical stability, we believe that Deere will maintain D&A as a percentage of sales in-line with historicals for the foreseeable future.

**Figure 4.4: John Deere’s D&A over the last five years**

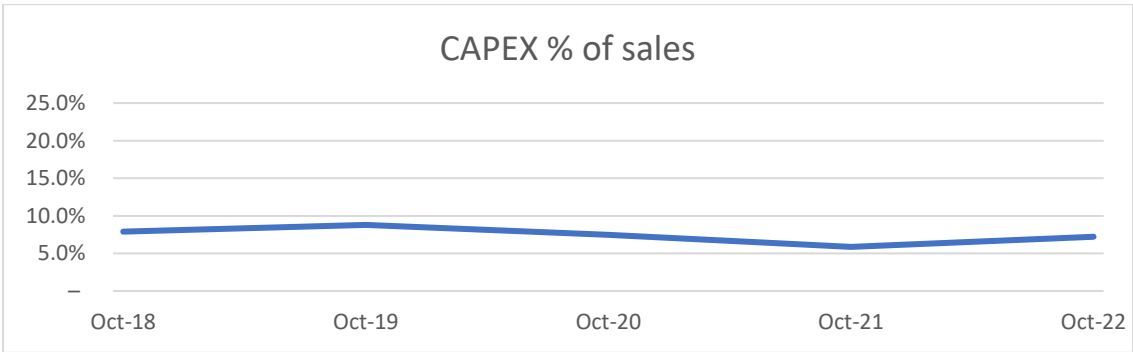


*Note: Deere has a 10/31 fiscal year-end*

*Source: CAPIQ estimates*

**CAPEX.** We assumed CAPEX would be 7.5% of sales in every year of our forecast, which is based on an extrapolation of historicals; specifically, 7.5% is Deere’s median CAPEX as a percentage of sales over the last five years (FY18-FY22). CAPEX has been at relatively stable levels of ~7-8% of sales over the previous five years. The minimal variation in these past years suggests a steady CAPEX trend, leading us to project that Deere's near-term CAPEX will likely follow this established pattern. Thus, our forecast is anchored to a historical median.

**Figure 4.5: John Deere’s CAPEX over the last five years**

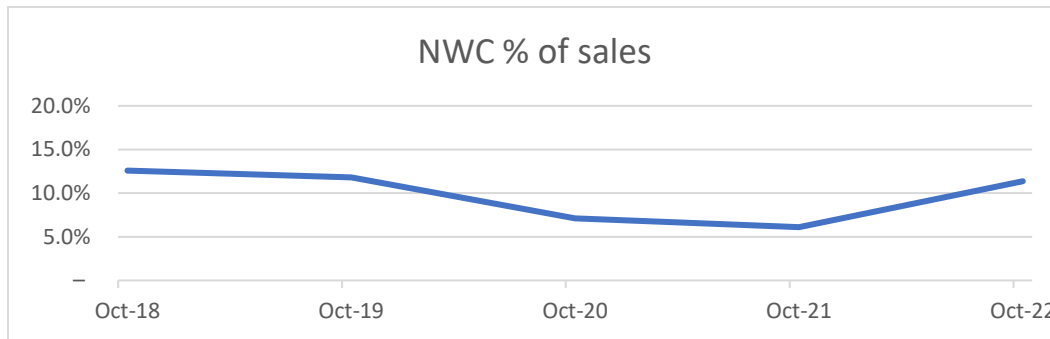


*Note: Deere has a 10/31 fiscal year-end*

*Source: CAPIQ estimates*

**NWC.** We assumed Net Working Capital (NWC) would equal 11.4% of Deere's sales in each year of our forecast, which is equal to the 2022 figure for NWC/Sales. During the pandemic years (FY20-21), this percentage temporarily decreased to 6-7%. However, in 2022, NWC rebounded to approximately 11%, indicating a return to pre-pandemic levels. Therefore, we believe the 2022 NWC percentage reflects a normalized level and have used this as the basis for our projection.

**Figure 4.6: John Deere's NWC over the last five years**



*Note: Deere has a 10/31 fiscal year-end*

*Source: CAPIQ estimates*

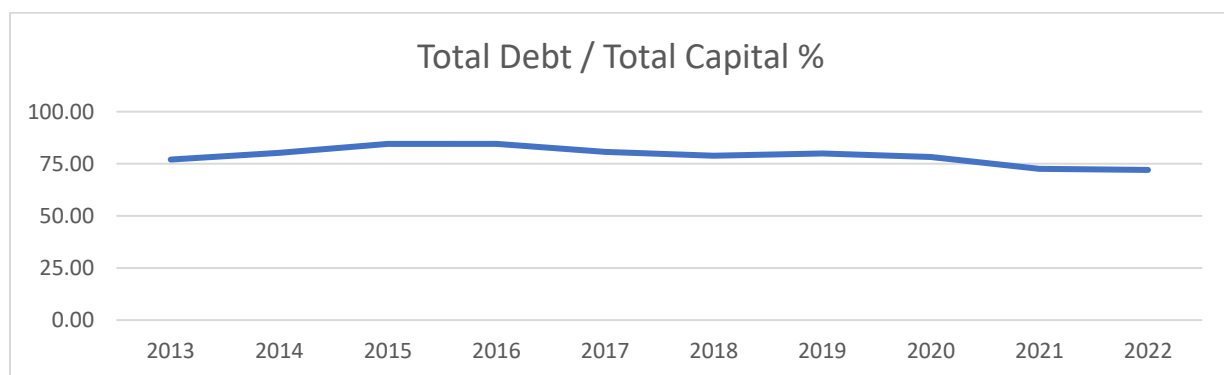
**Tax Rate.** We assumed a tax rate of 22%, which is the midpoint of John Deere's FY2023 Tax Rate guidance range. According to John Deere's Q3 2023 Investor Presentation, Deere's guidance for its FY2023 Tax Rate is 21-23%. We assumed Deere's latest tax rate guidance in all years of our forecast because we have no reason to believe Deere's tax rate will change in the near-term.

**Terminal Value Growth Rate.** We assumed a terminal value growth rate of 2%, the US Fed's target inflation rate.

## 5. Valuation Methodology & WACC

**Methodology.** Deere's D/V ratio has been relatively constant historically at around ~0.75-0.80 over the last 10 years. As a result, for our analysis, we used the standard DCF valuation method, discounting forecasted FCFs using a WACC.

**Figure 5.1: John Deere's Debt / Total Capital over time**



*Source: Factset*

**Discount Rate.** Based on the assumptions listed below, we assumed a discount rate, or WACC, of 5.78%.

WACC INPUTS	Value	Notes
% Debt	79%	10-year historical median from FY13-FY22 (see exhibit above)
Rd	5.36%	Average of known yields for bonds issues so far this year (see exhibit below)
Tax Rate	22.0%	Forecast Assumption (see section 4)
% Equity	21%	
Re	11.9%	Calculated using CAPM
Be	1.00	Rolling Beta has hovered around 1 since early 2021 (see exhibit below)
Rm-Rf	7.0%	LT Historical Average
Rf	4.931%	Current 10-year treasury rate as of 10/31/23 (see exhibit below)

**WACC 5.78%**

- **Return on Debt:** We assumed a Rd of 5.36% based on below, which shows the average yield of Deere's Notes/Bonds issued so far this year is 5.36%. We assumed this is a good estimate for Deere's current cost of debt.

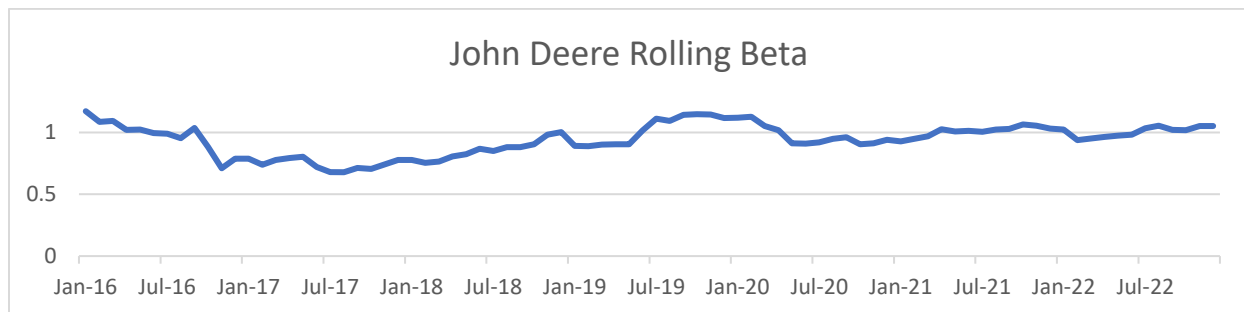
**Figure 5.2: John Deere's Bond Issues YTD 2023**

Instrument ID	Description	Face Sheet Amt	Out Amt	Coupon Rat	Coupon Typ	Issue Dat	Maturity Dat	Issue Cur	Seniorit	Price	YTW	
XS2703627021	John Deere Bank SA 5.125% 18-OCT-2028	-	486.2	5.125%	Fixed	10/23	10/28	GBP	SNR Unsec	99.11	5.26	
47788ZAP	John Deere Financial, Inc. 5.170% 15-SEP-2028	-	470.0	5.170%	Fixed	09/23	09/28	CAD	SNR Unsec	99.41	5.30	
24422EXE	John Deere Capital Corporation 5.150% 08-SEP-2033	-	1,000.0	5.150%	Fixed	09/23	09/33	USD	SNR Unsec	95.56	5.75	
24422EXD	John Deere Capital Corporation 5.150% 08-SEP-2026	-	550.0	5.150%	Fixed	09/23	09/26	USD	SNR Unsec	99.62	5.29	
24422EXC	John Deere Capital Corporation 5.300% 08-SEP-2025	-	350.0	5.300%	Fixed	09/23	09/25	USD	SNR Unsec	99.86	5.37	
24422EXA2	John Deere Capital Corp - MTN - Series I	500.0	500.0	5.707%	Variable	07/23	07/25	USD	SNR Unsec	100.20	5.40	
24422EXB0	John Deere Capital Corp - MTN - Series I	1,500.0	1,500.0	4.950%	Fixed	07/23	07/28	USD	SNR Unsec	97.65	5.52	
24422EWW5	John Deere Capital Corp - MTN - Series I	600.0	600.0	4.950%	Fixed	06/23	06/25	USD	SNR Unsec	99.40	5.34	
24422EWX3	John Deere Capital Corp - MTN - Series I	600.0	600.0	4.750%	Fixed	06/23	06/26	USD	SNR Unsec	98.57	5.34	
47788ZAN1	John Deere Financial Inc - 500M CAD	377.8	377.8	4.950%	Fixed	06/23	06/27	CAD	SNR Unsec	98.91	5.28	
24422EWZ8	John Deere Capital Corp MTN - Series I	1,000.0	1,000.0	4.700%	Fixed	06/23	06/30	USD	SNR Unsec	94.46	5.72	
24422EWS4	John Deere Capital Corp - MTN - Series H	500.0	500.0	5.150%	Fixed	03/23	03/25	USD	SNR Unsec	99.81	5.29	
24422EWU9	John Deere Capital Corp - MTN - Series H - FRN	300.0	300.0	5.736%	Variable	03/23	03/26	USD	SNR Unsec	100.05	5.33	
24422EWT2	John Deere Capital Corp - MTN - Series H	650.0	650.0	5.050%	Fixed	03/23	03/26	USD	SNR Unsec	99.45	5.30	
24422EWW7	John Deere Capital Corp - MTN - Series H	650.0	650.0	4.900%	Fixed	03/23	03/28	USD	SNR Unsec	97.77	5.48	
24422EWP0	John Deere Capital Corp - MTN - Series H	1,200.0	1,200.0	4.800%	Fixed	01/23	01/26	USD	SNR Unsec	98.75	5.41	
24422EWR6	John Deere Capital Corp - MTN - Series H	1,100.0	1,100.0	4.750%	Fixed	01/23	01/28	USD	SNR Unsec	97.20	5.50	
											Average	5.36
											Median	5.44

Source: Factset as of 10/31/2023

- **Equity Beta:** We assumed a Beta Equity of 1 based on below, which shows the Rolling beta has hovered around 1 since early 2021.

**Figure 5.3: John Deere's Rolling Equity Beta**



Notes: 5-year rolling beta, US overall stock market return used for market return

Source: CRSP Data (WRDS), Team Analysis

- Risk-free rate: We used the current rate on the 10-year US Treasury, 4.931%

**Figure 5.4: 10-year Treasury Rate overtime**



Source: CNBC (10/31/2023)

## 6. Valuation & Recommendation

**PnL Forecast.** We forecasted John Deere's income statement for the next five years using the above assumptions mentioned in sections 3 and 4.

**Figure 6.1: Forecasted PnL**

INCOME STATEMENT									
Fiscal Year	2023E	2024F	2025F	2026F	2027F	2028F	CAGRs		
YE Date	10/31/23	10/31/24	10/31/25	10/31/26	10/31/27	10/31/28	'13-22	'18-22	'22-28
<b>Revenue</b>									
Agriculture	44,584	38,609	35,366	33,633	32,725	32,038	2.2%	11.1%	(1.7%)
Construction	14,678	14,781	15,166	16,015	16,719	17,422	8.8%	5.4%	5.6%
Other	5,295	5,602	5,927	6,270	6,634	7,019	6.1%	4.2%	7.2%
<b>Total Revenues</b>	<b>64,557</b>	<b>58,992</b>	<b>56,458</b>	<b>55,918</b>	<b>56,079</b>	<b>56,478</b>	<b>3.7%</b>	<b>8.9%</b>	<b>1.2%</b>
% growth	22.8%	(8.6%)	(4.3%)	(1.0%)	0.3%	0.7%			
(-) COGS	(44,990)	(42,651)	(40,819)	(40,429)	(40,545)	(40,834)	3.8%	7.7%	1.2%
<b>Gross Profit</b>	<b>19,567</b>	<b>16,341</b>	<b>15,639</b>	<b>15,489</b>	<b>15,534</b>	<b>15,645</b>	<b>3.7%</b>	<b>12.7%</b>	<b>1.3%</b>
% of sales	30.3%	27.7%	27.7%	27.7%	27.7%	27.7%			
(-) SG&A	(4,326)	(4,129)	(3,952)	(3,914)	(3,926)	(3,953)	0.1%	4.9%	1.2%
<b>EBITDA</b>	<b>15,240</b>	<b>12,211</b>	<b>11,687</b>	<b>11,575</b>	<b>11,608</b>	<b>11,691</b>	<b>5.3%</b>	<b>16.1%</b>	<b>1.3%</b>
% of sales	23.6%	20.7%	20.7%	20.7%	20.7%	20.7%			
(-) D&A	(3,292)	(3,009)	(2,879)	(2,852)	(2,860)	(2,880)	5.8%	(0.4%)	7.2%
% of sales	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%			
<b>EBIT</b>	<b>11,948</b>	<b>9,203</b>	<b>8,808</b>	<b>8,723</b>	<b>8,748</b>	<b>8,811</b>	<b>5.2%</b>	<b>22.1%</b>	<b>(0.2%)</b>
% of sales	(18.5%)	(15.6%)	(15.6%)	(15.6%)	(15.6%)	(15.6%)			
<b>Memo</b>									
CAPEX	4,842	4,424	4,234	4,194	4,206	4,236			
NWC	7,359	6,725	6,436	6,375	6,393	6,439			
Delta NWC	1,383	(634)	(289)	(62)	18	46			

Source: Team Analysis, CAPIQ, Factset

**FCF Forecast & Valuation.** Using the above income statement forecast and the Cash Flow assumptions mentioned in section 4, we forecasted the FCFs from 2023E to 2028E. Then we discounted the cash flows back to today, using a 5.78% WACC, noting that John Deere has a fiscal year end of 10/31/2023, so no discount was taken to the 2023E for this forecast. **This resulted in a target share price of \$293.23.**

**Recommendation:** *Our estimate for John Deere's share price is approximately 20% lower than the share price today, signaling the current share price is overvalued. As a result, we recommend a sell.*

**Figure 6.2: FCF Forecast & Valuation Estimate**

CASH FLOW STATEMENT							
Fiscal Year	2023E	2024F	2025F	2026F	2027F	2028F	2029F
YE Date	10/31/23	10/31/24	10/31/25	10/31/26	10/31/27	10/31/28	10/31/29
<b>NOPAT</b>	9,319	7,178	6,870	6,804	6,824	6,872	
(+) D&A	3,292	3,009	2,879	2,852	2,860	2,880	
(-) CAPEX	(4,842)	(4,424)	(4,234)	(4,194)	(4,206)	(4,236)	
(-) Delta NWC	(1,383)	634	289	62	(18)	(46)	
<b>FCF</b>	<b>6,387</b>	<b>6,397</b>	<b>5,804</b>	<b>5,524</b>	<b>5,459</b>	<b>5,471</b>	<b>5,581</b>
Terminal Value						147,747	
<b>Total FCF</b>	<b>6,387</b>	<b>6,397</b>	<b>5,804</b>	<b>5,524</b>	<b>5,459</b>	<b>153,218</b>	
WACC	5.78%	5.78%	5.78%	5.78%	5.78%	5.78%	
Discount Factor	1.00	0.95	0.89	0.84	0.80	0.76	
<b>PV of FCFs</b>	<b>6,387</b>	<b>6,047</b>	<b>5,187</b>	<b>4,667</b>	<b>4,361</b>	<b>115,704</b>	

**Valuation Estimates**

<b>PV of FCFs (Est. TEV)</b>	<b>142,354</b>
(-) Latest Reported Net Debt	(57,903)
<b>Est. Equity Value / Market Cap</b>	<b>84,451</b>
(÷) Number of shares outstanding (millions)	288.001
<b>Target Price per share</b>	<b>\$293.23</b>

<b>Latest Close Share Price (10/31/2023)</b>	<b>\$365.36</b>
--	-----------------

Target Price premium (discount) over latest close (20%)

Source: Team analysis, CAPIQ, Factset

**Figure 6.3: Valuation Sensitivities**

		Share Price Sensativity to TV Growth Rate & WACC						
		TV Growth Rate						
		0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%
WACC	4.0%	\$358.3	\$435.7	\$543.9	\$706.3	\$977.0	\$1,518.3	\$3,142.2
	5.0%	\$240.0	\$283.4	\$339.3	\$413.7	\$517.9	\$674.2	\$934.7
	5.8%	\$179.0	\$209.1	\$246.3	<b>\$293.2</b>	\$354.5	\$437.9	\$557.9
	7.0%	\$112.6	\$131.2	\$153.1	\$179.5	\$211.7	\$251.9	\$303.7
	8.0%	\$74.3	\$87.6	\$102.9	\$120.9	\$142.0	\$167.4	\$198.4

Source: Team Analysis

## 7. What the market missed

**Implied Market Assumptions.** We believe we differ from the street valuation due to our assumed revenue growth rates, specifically, we believe the street is assuming that Deere will grow in-line with historical and assumed a linear extrapolation of historical revenue CAGR going forward. If we change our forecasted segment-level revenue growth rates shown in figure 6.1 equal to the historical 10-year CAGR's for each segment (leaving all other assumptions the same), then our target share price is within 5% of the current market price, which implies the market is assuming segment-level growth rates similar to the 10-year historical CAGRs.

**What the Market is Missing.** We believe market projections are not fully accounting for the expected downturn in agricultural prices, likely influenced by farms' strong balance sheets and aging capital assets. This overlooks critical competitive shifts in the sector:

- **Technological parity:** Deere's rivals have closed the technological gap, and offer competitive agricultural technologies that erode the technological advantage that has driven Deere's growth.
- **Competitively priced substitutes:** Competitors like CNH now sell advanced retrofitting solutions, offering farmers a cost-effective alternative to purchasing new equipment.

These competitive developments, in conjunction with the forecasted period of lower crop prices, escalating inflation, and rising interest rates, present significant challenges to Deere's ability to maintain its revenue growth.

### 7.1: Estimate for the street's PnL Forecast

INCOME STATEMENT									
Fiscal Year	2023E	2024F	2025F	2026F	2027F	2028F	CAGRs		
YE Date	10/31/23	10/31/24	10/31/25	10/31/26	10/31/27	10/31/28	'13-22	'18-22	'22-28
<b>Revenue</b>									
Agriculture	36,179	36,963	37,763	38,581	39,417	40,270	2.2%	11.1%	2.2%
Construction	13,638	14,838	16,144	17,564	19,110	20,791	8.8%	5.4%	8.8%
Other	4,897	5,195	5,512	5,847	6,204	6,581	6.1%	4.2%	6.1%
<b>Total Revenues</b>	<b>54,714</b>	<b>56,996</b>	<b>59,419</b>	<b>61,993</b>	<b>64,730</b>	<b>67,643</b>	<b>3.7%</b>	<b>8.9%</b>	<b>4.3%</b>
% growth	4.1%	4.2%	4.3%	4.3%	4.4%	4.5%			
(-) COGS	(38,131)	(41,208)	(42,960)	(44,821)	(46,800)	(48,906)	3.8%	7.7%	4.3%
<b>Gross Profit</b>	<b>16,583</b>	<b>15,788</b>	<b>16,459</b>	<b>17,172</b>	<b>17,930</b>	<b>18,737</b>	<b>3.7%</b>	<b>12.7%</b>	<b>4.4%</b>
% of sales	30.3%	27.7%	27.7%	27.7%	27.7%	27.7%			
(-) SG&A	(3,667)	(3,990)	(4,159)	(4,339)	(4,531)	(4,735)	0.1%	4.9%	4.3%
<b>EBITDA</b>	<b>12,917</b>	<b>11,798</b>	<b>12,300</b>	<b>12,832</b>	<b>13,399</b>	<b>14,002</b>	<b>5.3%</b>	<b>16.1%</b>	<b>4.4%</b>
% of sales	23.6%	20.7%	20.7%	20.7%	20.7%	20.7%			
(-) D&A	(2,790)	(2,907)	(3,030)	(3,162)	(3,301)	(3,450)	5.8%	(0.4%)	10.5%
% of sales	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%			
<b>EBIT</b>	<b>10,126</b>	<b>8,891</b>	<b>9,269</b>	<b>9,671</b>	<b>10,098</b>	<b>10,552</b>	<b>5.2%</b>	<b>22.1%</b>	<b>2.9%</b>
% of sales	(18.5%)	(15.6%)	(15.6%)	(15.6%)	(15.6%)	(15.6%)			
<b>Memo</b>									
CAPEX	4,104	4,275	4,456	4,649	4,855	5,073			
NWC	6,237	6,498	6,774	7,067	7,379	7,711			
Delta NWC	261	260	276	293	312	332			

Source: Team Analysis, CAPIQ, Factset



## 7.2: Estimate for the street's FCF Forecast & Valuation

CASH FLOW STATEMENT							
Fiscal Year	2023E	2024F	2025F	2026F	2027F	2028F	2029F
YE Date	10/31/23	10/31/24	10/31/25	10/31/26	10/31/27	10/31/28	10/31/29
<b>NOPAT</b>	7,899	6,935	7,230	7,543	7,876	8,231	
(+) D&A	2,790	2,907	3,030	3,162	3,301	3,450	
(-) CAPEX	(4,104)	(4,275)	(4,456)	(4,649)	(4,855)	(5,073)	
(-) Delta NWC	(261)	(260)	(276)	(293)	(312)	(332)	
<b>FCF</b>	<b>6,324</b>	<b>5,307</b>	<b>5,528</b>	<b>5,762</b>	<b>6,011</b>	<b>6,275</b>	<b>6,401</b>
Terminal Value						169,459	
<b>Total FCF</b>	<b>6,324</b>	<b>5,307</b>	<b>5,528</b>	<b>5,762</b>	<b>6,011</b>	<b>175,735</b>	
WACC	5.78%	5.78%	5.78%	5.78%	5.78%	5.78%	
Discount Factor	1.00	0.95	0.89	0.84	0.80	0.76	
<b>PV of FCFs</b>	<b>6,324</b>	<b>5,017</b>	<b>4,940</b>	<b>4,869</b>	<b>4,801</b>	<b>132,708</b>	

TV growth

2%

### Valuation Estimates

<b>PV of FCFs (Est. TEV)</b>	<b>158,660</b>
(-) Latest Reported Net Debt	(57,903)
<b>Est. Equity Value / Market Cap</b>	<b>100,757</b>
(÷) Number of shares outstanding (millions)	288.001
<b>Target Price per share</b>	<b>\$349.85</b>

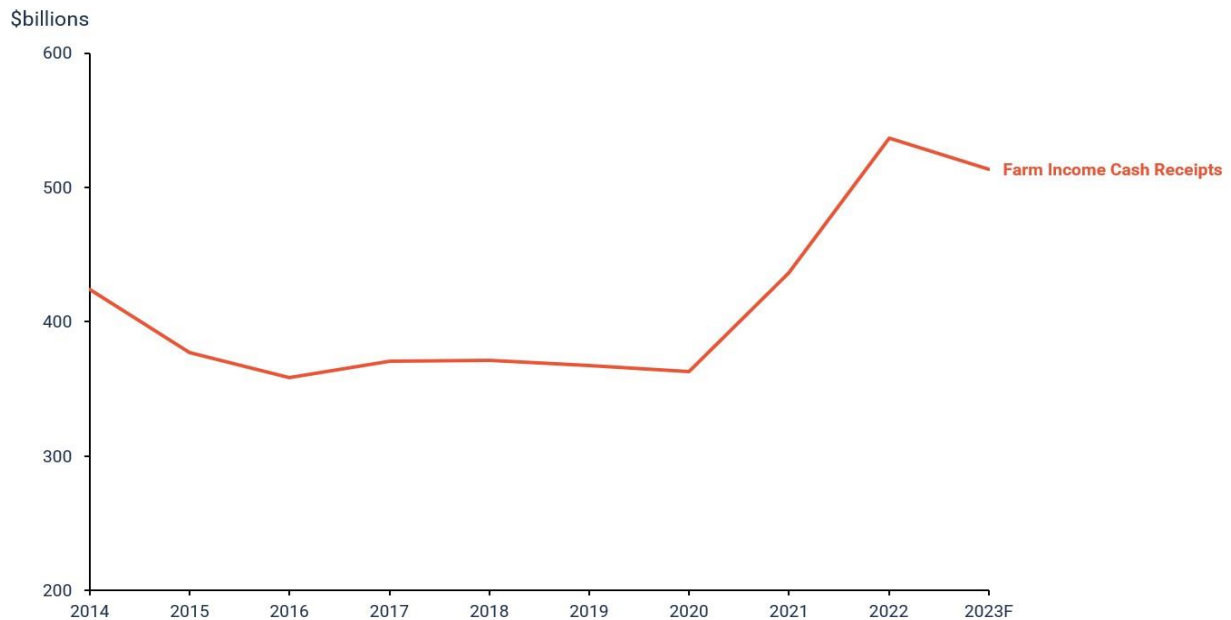
**Latest Close Share Price (10/31/2023)** **\$365.36**

Target Price premium (discount) over latest close (4%)

Source: Team Analysis, CAPIQ, Factset

## 8. Appendix

Figure 8.1: US Farm Income – Cash receipts total (all commodities)



Source: US Department of Agriculture

Figure 8.2: John Deere FY2023 Tax Rate Forecast

FY 2023 FORECAST	
Net Income <i>(attributable to Deere &amp; Co.)</i>	Effective Tax Rate*
<b>\$9.75-10.0B</b>	<b>21-23%</b>

Source: Deere & Co. Q3 2023 Earnings Call Investor Presentation

Figure 8.3: Share Price & Shares Outstanding Information

Latest Capitalization (Millions of USD)	
Currency	USD
Share Price	\$365.36
Shares Out. (m)	288.001

Source: CAPIQ (Data for latest close / close on 10/31/2023)

**Important Disclaimer**

Please read this document before reading this report. This report has been written by MBA students at Yale's School of Management in partial fulfillment of their course requirements. The report is a student and not a professional report. It is intended solely to serve as an example of student work at Yale's School of Management. It is not intended as investment advice. It is based on publicly available information and may not be complete analyses of all relevant data.

If you use this report for any purpose, you do so at your own risk. YALE UNIVERSITY, YALE SCHOOL OF MANAGEMENT, AND YALE UNIVERSITY'S STAFFERS, FELLOWS, FACULTY, STAFF, AND STUDENTS MAKE NO REPRESENTATION OR WARRANTIES, EXPRESS OR IMPLIED, ABOUT THE ACCURACY OR SUITABILITY FOR ANY USE OF THESE REPORTS, AND EXPRESSLY DISCLAIM RESPONSIBILITY FOR ANY LOSS OR DAMAGE, DIRECT OR INDIRECT, CAUSED BY USE OF OR RELIANCE ON THE REPORTS.