



JOHN DEERE

CORPORATE FINANCE

December 2022

- **Deere & Co** is a global leader of agricultural equipment and a sound investment for shareholders
- **Good Corporate Governance** with 11 Board Members, 10 of them independent with a reasonable average tenure
- On a consolidated level, **high D/E biased** by Financial Services Division. Excluding this impact, the Manufacturing Division can increase its financial leverage to reduce WACC, increase remuneration to shareholders and enhance Enterprise Value
- **High historical and current ROIC**, above Cost of Capital. Deere & Co should keep investing in R&D and in Precision Agriculture while maintaining its strong Dealer Network
- **Deere & Co has an estimated equity value of \$127.287 M, an intrinsic value per share of \$421.7 per share and a current market price of \$429.8 per share.**



1. Company Overview

Deere & Company was founded in 1837 and is headquartered in Moline, Illinois. Manufactures and distributes various equipment worldwide, mainly farming machinery, being the **global leader** in the sector, manufacturing and developing some of the most admired heavy agricultural equipment in the world. Deere & CO had Consolidated Revenues of \$44 bn in 2021 (+24%) and a Net Income for the Group of \$5.9 bn, operating globally with 75.600 employees worldwide.

Deere & Company (as a critical and competitive aspects) enjoys an **extensive dealer network** that includes close to 1.900 dealer selling points in the US and more than 3.700 globally.

The company operates through four segments:

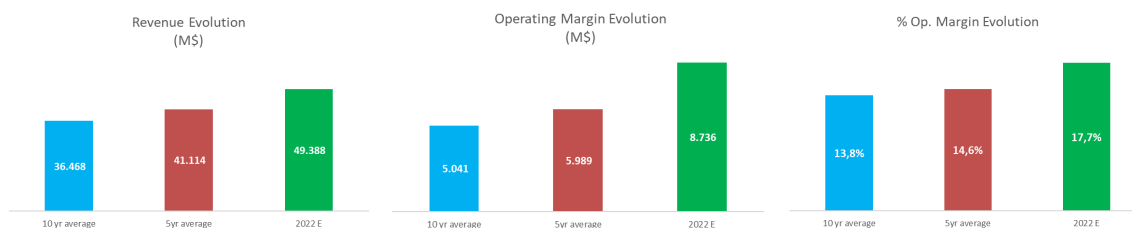
- Production and Precision Agriculture,
- Small Agriculture and Turf
- Construction and Forestry
- Financial Services.

The Production and Precision Agriculture segment provides mid-size tractors, combines, cotton pickers and strippers, sugarcane harvesters, harvesting front-end equipment, sugarcane loaders, pull-behind scrapers, and tillage and seeding equipment, as well as application equipment, including sprayers and nutrient management, and soil preparation machinery for grain growers.

The Small Agriculture and Turf segment offers utility tractors, and related loaders and attachments; turf and utility equipment, including riding lawn equipment, commercial mowing equipment, golf course equipment, and utility vehicles, as well as implements for mowing, tilling, snow and debris handling, aerating, residential, commercial, golf, and sports turf care applications; other outdoor power products; and hay and forage equipment. This segment also resells products from other manufacturers. It serves dairy and livestock producers, crop producers, and turf and utility customers.

The Construction and Forestry segment provides a range of backhoe loaders, crawler dozers and loaders, four-wheel-drive loaders, excavators, motor graders, articulated dump trucks, landscape, and skid-steer loaders, milling machines, pavers, compactors, rollers, crushers, screens, asphalt plants, log skidders, log feller bunchers, log loaders and forwarders, log harvesters, and attachments, and roadbuilding equipment.

The Financial Services segment finances sales and leases agriculture and turf, and construction and forestry equipment. It also offers wholesale financing to dealers of the foregoing equipment, and extended equipment warranties, as well as finances retail revolving charge accounts.



(2022 E Data annualized with 9 months numbers)

2. Corporate Governance and Shareholder Analysis

As of December 9th, 2022 the capital structure of Deere & Company is as follows with Institutional Investors holding close to 68% of total shares outstanding, mainly Investment Banks, Asset Managers, Universal Banks, Insurance Companies and Bill Gates, among others. Below find details of Institutional ownership versus insiders and top institutional investors, holding up to 44% of total shares outstanding.

Table 1: Institutional & Insider Ownership		Table 2: Top Institutional Shareholder				
DE Stock Institutional Ownership and Insider Ownership - Deere & Co		Holder	Shares	Report Date	% of Shares Outstanding	Market Value(\$1000)
301.82 (Mil)		VANGUARD GROUP INC	22,093,821	2022-09-30	7,32	9,606,614
Shares Outstanding		BlackRock Inc.	18,648,657	2022-09-30	6,18	8,108,623
67.72%		JPMORGAN CHASE & CO	12,969,768	2022-09-30	4,30	5,639,385
204.40 (Mil)		STATE STREET CORP	10,815,160	2022-09-30	3,58	4,702,540
Institutional Ownership		Vanguard Total Stock Market Index Fund	8,207,166	2022-09-30	2,72	3,568,558
0.95%		Vanguard 500 Index Fund	6,304,850	2022-09-30	2,09	2,741,412
2.86 (Mil)		WELLINGTON MANAGEMENT GROUP LLP	6,001,216	2022-09-30	1,99	2,609,389
Insider Ownership		JANUS HENDERSON GROUP PLC	5,117,290	2022-09-30	1,70	2,225,049
99.90%		GEODE CAPITAL MANAGEMENT, LLC	4,719,529	2022-09-30	1,56	2,052,098
301.5221 (Mil)		BANK OF AMERICA CORP /DE/	4,574,032	2022-09-30	1,52	1,988,835
Float Percentage of TSO		MORGAN STANLEY	4,022,050	2022-09-30	1,33	1,748,828
		FMR LLC	3,964,799	2022-09-30	1,31	1,723,934
		Bill Gates	3,917,693	2022-09-30	1,30	1,703,452
		PARNASSUS INVESTMENTS, LLC	3,741,007	2022-09-30	1,24	1,626,627
		NORTHERN TRUST CORP	3,271,732	2022-09-30	1,08	1,422,582
		Capital World Investors	3,239,417	2022-09-30	1,07	1,408,531
		STATE FARM MUTUAL AUTOMOBILE INSURANCE CO	3,096,934	2022-09-30	1,03	1,346,578
		SPDR S&P 500 ETF TRUST	3,019,406	2022-09-30	1,00	1,312,868
		Fidelity 500 Index Fund	2,994,262	2022-08-31	0,99	1,301,935
		Nuveen Asset Management, LLC	2,976,535	2022-09-30	0,99	1,294,227
			133,695,324		44,30	58,132,064

Source: Gurufocus (December 9th, 2022)

Source: Gurufocus

Based on these tables and data, the marginal investor in Deere & CO is well diversified.

The Board of Directors of Deere & Co has 11 members, all independent members from different industries, except for John C. May II, current Chairman & CEO. Excluding the executive member, the Board composition is diverse with 40% of female members. Board members bring great expertise to the company from different global sectors: Aerospace and Aircraft, Commodity Markets, Operating & Manufacturing Processes, Financial Services & Asset Management, Leadership & Communications and Politics. In my opinion, The Board is well diversified, reasonable sized adding great know-how to the company.

Board members in many cases are newcomers to the company. 70% of members joined the company in 2015, while Chairman & CEO was appointed in 2019.

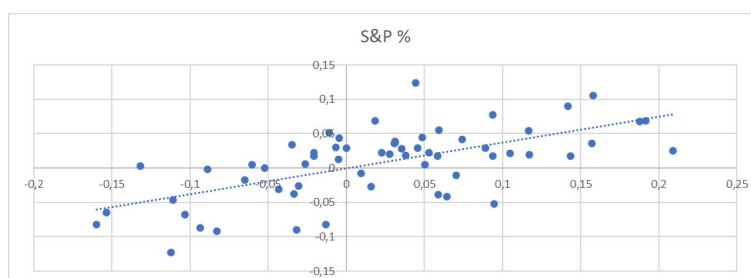
I think Deere & Co has implemented a good Corporate Governance Structure:

- Reasonable and diverse size of the Board (only one Executive) made of outsiders
- It seems that there is a reasonable turnover of Board Members
- Proven management and leadership skills (based on professional profiles)

Top executives currently hold a 0.13% of the outstanding shares which suggests a clear alignment with the long-term goals of the company and value creation for investors.

3. Risk and return at Deere & CO

I have calculated a regression Beta for Deere & Co for a 5-year period, from September 2017 to September 2022, using monthly observations (returns plus dividends included) against the S&P 500 index.

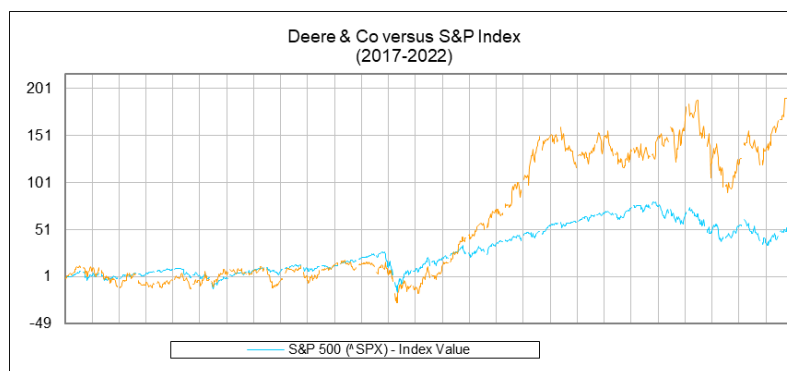


The analysis reveals that Deere's stock outperformed the market (S&P 500) by an annual return of 26% during those five years. Below there is a graph that compares Deere & Co versus S&P 500 during that period:

Regression Monthly Returns		
Return on Deere=	$0,012379804 + 1,057467764 \cdot \text{ERP}$	$R^2 = 0,63$
Standard error		0,07
Observations		60
Annualized Average Risk Free Rate (T-Bill)		1,50
Monthly Risk Free Rate		0,12
Actual Intercept		1,24%
Risk free rate* (1-Beta)		-0,72%
Jensen Alpha		1,95%
Deere did better than expected per month, between Sept-2017 to Sept-22		
Deere's annualized excess return		26,1%

If we consider the regression beta of Deere & Co (Consolidated) of 1.06, the 10-year US Risk Free rate of 3,51% and a weighted ERP Of 5.21%, **the cost of Equity of Deere & CO would be 9,03%%, on a consolidated basis.**

As a result of the standard error obtained in the regression, we can expect Beta to be in the range: (0,92; 1,2)



However, Deere & Co is a multinational with two interconnected but very different business segments:

- (1) **Equipment Manufacturing:** Global diversified division. For this business segment I have calculated the WACC, using the bottom-up market capitalization weighted unlevered beta of the peer group (14 companies) and the Equity Risk Premium weighted by both regional revenues and operating profits. Then I have calculated the levered Beta using the D/E ratio of the manufacturing unit. **(Beta Unlevered 0,83 & Beta Levered 0,87)**

Equity Risk Premium			
United States	51%	4,2%	2,1%
Canada	6%	4,2%	0,3%
Western Europe	16%	5,2%	0,8%
Central Europe & CIS	7%	7,4%	0,5%
Latam	11%	9,1%	1,0%
Asia, Africa, Australia & New Zeland, Middle East	11%	7,9%	0,9%
100%		5,5%	

	Beta by División	
	Levered	Unlevered
Financial Services	0,93	0,15
Farming	1,1	0,83

- (2) **Financial Services:** mainly US focused. For this segment I have calculated the cost of equity, using the beta levered of a financial service company (0,93)

For the WACC calculation, I have considered a marginal tax rate in the US of 40%, a synthetic cost of debt based on current risk-free rate (10-year US Treasury bond 3,51%), % D/E of manufacturing division, coverage ratio and default spread. The following table summarizes the calculations:

Cost of Debt	
% D/E	9,50%
Coverage Ratio	19,1 X
Default Spread	0,67%
Marginal Tax	40%
After Tax Cost	2,51%

Once after-tax cost of debt and cost of equity have been calculated, we compute the cost of capital for Deere & Co.

4. Cost of Capital and Optimal Debt to Equity

Once we have calculated the cost of equity and cost of debt (after tax), next step is to analyze the current debt to equity ratio of Deere & Co Manufacturing División and the sensitivity of the Cost of Capital to changes in financial leverage. The following tables describe this exercise:

Debt Ratio	Debt	Int. Expense	Coverage	EBIT	Rating	Pre tax cost	l arginal Tax	After Tax cost
0%	-	-		7.037	Aaa/AAA	4,18%	40%	2,51%
9,50%	9.822	368	19,1	7.037	Aaa/AAA	4,18%	40%	2,51%
10%	10.340	432	16,3	7.037	Aaa/AAA	4,18%	40%	2,51%
20%	20.680	896	7,9	7.037	A1/A+	4,33%	40%	2,60%
30%	31.020	1.442	4,9	7.037	A3/A-	4,65%	40%	2,79%
40%	41.360	1.984	3,5	7.037	Baa2/BBB	4,80%	40%	2,88%
50%	51.700	2.815	2,50	7.037	Ba2/BB	5,44%	40%	3,27%
60%	62.040	3.513	2,0	7.037	B2/B	5,66%	40%	3,40%
70%	72.381	8.169	0,86	7.037	Ca2/CC	11,29%	34%	7,40%
80%	82.721	10.183	0,7	7.037	C2/C	12,31%	28%	8,91%
90%	93.061	13.275	0,53	7.037	C2/C	14,27%	21%	11,24%
100%	103.401	14.751	0,5	7.037	C2/C	14,27%	19%	11,54%

D/E	Beta Levered	D/(D+E)	Cost of Equity	Cost of Debt (af. Tax)	WACC	Firm Value
0%	0,82	0	8,1%	2,51%	8,05%	104.716
10%	0,87	9%	8,3%	2,51%	7,79%	110.317
20%	0,92	17%	8,6%	2,60%	7,60%	115.065
30%	0,97	23%	8,9%	2,79%	7,47%	118.449
40%	1,02	29%	9,1%	2,88%	7,35%	121.552
50%	1,07	33%	9,4%	3,27%	7,36%	121.191
60%	1,12	38%	9,7%	3,40%	7,33%	122.218
70%	1,17	41%	10,0%	7,40%	8,90%	89.588
80%	1,22	44%	10,2%	8,91%	9,64%	79.625
90%	1,27	47%	10,5%	11,24%	10,85%	67.355
100%	1,32	50%	10,8%	11,54%	11,16%	64.822

In my view, from a financial leverage perspective, Deere & Co on a consolidated basis is biased by its Financial Services Division high financial leverage. Considering the manufacturing unit on a stand-alone basis, the D/E ratio decreases below 10%. This could leave room for additional leverage which could increase the firm value, up to a maximum level of 40% D/E. This could be a future opportunity (once the company becomes a major player in the precision agriculture) to increase debt and probably improve the compensation to shareholders, via dividends or share buybacks.

If Deere & Co decides to increase debt in the future, I think they should link the duration of this new debt to its product life cycle which tends to be 4-5 years, when farmers tend to upgrade their equipment and keep investing on becoming the next generation of agricultural equipment manufacturing, leveraging in software development, precision equipment and probably electrical equipment.

For many years, Deere & Co has been reporting the individual financial statements of both the Manufacturing and Financial Services Division. The company should make big efforts to differentiate the nature of each business while stressing the clear synergies between them. I think the financial leverage of the Financial Service Company is increasing the perceived risk of the Manufacturing Division at the Consolidated level.

An increasing level of debt, could yield some benefits to Deere & Co:

- Tax benefit
- Additional discipline while maintaining flexibility
- Keep bankruptcy costs under control
- Low agency cost given Deere financial strength and cash flow generation

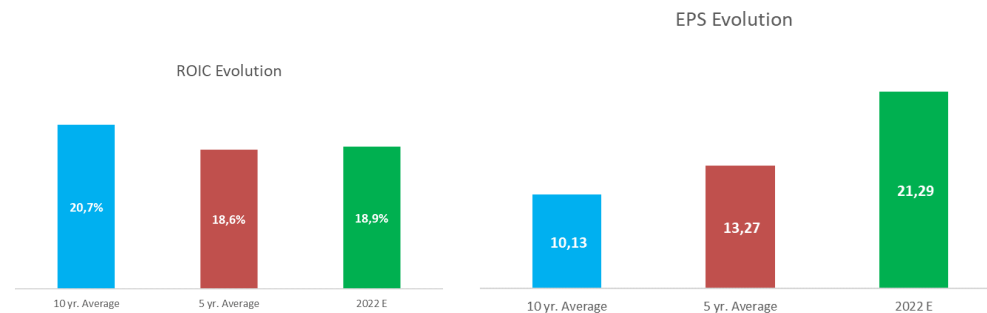
5. WACC and Return on Capital

Deere & Co is a company that invests every year on R&D to improve and upgrade its existing models, to invest in precision agriculture and to develop state-of-the-art software to incorporate in its equipment and machinery.

To maintain this level of resources deployed every year, it requires to get a Return on Invested Capital higher than its cost of capital. Deere & Co has been able to beat the cost of capital in its investments on a regular basis. This is one of the reasons of its leadership position in the agricultural equipment industry and strong dealership network. Not only Deere sells equipment, but it offers maintenance services, spare parts and also it finances both retail buyers and dealers' inventory. Those are key factors why it enjoys sustainable competitive advantage.



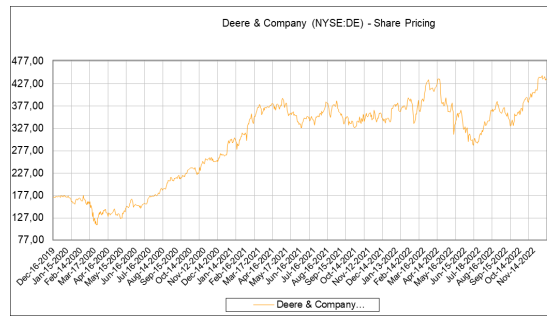
If we look at Deere & Co expertise of managing investments, this is what the numbers tell us: consistent ROIC above the cost of capital



6. Dividend Policy: Deere & Co takes care of shareholders?

I have analyzed the Dividend Policy of Deere & Co from the Manufacturing División to isolate the financial leverage decisions of the Financial Services Company. As we know, the Financial Services Company pays regular dividends to the parent company which then pays dividends to Deere & Co shareholders.

Deere & Co has returned cash to its shareholders every year (for the period analyzed 2012- 202) both in terms of dividends and buybacks, at an average of \$2.1bn per year, 69% of the FCF to Equity. If we also consider that the share price has been going up in the last three years, total return to shareholders has become very relevant.



Analysis of Past Dividends											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Aggregate
Net Income	3.065	3.538	3.162	1.940	1.524	2.159	2.369	3.253	2.751	5.963	29.723
- (Capex-Depretiation)	(673)	(506)	(249)	104	(38)	(37)	(5.164)	(103)	134	(46)	(6.578)
-Change in WC	(317)	804	1.134	141	483	36	(1.245)	(821)	495	(308)	401
FCF to Equity	2.074	3.835	4.047	2.185	1.969	2.158	(4.040)	2.329	3.380	5.609	23.547
+ Net Debt Issued	2.266	128	(824)	4	(107)	1.105	2	227	3.802	(18)	6.585
= FCF to Equity (actual debt)	4.340	3.963	3.223	2.189	1.862	3.263	(4.038)	2.556	7.182	5.591	30.131
Dividends	698	753	786	816	761	764	806	943	956	1.040	8.323
+ Equity Repurchases	1.588	1.531	2.731	2.771	205	6	958	1.253	750	2.538	14.331
-Issuance of common stock	(61)	(175)	(150)	(172)	(36)	(529)	(217)	(178)	(331)	(148)	(1.997)
= Cash to shareholders	2.225	2.110	3.367	3.415	930	241	1.547	2.018	1.375	3.430	20.658
Dividend Ratios											
Payout Ratio	23%	21%	25%	42%	50%	35%	34%	29%	35%	17%	28%
Cash Paid as % of FCFE	51%	53%	104%	156%	50%	7%	-38%	79%	19%	61%	69%

7. Valuation

I have applied the following approach to value Deere & Co: sum of the parts. I have isolated the financial leverage of the Financial Services Company from the Manufacturing Business, and valued both Divisions separately:

- **Financial Services Division:** given it is a captive subsidiary that pays a reasonable stream of dividends each year to its parent, it is a well-run reliable company with sound credit profile, low credit losses, well capitalized and high ROE, I have used a dividend discount model.
- **Equipment División:** DCF valuation (FCF to the firm) at the cost of capital of the Division

Financial Services División (Valuation Summary)

	Growth Phase	Transition Phase	Stable Growth Phase
Length of Period	5 years	5 years	Forever after 10 years
Payout	63%	gradually up to 80%	80%
Growth Rate	7%	gradually to 3%	3%
Beta	0,93	0,93	0,93
ERP	4,24%	4,24%	4,24%
Cost of Equity	7,50%	7,50%	7,50%

	Dividend Discount Valuation									
	2.023	2.024	2.025	2.026	2.027	2.028	2.029	2.030	2.031	2.032
Net Income	1.237	1.324	1.416	1.515	1.621	1.722	1.814	1.896	1.965	2.024
% growth Rate	7,0%	7,0%	7,0%	7,0%	7,0%	6,2%	5,4%	4,5%	3,7%	3,0%
Book Value of Equity	7.933	8.423	8.947	9.507	10.107	10.686	11.234	11.742	12.202	12.607
ROE	15,6%	15,7%	15,8%	15,9%	16,0%	16,1%	16,1%	16,1%	16,1%	16,1%
Dividends paid	779	834	892	955	1.021	1.143	1.266	1.388	1.505	1.619
Payout Ratio	-63,0%	-63,0%	-63,0%	-63,0%	-63,0%	-66,4%	-69,8%	-73,2%	-76,6%	-80,0%
Retention Ratio	37%	37%	37%	37%	37%	34%	30%	27%	23%	20%
Expected Growth	7,0%	7,0%	7,0%	7,0%	7,0%	6,2%	5,4%	4,5%	3,7%	3,0%

Ke	7,5%	7,5%	7,5%	7,5%	7,5%	7,5%	7,5%	7,5%	7,5%	7,5%
Com. Ke	1,07	1,15	1,24	1,33	1,43	1,54	1,65	1,78	1,91	2,05
Discount factor	0,93	0,87	0,81	0,75	0,70	0,65	0,60	0,56	0,52	0,49
PV FCFE	725	722	719	716	713	743	765	781	788	789

Terminal Value	
g	3,0%
ROE	16,0%
Beta	0,93
RIR	18,8%
Payout	81,3%
Net Income	
Year 2033	2.085
Dividends	1.694
Terminal Value	38.035

Present Value	
Dividends	7.462
Terminal Value	18.535
Value Equity	25.997

Cost of Equity	
Risk Free	3,51%
Beta	0,93
ERP	4,24%
Ke	7,5%

Manufacturing Division (Valuation Summary)

- WACC calculation for Manufacturing Division:

To calculate the cost of capital of the Manufacturing Operations, I have used the market values of both Equity and Debt. I have derived the market value of the Equity of the Equipment Segment by subtracting the total market capitalization of the Consolidated Business minus the intrinsic value of the Financial Services Equity.

To calculate the business beta, I have used the 5-year unlevered beta of 14 comparable companies in the sector and I have applied the current D/E of the manufacturing business. Since the current D/E of Deere Equipment Division is low, I have considered that it can increase the %D/E to 20% in the mature phase to enhance the Firm Value.

Market Value of Debt	9.886
Face Value Debt	10.434
Interest expense	368
Risk free rate	3,51%
Default spread	0,67%
YTM	4,18%
Average Maturity	10 years

Risk Free Rate	3,51%
ERP	5,5%
Beta Manufacturing Business	0,87
Cost of Equity	8,31%
Pre tax Cost of Debt	4,18%
Default spread	0,67%
Marginal Tax rate	40%
After tax cost of debt	2,51%

Market Value of Equity	131.230
Value of Financial Services	25.997
Market Value Manufacturing	105.233

MV Equity	105.233	91,4%
MV Debt	9.886	8,6%
Capital	115.119	100,0%
D/E		9,39%

WACC	7,81%
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	Growth Phase	Transition Phase	Stable Growth Phase
Length of Period	5 years	5 years	Forever after 10 years
ROIC	25%	gradually up to 12.5%	12,5%
RIR	20%	gradually up to 24%	24,0%
Growth Rate	5%	gradually to 3%	3%
% D/E	9,30%	gradually to 20%	20%
Tax rate	25%	25%	30%
Cost of Debt after tax	2,51%	2,60%	2,60%
Cost of Equity	8,30%	8,60%	8,60%
Beta	0,87	0,92	0,92
WACC	7,81%	7,60%	7,60%

Free Cash Flow	2.023	2.024	2.025	2.026	2.027	2.028	2.029	2.030	2.031	2.032
Operating Income	8.558	8.986	9.435	9.907	10.402	10.881	11.338	11.769	12.169	12.534
- Provision for taxes	(2.140)	(2.246)	(2.359)	(2.477)	(2.601)	(2.720)	(2.834)	(2.942)	(3.042)	(3.133)
NOPAT	6.419	6.739	7.076	7.430	7.802	8.161	8.503	8.827	9.127	9.400
-Reinvestment	(1.284)	(1.348)	(1.415)	(1.486)	(1.560)	(1.668)	(1.786)	(1.917)	(2.069)	(2.256)
FCF to the Firm	5.135	5.392	5.661	5.944	6.241	6.492	6.718	6.910	7.058	7.144

ROIC	25%	25%	25%	25%	25%	22,5%	20,0%	17,5%	15,0%	12,5%
RIR	20%	20%	20%	20%	20%	20,4%	21,0%	21,7%	22,7%	24,0%
Expected Growth	5%	5%	5%	5%	5%	4,6%	4,2%	3,8%	3,4%	3,0%
Taxes	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
WACC	7,8%	7,8%	7,8%	7,8%	7,8%	7,6%	7,6%	7,6%	7,6%	7,6%
D/E	9,3%	9,3%	9,3%	9,3%	9,3%	20,0%	20,0%	20,0%	20,0%	20,0%
Cumulative	1,08	1,16	1,25	1,35	1,46	1,57	1,69	1,81	1,95	2,10
Discount factor	0,93	0,86	0,80	0,74	0,69	0,64	0,59	0,55	0,51	0,48
PV of FCFs	4.763	4.639	4.518	4.400	4.285	4.143	3.984	3.809	3.616	3.402

Terminal Value	140.718
FCF year 11	6.468
g	3%
WACC	7,6%
Taxes	30%
ROIC	12,5%
RIR	24%
NOPAT Year 11	8.511
PV of FCF	41.558
PV Terminal Value	66.999
Enterprise Value	108.557

Deere & Co

The intrinsic value per share of Deere & Co (on a consolidated basis) has been calculated as follows:

- Value of Operating Assets of Manufacturing Company (108.564 \$M) minus Net Debt of Manufacturing Company (6.894 \$M) and Minority Interests (3 \$M)
- From the annual report, I have obtained the number of options outstanding to employees and their fair value (376 \$M)
- I have reached to the intrinsic value of the equity of the manufacturing business (101.290 \$M)
- By adding the equity value of the Financial Services (25.997 \$M), I arrived at the total equity value of the company (127.287 \$M)

Value of Deere & Co (\$Million)	
Operating Assets Manufacturing	108.564
- Debt	10.434
- Minority Interest	3
+ Cash	3.540
- Value of Options	376
Value of Equity in Common Stock	101.290
Value of Equity Financial Services	25.997
Total Value of Equity	127.287
Shares Outstanding	301,8
Estimated Value per share	421,7
Price per share (Dec 16th)	429,8