

**Financial Dashboard**

DE

**Dashboard Summary**

\$M, unless otherwise stated

**TRADING STATISTICS**

Share price (\$) - 7/22/2016	\$80.32
Shares outstanding (M)	316.5
Market cap	25,421.3
Net debt	33,257.1
Enterprise value	58,678.4

**EPS VALUATION**

	Base	Upside	Downside
EPS 2017	\$3.47	\$5.64	\$2.68
P/E	17.0x	16.0x	20.0x
Stock Price (\$)	\$59.00	\$90.28	\$53.69
Probability	50.0%	20.0%	30.0%
Disc/(Premium):	(26.5%)	12.4%	(33.2%)

Weighted Average Price (\$):	\$63.66
Disc/(Premium) to Current Price:	-20.7%

**BASE CASE FINANCIALS / METRICS**

	2011	2012	2013	2014	2015	Projected	
						2016	2017
Net Sales	29,466.1	33,500.9	34,997.9	32,960.6	25,775.2	23,978.2	22,628.7
Consensus							23,164.2
EBITDA	4,648.4	5,279.6	6,070.8	5,460.5	3,283.1	2,717.2	2,205.4
Consensus							2,376.0
EPS (\$)	\$6.63	\$7.71	\$9.34	\$8.74	\$5.77	\$3.68	\$3.47
Consensus						\$4.00	\$4.15
FCF (\$)	1,269.7	(151.5)	2,095.9	2,477.6	3,046.3	1,659.0	1,692.6
Revenue growth		13.7%	4.5%	-5.8%	-21.8%	-7.0%	-5.6%
EBITDA margin	15.8%	15.8%	17.3%	16.6%	12.7%	11.3%	9.7%
EPS growth		16.2%	21.1%	-6.4%	-34.0%	-36.2%	-5.7%
EV/Revenue				1.8x	2.3x	2.4x	2.6x
EV/EBITDA				10.7x	17.9x	21.6x	26.6x
P/EPS				9.2x	13.9x	21.8x	23.1x
Levered FCF Yield %				9.7%	12.0%	6.5%	6.7%

**Investment Overview and Business Description**

Deere is the global leader in agricultural equipment with dominant position in North America (~50%) and 20-30% share in most international markets. The firm primarily sells tractors and combines to independent dealers who then sell direct to consumer. Deere also offers equipment leasing and credit through its captive arm, John Deere Financial.

**The industry is highly cyclical and has enjoyed a historic run over the past seven years fueled by cheap credit, ethanol tax incentives, Chinese demand, and record-breaking grain prices as a part of the larger commodity “super-cycle.”** Farmer incomes and cash receipts peaked in 2013 as corn traded to \$8/bushel and the value of Iowa farmland has more than quadrupled since the 1990’s. Today, farmland value as a multiple of farmer income is now in the 30-35x range, the highest level since the 1970’s and far above the historical average of 22x.

**This up-cycle has led to many seasons of tractor demand being pulled forward** as farmers purchased brand new equipment before each crop year, motivated by cheap financing and ‘one-off’ benefits such as Section 179 bonus depreciation (repealed in 2014). This allowed a farmer to immediately deduct 50% of the tractor cost as a tax shield and thus encouraged new purchases whether the equipment was truly needed or not. Industry-wide sales of 100 HP+ tractors (to which DE’s equipment revenues have ~95% correlation) more than doubled over the course of the cycle from 20k in 2006 to 42k in 2013, and Deere enjoyed record-breaking sales as 75% of their consolidated revenues are from large ag equipment.

**Needless to say, Deere over-earned during this period.** Grain prices have now fallen 45-50% from peak, pressuring farmer budgets and leaving most operating below cash-breakeven. The industry is entering what management states is likely to be “the worst ag down-cycle in 25 years” and farmers have cut back on discretionary purchases such as large tractors. New equipment sales have declined as the average tractor age is now the youngest in 30 years (15% of the fleet is under five years of age) and there is a glut of heavily-discounted used equipment working its way through the system, with dealer inventory/sales ratios running 25-30% above 10-year averages. **As such, Deere faces significant headwinds and earnings are set to decline over the next 24+ months as they cut production and potentially pricing in response to general industry oversupply.**

**These lower sales and margins also hurt their financing arm, which has grown to represent 1/3<sup>rd</sup> of DE’s net income as historically cheap rates boosted net interest margins.** Deere has made an incredibly risky decision in response to the glut, propping up pricing in the used market via operating leases and taking equipment onto their own balance sheet. This represents a painful tail risk in the event the downturn severely worsens and Deere Financial suffers massive losses. As used equipment prices continue to decline, DE will be forced to write-down residual values which in turn leads to higher depreciation expense and drags on earnings. DE’s provisions for credit losses are also at all-time lows heading into a downturn (13 bps versus 50 bps historical average) which will be a further drag on EPS as they are adjusted higher.

**This is the early stages of a classic boom-bust cycle and ag equipment dealers like DE are set for a prolonged period of depressed earnings.** If 100HP+ tractor sales run just 10% below average for the next three years and used equipment prices continue declining 5% y/y, Deere will earn roughly \$3.50 in FY17; a 60% decline from peak earnings and a 25% decline in share price using conservative multiples (16-17x).

### Thesis Overview

1. **Deere is heading into the worst agriculture downturn since the 1980's.** The past seven years are not representative of a regular up-cycle as the boom was driven by temporary factors such as ethanol tax incentives, China demand, bonus depreciation and historically low-interest rates. Farmer incomes and cash receipts are declining along with farmland prices, and this will directly impact Deere via lower large tractor sales and decremental margin pressure.
  - From 1990 to 2006, an average of 18k 100HP+ tractors were sold per year. The average from 2007-2014, when this current boom began, was 28k with a high of 37k sold in 2013. This spike in sales has all been in the face of productivity improvements and total farmland acreage held constant, meaning less tractors are now needed to harvest the same amount of land.
  - Used 100HP+ Tractors are building up at dealers, with inventory-to-TTM sales ratios running 25% above 10-year averages. Recent searches on tractorhouse.com show that ~7k of the ~12k 175+HP tractors built after 2010 for sale were Deere brand (58%) along with above 50% of the 100-174HP variety.
2. **Conservatively, industry tractor sales will likely decline 15% y/y to hit 21k in FY17 (the 25-year average, excluding the 1980's bust); the real number will be lower, especially if crop prices continue to decline.** Combined with Deere operating margins reverting to pre-2007 levels (6-7%), true mid-cycle EPS for DE is likely in the \$3.50-\$4.00 range which suggests 20-30% downside at a 16-17x multiple; earnings will likely drop below \$3.50 as the bear market worsens and DE is forced to slow their buyback. This reward setup is paired with fairly low risk to the upside, with the stock pricing in a near-term recovery which will not materialize for years.
3. **Free 'put option' in Deere's finance arm suffering a decline in profitability** should rising rates leads to further net interest margin compression, along with higher credit loss provisions and depreciation expense.
  - Provisions for credit losses are far below historic averages (13 bps vs 50 bps average) and are set to increase in FY16. Management will be forced to write-down residual values from 60% currently to 55% or 50%, causing a spike in depreciation expense and a drag on earnings. **Deere revealed in their recent 10-K that each 10% decline in residuals translates to \$175m in incremental depreciation expense, or 25-30 cents in EPS.**
  - In an extreme downside scenario, farmer defaults will lead to significant credit losses for DE, with each 10 bp move in credit losses shaving off ~\$40-50m in pre-tax earnings or 8-10 cents in EPS.

### Variant View

- **Management has indicated that the "trough" for this downturn will be 2016**, but the recovery is likely to be L-shaped and not V-shaped as various tailwinds are unlikely to materialize even if corn prices rebound.
- **Bulls are using multiples from the past ten years as comps when these are not representative of what an actual down-cycle looks like for Deere.** In the 1980's bust, EBIT margins went negative as land values fell 50%, tractor demand fell by 60% and thousands of families lost their farms; the DE short offers attractive risk/reward even using far less draconian assumptions.
- **Many years of tractor demand have been pulled forward there is too much used supply in the system.** This is exacerbated by the fact that DE and others (AGCO, CNHI) continue to manufacture new tractors, which extends the length of the down-cycle.
- The average age of the 100HP+ tractor fleet is as young as it's been in 30 years, with ~15% of units (by management's estimate) under five years of age. The average tractor life has increased as well since the 1980's due to productivity gains and large tractors can last 15 years, up from less than 10 per Ag Census estimates.
- Used equipment values are tracking down 5% y/y and will serve to drag down the entire pricing structure as dealers are unable to alleviate the supply glut without substantial price cuts. Deere's finance arm will also have to take down residual value estimates.
- Deere's earnings and stock performance are largely tied to 100HP+ tractor sales, which are declining ~30% y/y and will continue to decline in 2016.
- **Bottom line: Even if this down-cycle isn't as bad as the 1980's, a return to 25-year average historical tractor sales + historical operating margins yields considerable downside for DE shares (20-25%) with very manageable risk.**

### Valuation and Target Price

**BASE = \$59 stock (26% downside)** – 17x \$3.47 in FY17 EPS; 21k tractor sales, 6.5% EBIT margins, 25m shares retired  
**BEAR = \$53 stock (33% downside)** – 20x \$2.68 in FY17 EPS; 18k tractor sales, 5.5% EBIT margins, 15m shares retired  
**BULL = \$90 stock (12% upside)** – 16x \$5.30 in FY17 EPS; 25k tractor sales, 8.0% EBIT margins, 30m shares retired

### Risks

- Inclement weather leads to lower yields and higher crop prices
- Farmer sentiment recovers, higher confidence leads to an uptick in discretionary purchases (tractors)
- Deere has ~\$4B in cash and share repurchases may help buoy EPS through a downturn