Do Lenders Constrain Ethanol Plant Technology Adoption?

NDSU BioEPIC Energy and Product Innovation Center

Background

This study examines a dry-mill ethanol firm's ability to invest in dry fractionation technology in the face of declining profitability and stringent lender cash flow repayment constraints. To remain competitive, ethanol plants must invest in emerging technologies such as dry fractionation. The process increases ethanol throughput, reduces the amount of the co-product dried distiller's grains with solubles (DDGS) and replaces them with high-protein DDGS, and provides corn germ as another revenue source.

How are Ethanol Plants Constrained by Lenders?

Ethanol loan covenants typically include sweeps. A sweep requires the plant to repay loan financing more rapidly when cashflow is high. This is problematic for an ethanol plant that is striving to build equity and invest in new technology

Modeling Ethanol Plant Profitability

A Monte Carlo simulation model was constructed to estimate firm profits, cash flows, and changes in equity following new investment in fractionation equipment to determine an optimal investment strategy. The model was based on a 100 million gal. ethanol plant using survey data from 7 midwestern ethanol plants and prices prevailing in North Dakota.

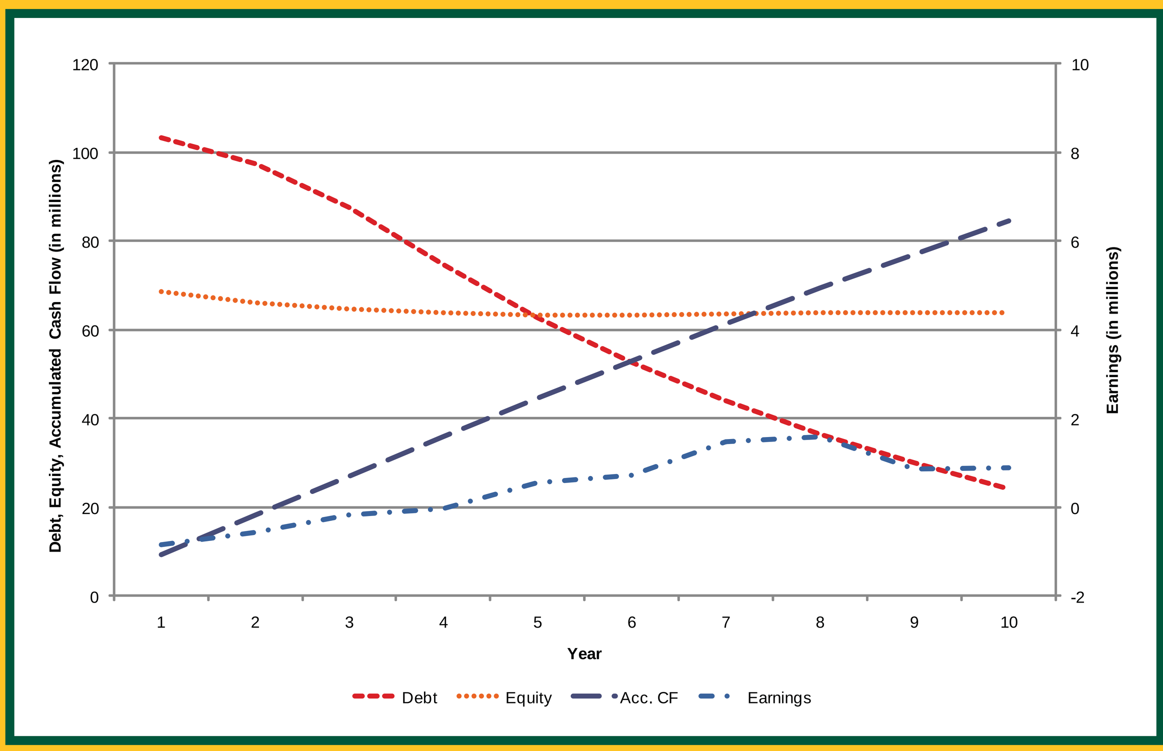
Assumptions

- Ethanol plant is a 15-year depreciable asset
- Assume miscellaneous variable costs are constant
- Simulate ethanol profits for 10 years
- Fractionation investment occurs in Year six if firm possesses sufficient cash

Conclusion

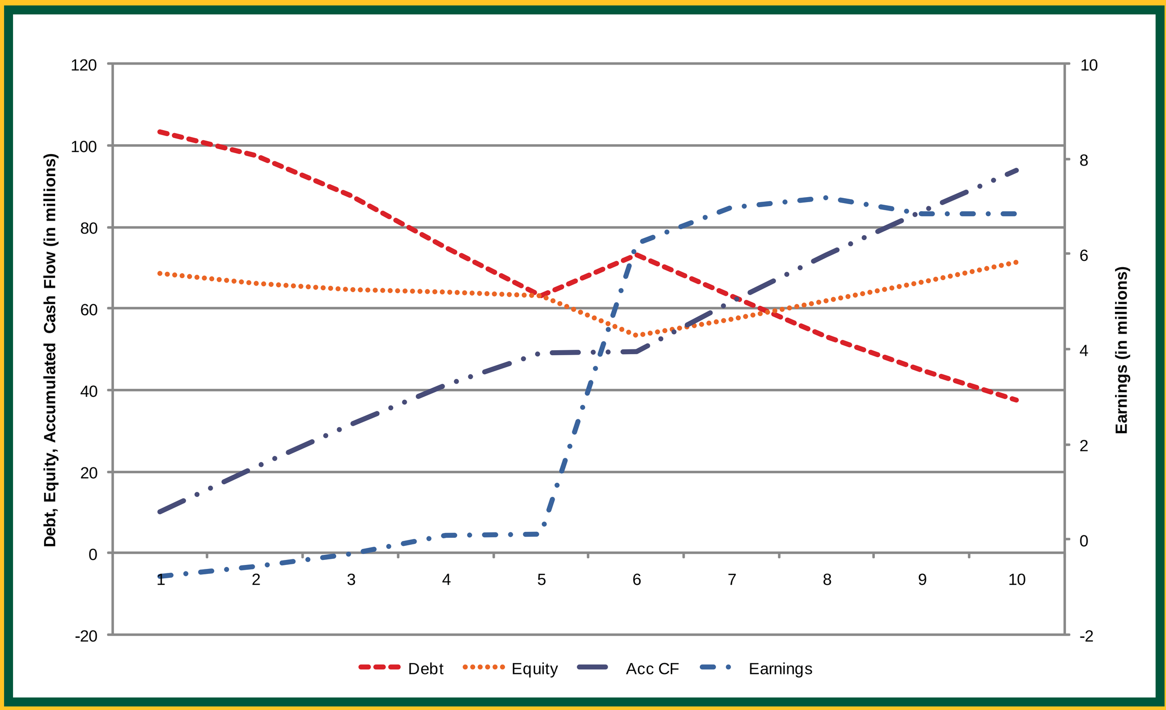
While ethanol firm profits are uncertain, the lender's imposition of a sweep combined with increased profit from dry fractionation technology help the firm increase long-run financial resiliency.

Base Scenario



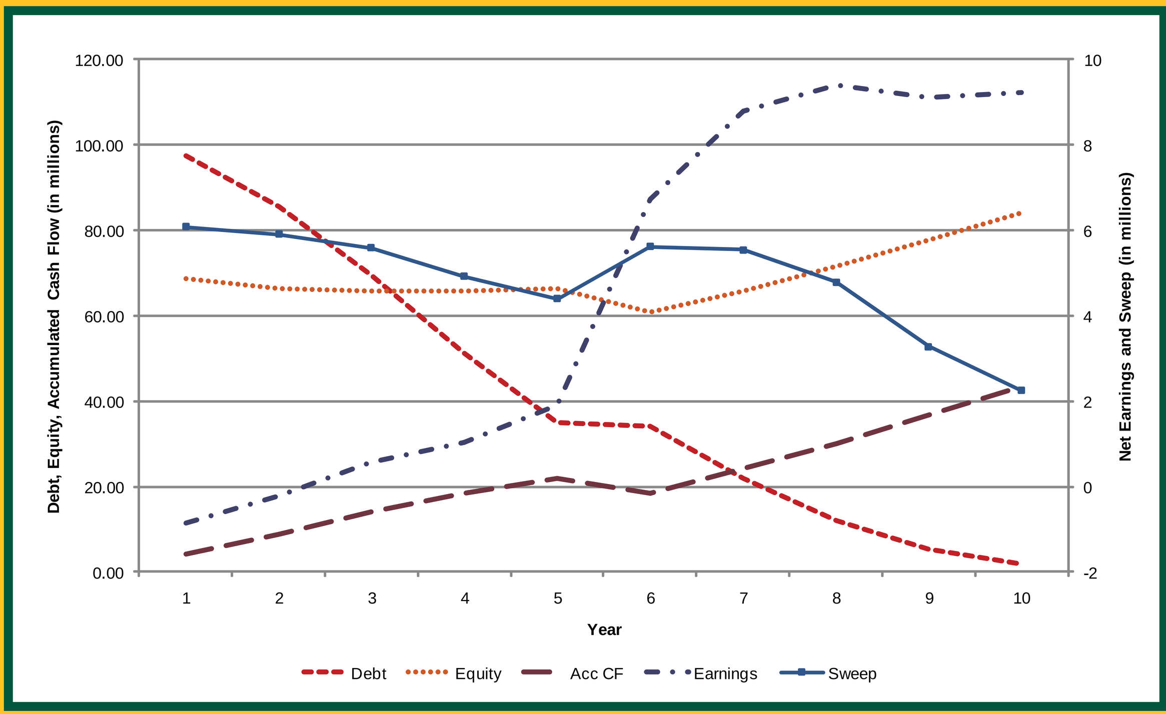
- Earnings are initially negative, but increase over time
- Equity generally declines due to low profitability
- Debt steadily declines with schedule repayments

Fractionation, No Sweep



- Plant invests in fractionation in year 6 and profits increase substantially
- Debt increases in year 6 following investment, but declines thereafter
- Equity increases over base scenario due to higher profitability

Fractionation with Sweep Imposed



- Debt is paid off very quickly
- With lower financing costs, plant profits are higher
- Ending equity is highest compared with other scenarios

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