Strategic Risk Management in Agriculture

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Risk management is not a checklist; it is a mentality that needs to be top-of-mind.

– Frederick W. Smith, Chairman and CEO
FedEx Corporation

Source: Choices, 4th Quarter 2013
Need to Know the Costs

- Costs are Determined by Industry Structure
- Difficult if You Don’t Know Costs of
  - labor
  - water, seed, fertilizer, feed, services
  - regulation
  - equipment
  - maintenance
  - shipping
- Most Don’t Know Cost of an Important Input
What Does Money Cost?

- Very Important Input
  - what does money cost?
  - \( A = L + E \)
  - \( WACC = w_d r_d (1 - t) + w_e r_e \)
- Risk is High, Cost of Capital is High

Interest Rates, 1962 to 2015

[Graph showing interest rates from 1970 to 2015]
Risk and Uncertainty Are the Rule

- Risk and Uncertainty Misunderstood
- Tendency to Confuse Risk and Uncertainty
- Risk is Quantifiable; Uncertainty is Not
  - we can see it; if we can’t see it, it is unknown
  - need to manage both
- Uncertainty
  - regulations and policies
  - natural disasters
  - family mishaps
  - global trade
  - economic, political, social, environmental
Expect Greater Uncertainty Ahead

- Typical Responses
  - increase focus on managing revenue
  - build up finances
  - pay down debt; deleverage; restructure; sell assets
  - reduce time exposure to risk
  - try to time markets
- Benchmark: Do Nothing; Hope for the Best
- Risk Management Components
  - production (insurance – crop, p & c, health, life)
  - marketing, financial, legal, personal
- All Part of Strategic Business Plan

Broad Trends Driving Risk

- Global Demand for Agricultural Products
  - growth rate of 2% to 3% per year
- Increasing Productivity in Agriculture
  - yield growth rate of 0.5% to 1.0% per year
  - needs to grow 1.5% per year to keep up with population growth
- Ag Biotech
  - could increase productivity rate to 3% to 3.4% per year by 2030

Sources: The Economist
Federal Reserve Bank of Kansas City
What Risks to Manage?

• Financial and Market Risk Are Most Familiar
  – faced by most actors in supply chain
  – common tools and strategies available
• Many Variables to Consider
  – what is the scope of your market?
    – global, international, national, regional, local
  – who are your financial partners?
    – Farm Credit West, others (commercial, local, regional, national, too-big-to-fail)

Conventional Risk Management

• No Risk, No Reward
  – no one has problem with prices going up
  – when prices go down there is trouble
  – can’t have one without the other
• Ag Risk Understood Generally in Terms of
  – prices $\times$ yields = revenues
• Result: Risk Management Focus on Revenues
• Need to Focus on Margins
Two (Related) Types of Ag Risk

• Operations and Financing
  – price, cost, and yield
  – debt (including interest expense)
• Debt Financing Links Them
  – operational debt for cultural costs
  – debt incurred to cover thin or negative margins
• Address Margin Risk Perspective
  – revenue is volatile; function of price and yield
  – costs are less volatile
  – margin risk results

What About Costs?

• Must Manage Revenue Side
• Costs are Major Source of Risk
  – land, fertilizer, energy, water, seed, weather, pests, disease, regulations, technology, food safety, foreign currency
  – all require management
Risk Represents a Cost

- Your Business is a Portfolio of Assets
  - assets have value $(A = L + E)$
- Risk is About Future Losses
- Managing Future Losses Incurs Costs Today
  - insurance, opportunity, loss of assets, capital losses, etc.
- Risk Reduces Present Value of Firm
  - increased cost of capital
  - other, unforeseen, costs

Where Are You in the Big Picture?

- Risk Depends on Industry Structure
- Supplier? Buyer? Producer? Distributor?
- Substitute Products? Complementary Products?
- What Are Their Specific Risks?
- How Do Risks Differ by Role in Industry?
- How Do You Fit into Supply Chain?
Risk is Part of Industry Structure

The Five Forces That Shape Industry Competition

- Threat of New Entrants
- Rivalry Among Existing Competitors
- Bargaining Power of Suppliers
- Bargaining Power of Buyers
- Threat of Substitute Products or Services

How Do You Fit In?

- Input Suppliers
- Producers
- Distributors
- Brokers
- Processors
- Exporters
- Retailers
- Foreign Markets
- US Markets

Source: World Bank, ARD
Hard to See the Forest for the Trees

- Risk Picture is Very Complicated
- We See Only Our Link and a Few Others
- Our Links Fail; Disaster for Us (and Possibly Others)
  - certainly trouble for others
- Their Links Fail; Disaster for Them (and Possibly Us)
  - other links fail beyond our control
  - risk? or uncertainty?

Source: http://guides.library.duke.edu/food_energy
Some Goals

• Understand Risk-Return Relationship
  – maximize returns for risks we take
  – a definition of efficiency
• Minimize Risks
  – cannot eliminate risks
• Learn from Failure
  – cannot avoid failure
• Assure Failure is not Catastrophic
  – need to manage failure

Re-examine Risk Management

• Risk Management is Strategic For System
• Need to Diversify Our View of Risk
  – what are our immediate risks?
  – what are risks of those we are linked to?
  – what are other risks in the system?
• Understand Our Risks
  – risks we take
  – risks others take that we are exposed to
• Understand Risks We Present to Others
  – risks we expose others to
Managing Margin Risk

- Operational and Financial Risks Intersect in Margins
  - low prices, high costs, low yield
  - margins indicative of risks in other areas
  - manage margins and address broader risk issues
- Important Strategic Function
  - success or failure can depend on margin management strategy
- Revenues, Input Costs, and Yields Volatile
- Margin Volatility Even Greater (2× to 4×)

Margin Risk Management Benefits

- Improve Financial Position
  - build up financial reserves
- Provides for Moderate Growth
  - costs of capital should increase in future
- Strengthens Cost Controls
- Improves Operational Efficiencies
- Requires Focus on Strategic Investments
- Makes Lenders Happy
Reconsider Treatment of Risk

- Mistake to Focus Mainly on Prices
  - ignores effect of financing and capital costs
- Must Focus on Revenues and Costs – Margins
- Margin Risk Management is Key Strategic Competence

Farm Credit Admin Guidelines

- Borrowers Should Have
  - business and marketing plans
  - a succession plan
  - hedging and insurance strategies
  - separate line of credit for risk management activities
Margins: Strategic Function

- Farms Have to Manage Margins Better
  - stabilize profit margins at some acceptable range
- Farms Become More Cost Sensitive
  - more input needed to meet additional demand
  - reluctant to let costs eat into margins
  - cut four biggest expenses
- Farms Have to Become More Efficient
  - demand same from suppliers
- Credit Becomes Harder to Acquire

Managing Margin Risk: Two Goals

- Reduction in Volatility
  - revenues
  - costs
- Maintain Revenues in Excess of Costs
  - margin will squeeze
  - avoid going negative
- Do These Simultaneously
  - that’s the trick
U.S. Farm Gross Cash Income
Total Cash Receipts Plus Other Farm-Related Income

- Record Farm Cash Receipts expected in 2012 & 2013
- Other Farm-Related Income at historic levels in 2011 & 2012 drought years
- Crop insurance indemnity payments is major component of Other Farm-Related Income


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Net farm income and net cash income, 2000-2013F

$ billion

$150

$120

$90

$60

$30

0

2000

2002

2004

2006

2008

2010

2012F

2013F

Net cash income
(and 10-year average)

Net farm income
(and 10-year average)

F = Forecast
**Farm business net cash income, 2014F compared with 2013F**

Note: F = forecast.

Source: ERS partial budget model based on the 2012 Agricultural Resource Management Survey (ARMS) using parameters from the sector forecasts. The model is static and therefore does not account for changes in crop rotation, weather, and other location production impacts that occurred after the base year. Data as of February 11, 2014.

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**Nominal and inflation-adjusted farm production expenses, 1970-2013F**

F = Forecast. Values are adjusted using the chain-type GDP deflator. 2005 = 100.

Source: Farm Income and Wealth Statistics, Economic Research Service, USDA.

Data as of February 11, 2013.
## Revenues Driven by Spot and Yield

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Spot Price</th>
<th>Yield (40 lbs per carton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>$8.10</td>
<td>850</td>
</tr>
<tr>
<td>2005</td>
<td>$7.93</td>
<td>804</td>
</tr>
<tr>
<td>2006</td>
<td>$10.76</td>
<td>725</td>
</tr>
<tr>
<td>2007</td>
<td>$12.38</td>
<td>830</td>
</tr>
<tr>
<td>2008</td>
<td>$11.93</td>
<td>824</td>
</tr>
<tr>
<td>2009</td>
<td>$9.08</td>
<td>928</td>
</tr>
<tr>
<td>2010</td>
<td>$12.88</td>
<td>983</td>
</tr>
<tr>
<td>Mean</td>
<td>$10.44</td>
<td>849</td>
</tr>
</tbody>
</table>

Forward Contract Prices Vary with Spot Price Between $11.50 and $12.50 on Sliding Scale ($0.25 Increments)

## Harvest Costs Vary (Yield Driven); Cultural Costs Fixed

### Production Costs (per Acre, Single Harvest)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed</td>
<td>$144.00</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>$329.00</td>
</tr>
<tr>
<td>Weed Control/Thinning Labor</td>
<td>$746.00</td>
</tr>
<tr>
<td>Pest Management (includes PCA costs)</td>
<td>$180.00</td>
</tr>
<tr>
<td>Irrigation Labor</td>
<td>$341.70</td>
</tr>
<tr>
<td>Irrigation Labor</td>
<td>$498.98</td>
</tr>
<tr>
<td>Fuel</td>
<td>$172.53</td>
</tr>
<tr>
<td>Tractor and Machinery Cost</td>
<td>$355.53</td>
</tr>
<tr>
<td>Pest Management and General Labor</td>
<td>$105.90</td>
</tr>
<tr>
<td>Land Rent</td>
<td>$1,100.00</td>
</tr>
<tr>
<td>Water</td>
<td>$280.00</td>
</tr>
<tr>
<td>Interest on Operating Capital</td>
<td>$38.98</td>
</tr>
<tr>
<td>Total Cultural Costs</td>
<td>$2,484.56</td>
</tr>
<tr>
<td>Harvest Costs Vary with Spot Price</td>
<td>$7,457.00</td>
</tr>
<tr>
<td>Cash Overhead per acre</td>
<td>$190.00</td>
</tr>
<tr>
<td>Total Overhead Cash Cost</td>
<td>$1,388.98</td>
</tr>
<tr>
<td>Total per Acre Cost</td>
<td>$8,776.04</td>
</tr>
<tr>
<td>Total Harvest Cost (cooling, palletize, and sell) per acre</td>
<td>$4,972.50</td>
</tr>
</tbody>
</table>
Managing Revenue Risk

Focus on Stabilizing Revenue

Managing Cost Risk

Focus on Stabilizing Costs
Managing Margins

Focus on Stabilizing Margins

No Hedge, 50% Leverage

σ_{Revenue} = $1464  σ_{Cost} = $498
Strategic Planning

In preparing for battle I have always found that plans are useless, but planning is indispensable.

−Dwight David Eisenhower

Let our advance worrying become advance thinking and planning.

−Sir Winston Churchill
Strategy and Planning: Against Our Nature

• We are Generally Bad at Planning
• We are Risk Averse
  – prefer reward to loss
  – planning forces us to anticipate risk of failure
• Short-Term Thinking and Economic Behavior
  – plan for long-term
  – extrapolating short-term is dangerous practice
• Strategy is Counterintuitive
  – plans are useless; planning is essential

Hope is Not Strategic

• Major Management Responsibility
  – operations, harvest, distribution, sales
  – operations and finance intersect in margins
  – integral part of strategic activities
  – contributes to success or failure of company
  – needs daily attention, expertise, and good information
• Risk Management is a Strategic Function
  – core competitive advantage
Strategy is a Dynamic Process

• Information, Data, Material Used for Planning are Constantly Changing
• Plan and Process Must be Continually Improved and Reinvigorated
• Internal and External Needs Change
• Feedback Loop Exists to Keep Plan Modified and Up-to-Date
• Plans are Useless; Planning is Essential

Common Decision-Making Styles

• Management by Command
  – one person makes the decisions
• Management by Team
  – leader consults others before making decisions
• Management by Extrapolation
  – always done it this way; works fine
• Management by Execution
  – solving problems is enough; reactive not proactive
• Mystery Management
  – easy to see what is done but can’t figure out why

• Formulate
  – develop statement of purpose
  – external and internal analyses
  – develop, evaluate, and select strategies
  – strategies products of SWOT analysis, not add-ons
  – strategies address factors and how to be profitable

• Implement
  – create policies and goals
  – allocate resources

• Evaluate
  – performance metrics
  – feedback information into ongoing strategic process

Formulate: Internal & External Analyses (SWOT Analysis)

• Internal: Strengths and Weaknesses
  – value chain

• External: Opportunities and Threats

• External Forces Affecting the Business
  – industry structure
  – competition and markets
  – economics, society, demographics
  – environment, politics, regulations
  – technology
Formulate: Strategy Selection

- Which is Best for Us Right Now?
- Evaluate and Prioritize Strategic Choices
- Based on Factor Analyses and SWOT
- Recognize Importance of Good Business Sense in Strategy Selection

Formulate: Financial Evaluation

- Rank Strategies Using Pricing Models
  - NPV and real options
- Important: Consider Risk of Each Strategy
  - greater risk requires greater return
  - quantitative and qualitative
- Prioritize by Value-to-Cost
  - first implement strategies with high values-to-cost and lower risk
  - lower values-to-cost and high risk later
Implement: Allocating Resources

- Fewer Than 10% of Strategies are Implemented Successfully (Misallocation)
- Top Responsibility of Strategic Management
- Four Types of Resources:
  - financial, physical, HR, and IT
- Must Be Consistent with Strategic Goals
  - budget reflects true values

Evaluate: The Process

- Back to Square One (Success, Not Failure)
- Revise External and Internal Analyses
- Compare Revisions and Results to Original Expectations and Assumptions
  - identify differences and understand reasons for them
- Important Differences Indicate Need for Change
- Small Changes Add Up Over Time
  - small changes always occur
  - dangerous to ignore
Some Strategic Implications

- Prepare to Adapt and Change
  - in other words, research, develop, innovate
- There Will be Failure; Risk Taking Required
  - small scale failure (no catastrophes)
  - fail quickly, learn, move on
  - risk management more important than ever
- Innovation Creates Value
  - share risks and benefits with others in supply chain

More Strategic Implications

- For Business and Industry
- Manage to Stabilize Margins
  - focus on managing costs as well as revenue
  - no perfect hedge; basis risk remains
- Use Crop Insurance When Needed
- Take Advantage of Historically Low Rates
  - lock in rates or refinance
- Optimize Leverage
  - pay down debt (or restructure) if overleveraged
  - don’t overextend financial situation
Evaluate: Expect the Unexpected

- Significant Change Can Happen Quickly
  - low probability but huge impact
  - little time to react
  - planning helps prepare
  - plan for the best and plan for the worst
- Have Contingency Plan
  - Plan B scenario
  - Worst Case scenario
  - Exit Strategy (how do I get out of this?)
- Know What to Do When Things Go Wrong

Evaluate: Adapt or Perish

- Strategic Process is Never Ending
- New Information Drives Process
  - operations generate new information
    - fed into external and internal analysis
  - new objectives and strategies result
  - can change nature of business and company
- External and Internal Environments Change
  - competitors react to your strategies; you react to theirs
- Failure to Evaluate Kills Many Strategic Efforts
- Is It Working? Failing? Can We Do Better?
Farming looks mighty easy when your plow is a pencil and you're a thousand miles from the corn field.

–Dwight David Eisenhower

Contact Information

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