ASSESSING THE ECONOMIC BENEFITS OF COOPERATION AMONG SMALL FOREST OPERATORS: A SASKATCHEWAN CASE STUDY

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THE INDEPENDENT FOREST OPERATORS

- Small to medium sized processing mills located throughout the central/north central region of Saskatchewan.
- Produce fence posts, rails, lumber, railway ties, buildings logs, etc.
- Hold small volume based Forest Product Permits (~500-20,000 m^3) valid throughout large Geographical Areas (FMAs).
- Most small operators harvest their own timber allocations, while those with allocations greater than 10,000m^3 typically hire contract loggers.

PROBLEMS FACING INDEPENDENT OPERATORS

- Downturn in Forest Products Economy

  - Increasing costs, low demand, increasing competitiveness, and low prices.

- Lack of Economies of Scale

  - Small size and lack of larger scale organization.

- Low Tenure and Access to Fibre

  - Weak tenure arrangements and an inability to access more fibre in current tenure system.

- Poor Fibre Utilization

  - High fibre specificity in production processes and lack of residual markets.

PURPOSE

- To examine the potential benefits provided to IOs by the cooperative model.
- To determine if application of the model has the ability to increase competitiveness of IOs.
- To quantify the economic benefits provided to IOs and the industry.
- To determine if economies of scale and scope are present in fibre procurement costs and fibre utilization.

METHODS

- 1. Literature Review

  - Classic literature review methodology focused on literature pertaining to forestry and agricultural cooperatives.

- 2. Background Research

  - Interviews with the executive director and president of the Independent Forest Operators of Saskatchewan.

- 3. Cooperative Model Selection

  - The NGC framework was chosen as the cooperative model that the business as usual case would be compared to.

METHODS

- 5. Economic Cost Model Development

  - Business as Usual (Factual) and IO NGC (Counter-factual) economic cost models were developed using information obtained in earlier stages.

- 6. Comparative Economic Analysis

  - Utilized to analyze the IO NGC's effect on fibre procurement costs and the presence of economies of scope.

IO NEW GENERATION COOPERATIVE

- IOs would enter into NGC with three share classes: equity, delivery and investment.
- The IO NGC would conduct all licencing and harvesting activities.
- An IO log sort yard would be established in a central location near transport. infrastructure.
- The sort yard would provide IOs with the specific fibre types required for production.

BUSINESS AS USUAL COST MODEL

$$TC_{BAU} = C_I + C_D + C_L + C_X + C_R + C_{H(BAU)} + C_{S(BAU)} + C_{A(BAU)}$$

where total cost is a function of,

C_I = forest inventory,

C_D = crown dues and reforestation fees

C_L = transportation licencing

C_X = highway taxes

C_R = roads and reclamation costs

$C_{H(BAU)}$ = harvesting and hauling

$C_{S(BAU)}$ = scaling

$C_{A(BAU)}$ = administrative costs

IO NGC COST MODEL

$$TC_{NGC} = C_I + C_D + C_L + C_X + C_R + C_{H(NGC)} + C_{S(NGC)} + C_{A(NGC)} + C_{Y(NGC)} + C_{M(NGC)}$$

where total cost is a function of,

C_I = forest inventory,

C_D = crown dues and reforestation fees

C_L = transportation licencing

C_X = highway taxes

C_R = roads and reclamation costs

$C_{H(NGC)}$ = harvesting and hauling (based on tree-length costs only)

$C_{S(NGC)}$ = scaling

$C_{A(NGC)}$ = administrative costs

$C_{Y(NGC)}$ = log sort yard costs

$C_{M(NGC)}$ = delivery costs

BAU AND NGC MODEL DIFFERENCES

Table 1: Differences between the BAU and NGC models		
	BAU	NGC
Harvesting	- Harvesting of both cut-to-length and tree-length fibre	- Harvesting of only tree-length fibre
Scaling	- Scaling consultant fee (in $/m3),	- Sample scaling frequency - Annual capital cost of weigh scale equipment - Productivity - Labour
Administration	N/A	- Added annual general and administrative expenses
Log sort yard	N/A	- Annual capital cost of log sort yard (including land and buildings), - Annual loader capital - Repair and maintenance - Fuel - Labour
Delivery/ Hauling	N/A	Delivery from log sort yard to IOs

ASSUMPTIONS

- Fibre volume demanded is low and competition is weak.
- IOs face the same fibre procurement costs.
- 20% of IOs join co-op in years 1 through 5 and by year 5 100% of IOs are participating.
- IO NGC fibre utilization reaches 100%.
- IO NGC fibre prices are equalized for all members.

BUSINESS AS USUAL MODEL RESULTS

- Low fibre utilization (71%).
- Harvesting costs make up 74% of gross fibre procurement costs.
- Forest inventory & licensing costs contribute the least to gross fibre procurement cost.
- Gross fibre procurement costs were \$58/m^3 and effective fibre procurement costs were \$81/m^3
- EFPC = GFPC/U

IO NGC MODEL RESULTS

- High fibre utilization (100%).
- Harvesting cost still the greatest contributor to gross fibre procurement cost (57%).
- Co-op admin, sort yard, sort yard to mill shipping were the next greatest contributors.
- Gross/effective fibre procurement costs determined to be \$ 67.36/m^3 in year one (17% lower than in BAU case).

COMPARATIVE ANALYSIS RESULTS

- Gross costs increased in all years except for year 5 when harvest levels exceeded 200,000 m^3.
- Effective costs decreased in all years at all harvest levels.
- Co-op admin, sort yard, sort yard to mill shipping, and harvesting costs were the largest contributors to changes in gross costs.

SENSITIVITY AND BREAKEVEN ANALYSIS

- Changes in harvesting costs and utilization rates have the greatest effect on changes to the effective cost in both models.
- The utilization rate has a 0.99:1 effect and thus poses the greatest degree of risk.
- At 90% utilization, reductions in effective cost, though limited, are present at all harvest levels.
- The breakeven utilization rate varies from 84% to 71% depending on harvest level.

SENSITIVITY AND BREAKEVEN ANALYSIS

- At full utilization, the effective cost of fibre procurement varies from 12% to 30% depending on the participation rate.
- At 90% utilization, the effective cost of fibre procurement varies from 8% to 22%.

CONCLUSIONS

- The NGC model generates significant fibre cost reductions through increased utilization and lower fibre procurement costs created by economies of scope.
- Fibre utilization is likely the largest challenge facing IOs. NGC model solves this by reducing fibre specificity.
- Policies aimed at reducing taxes, surcharges, and royalties will have little effect.

CONCLUSIONS

- Mills that utilize residual fibre are important to overall health of industry. Policy should be focused here.
- The model is most successful if high fibre specificity or low fibre grades are present.
- Future research topics in this realm could focus on quantifying transaction cost reductions and examining the environmental benefits generated by utilization increases.

END OF PRESENTATION

- Questions?