EASTERN AUTO STORES CONTRACT ANALYSIS

Computing the overall financial and scheduling impact on Rubicon Rubber

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Executive Summary

Introduction

The future growth of the company is closely linked to the development and sale of specialty tractors and forklift trucks, and the exploration of auxiliary production lines such as car tires. With Eastern Auto Stores contract, Rubicon decided to branch in car tires to supplement machine downtime from outstanding contracts. While these began as supplementary business endeavors, growth in demand over the previous two years indicates that tire contracts have the potential to be a dependable income source.

Overview

The contract with Eastern Auto Stores specifies the delivery of snow tires to Eastern Auto Stores during the months of June, July, and August, when Rubicon generally has extra downtime with their machines. While there were concerns that Rubicon did not have the capacity to complete the excess work, those worries are unfounded. Rubicon has the ability to meet, and exceed, the demand of the contract.

Summary of Results

Working with the constraints of Rubicon's production schedule, we developed a model that considers demand, storage costs, machine availability, and runtime costs to find the optimal production plan to meet Eastern's needs. The model predicts that:

1. Rubicon is able to meet the demand
2. Rubicon will generate both positive net income, gross profit, and cash flow
3. Rubicon should not expedite the delivery of the new machine

In addition, the company has the ability and resources to make more fiberglass tires by utilizing its remaining machine hours. The expedited arrival of a new wheeling machine in August would not be necessary as long as the increased demand is still bound by the company's constraints. Eastern Auto Stores has indicated they might be interested in more fiberglass tries than previously specified. Rubicon can likely meet the increased demand, but must consider that there might not be enough hours over the summer to conduct maintenance. If the contract is unaltered, there will be enough hours to send a few employees on vacation, however not everyone will receive time off over the summer.

After accounting for all of the constraints and desires of the two parties, it is our recommendation that Rubicon Rubber accept Eastern Auto Stores prospective contract.

From a purely financial a perspective, Rubicon Rubber Company should sign the contract with Eastern Auto Stores. The deal will create both positive net income and cash flow as both an isolated contract and as a part of the greater company finances. In the final negotiations, several issues to consider and discuss are early delivery of tires demanded and if the tires can be delivered on a more regular basis in contrast to a single delivery at the end of each month. This report makes the following assumptions: every tire must either be stored or shipped directly to Eastern; all materials are purchased one month prior to their use; payment is received upon delivery; supervisors and office staff are salaried positions; the machine costs are financed in a one-time payment; operating hours are not transferable between months; vacation time is unpaid; a workweek is 40 hours; there are greater than 15 employees at the company; the cost to hire a temporary employee is less than the breakdown of a full-time worker's salary per hour; and every tire produced must be stored before distribution. These assumptions, not indicated in the constraints have allowed us to reach the conclusion that the project will generate a gross profit of $84,040.48 and $54,626.31 in net income for Rubicon (Figure 7).

The revenue created from this project will be substantial. It is estimated that Rubicon will receive $204,000.00 from the contract with Eastern. This has the potential to be inflated if the price for either tire can increase. A price increase will generate a proportional rise in the total revenue and profits in addition to greater margins. The margin of each tire is directly dependent on the costs associated with manufacturing and delivery to the customer. Currently, as illustrated by Figure 1, materials for each tire are the most expensive aspect of production, comprising 66% of total costs. Following materials, the cost of machine time is the largest cost

(27%) for this contract. However, after removing salaried positions and the sunk costs of the machines (removing depreciation), this component shrinks to only 18%, while materials costs increase to 74% as seen in Figure 2. The decrease in overhead costs directly increased gross margins by almost 7% (Figure 3).

The change in margins, and therefore gross profit can be achieved by removing the fixed costs associated with the management and operation of Rubicon. The Eastern contract is beneficial to the company regardless of the consideration of these fixed costs, however the benefit of removing fixed costs illustrates the impact of the Eastern Contract on the overall company. Costs such as supervisors are salaried; therefore, there is not a cost associated with them working more hours. The increased margins, and net income are illustrated in Figure 3. In addition, the gross profit of the Eastern contract (in isolation) is only $68,501.89, in comparison to the Rubicon's total gross profit of $84,040.48. After accounting for taxes, the contract generates a net income of $44,526.23; however, Rubicon actually realizes a net income of $54,626.31, after removing fixed costs. The total cash flow generated from the contract is $70,882.22, after the materials costs, supervisor and office salaries, and depreciation of the machines were accounted (Figure 4). As evidenced by the positive cash flow and net income on both the contract and company basis, the contract with Eastern Auto Stores will be beneficial to Rubicon Rubber Company; however, the analysis has identified several areas in which the gross profits could be increased.

There is potential in this contract to generate slightly more gross profit by negotiating a different delivery schedule and renegotiating materials contracts with suppliers. If Eastern is

willing to accept deliveries throughout the month, and the change in shipping costs is less than $0.10 per tire, then Rubicon should ship batches of tires directly to Eastern from the production line, reducing storage costs. The only tires that will need to be stored are the tires produced in one month to be sold in the next. Rubicon should ask Eastern if they can ship the excess tires early and wait to invoice for the excess tires until the contract specifies the need. For example, if a tire is produced in June, but is not required by Eastern till July, Rubicon should attempt to send the tire in June and wait to invoice Eastern for the tire until July. This would effectively eliminate storage costs and increase gross profit proportionally.

Another avenue of potential savings is material costs. Rubicon has seen the success of the tire production line for the previous two years. If they intend to continue to produce tires as an auxiliary income stream and diversification strategy, a decrease in material costs could be obtained by negotiating with the supplier to decrease prices for a larger order size. The minimization of materials costs is the easiest way to increase the gross profit as materials comprise the largest portion of the costs associated with tire production. While the Eastern contract is currently profitable for Rubicon, increased margins allow for cash flow to be diverted to other business endeavors. Although, renegotiating supply contracts for an auxiliary production line will likely require more effort than speaking to Eastern, the realized gains will dwarf the money saved by minimizing storage as it is the largest component of price. The full profit and loss tables are illustrated in Figure 7.

Production:

Rubicon has the ability to produce the demand of fiberglass and nylon given by the Eastern Auto Stores contract without any overproduction or waste of materials. The production and storage for each month can be seen in Figure 6. By producing more than the demand in June, for both nylon and fiberglass tires, Rubicon is able to store tires to be used the following month to meet the demand in July while still meeting the company's production constraints. It might be possible to negotiate a decrease in storage costs for the month of June due to the economies of scale (Rubicon is storing more tires). This means that the company will not produce any tires that will not be ultimately profitable for the company. If the demand for tires in July were to increase, Rubicon would not be able to make any more tires in the month of July, but there would be left over materials and labor hours in June to meet July demands up to an additional 1,987 tires. Since more tires cannot be produced in July, a higher demand in August would either have to be accommodated for by increasing production in June and storing them until August, or increasing the production in August up to 1,761 tires. If tire demands increase about these upper limits, then Rubicon would not be able to supply unless the extra Wheeling Machine was expedited to arrive August. While there is capacity to fulfil extra fiberglass tire demand, there is an opportunity cost of not scheduling maintenance over the summer months. Rubicon must consider this cost before accepting an increased order from Eastern.

Machine Operations

Rubicon rubber does have the capacity to complete the Eastern Auto Stores contract. Although not all of the hours available are used, vacation will need to be limited during the summer as there are only a few excess hours each month. To optimize production, the machine scheduling should be set as seen in Figure 5, resulting in the Wheeling machine being scheduled for a total of 1999.5 hours and the Regal machine accumulating 1675.2 hours of use.

Due to the excess hours available throughout the summer, including August, Rubicon should not expedite delivery of the new Wheeling Machine. The early addition of a new machine would only cost the company $200; however, even including the cost of expediting the machine, gross profits and cash flow will remain positive. This indicates that if Rubicon needs the machine for other production, then the Eastern contract can absorb the change in costs without largely affecting any finances. However, if Eastern increases their demand for fiberglass tires to greater than and additional 3,748, the new wheeling machine should be purchased in order to meet the new demand. A potential increase in demand will likely affect the cost of materials as well as shipping costs; both have the potential to decrease as a result of the economies of scale. The decrease in costs will alter the gross margins and net income from this Contract.

However, if Eastern does not demand more fiberglass tires, then Rubicon can use the excess hours to give their workers vacation. Leftover hours as seen in Figure 5 indicate the unused machine hours that can be transferred to workers' vacation. It seems most optimal to give vacation time in June and August where there is the most available time. For example, there

are 276.64 unused hours in the month of June, which means that 6 employees would have the opportunity to take one week's vacation. Giving employees vacation in July could result in short staffing and the inability to meet the demand for that month since maximum time is needed on both machines. Since not everyone would be able to take vacation over the three months of the summer, some vacation days would have to be made up later in the year or around Christmas time. The hiring of part-time summer employees could give the full-time labor force time for vacation as well. However, if the salaried employees are taking unpaid vacation time, then it would be more of a cost burden on Rubicon to hire temporary employees. If the demand of tires is increased for the month of August, and the wheeling machine delivery is expedited, then hiring temporary employees may be beneficial in order to meet the demand. If vacation time is offered to employees, that will allow Rubicon to use the excess machine time for maintenance. Maintenance can be scheduled for a maximum number of extra hours in each month as detailed by Figure 5. The Wheeling machine is unable to be maintained over the summer, if the Eastern contract is accepted. If the opportunity cost of maintenance after August is greater than $200, then Rubicon should expedite delivery on the new machine to meet Eastern's demand and maintain the old machine during the month of August. The maximal number of consecutive maintenance days for the Regal is machine is 11 calendar days in June.

After thorough examination of the Eastern contract, there are many profitable options for Rubicon. Although there are many possibilities, it is ultimately up to Rubicon to decide what is most optimal for the company, given preferences and the data presented.

Appendix

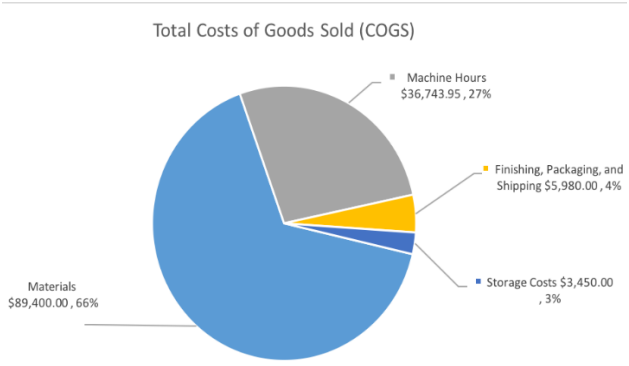

Figure 1 Cost of Goods Sold – Eastern Contract

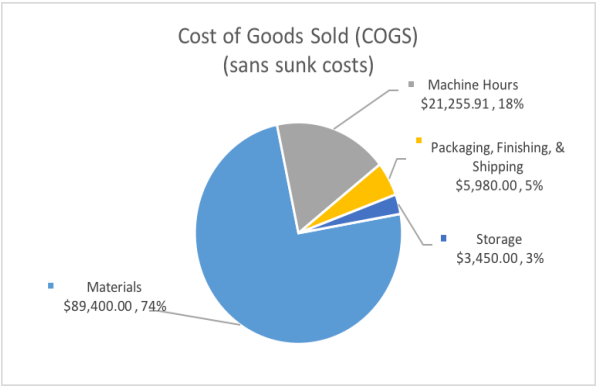

Figure 2 Total Cost of Goods Sold (COGS) – sans sunk cost

Eastern Contract Vs. Overall Company Impact

Impact	Revenue	Total COGS	Gross Profit	Gross Margin	Overhead Allocation	EBIT	Taxes @ 35% + state	Net Income
Eastern	$ 204,000.00	$ 135,573.95	$ 68,426.05	34%	N/A	N/A	$ (23,949.12)	$ 44,476.94
Total*	$ 204,000.00	$ 120,085.91	$ 83,914.09	41%	N/A	N/A	$ (29,369.93)	$ 54,544.16

Figure 3 Eastern Contract vs. Rubicon Company Impact

*Total excludes fixed costs (depreciation and salaried employees)

Incremental Cash Flow

	May		June		July		August	
Incremental Cash Flow	Regal	Wheeling	Regal	Wheeling	Regal	Wheeling	Regal	Wheeling
Net Income	-	-	$ 9,976.43	$ 13,451.21	$ 2,908.75	$ 2,674.35	$ 436.37	$ 15,079.11
Materials Payable	$ (23,671.60)	$ (22,737.00)	$ 15,921.60	$ 16,295.60	$ 6,714.60	$ (21,323.20)	$ 1,035.40	$ 27,764.60
Depreciation		-	$ 4,581.60	$ 2,917.33	$ 1,500.00	$ 1,251.00	$ 200.40	$ 4,169.58
Supervisor Salary		-	$ 305.44	$ 174.90	$ 100.00	$ 75.00	$ 13.36	$ 249.98
Office Expenses		-	$ 2,443.52	$ 1,399.20	$ 800.00	$ 4,068.00	$ 106.88	$ 1,999.80
Cash Flow	$ (23,671.60)	$ (22,737.00)	$ 33,228.59	$ 34,238.24	$ 12,023.35	$ (13,254.85)	$ 1,792.41	$ 49,263.07
Monthly Totals	$ (46,408.60)		$ 67,466.84		$ (1,231.50)		$ 51,055.48	
				Total Cash Flow	$ 70,882.22			

Figure 4 Incremental Cash Flow

Machine Scheduling Hours

	June		July		August	
	Wheeling	Regal	Wheeling	Regal	Wheeling	Regal
Hours Used	699.60	1,221.76	300.00	400.00	999.90	53.44
Excess Hours	0.40	278.24	-	-	0.10	246.56
Total Avalible	700	1500	300	400	1000	300

Figure 5 - Machine Scheduling

Production and Storage Rates

	June		July		August	
	Nylon	FG	Nylon	FG	Nylon	FG
Production	7636	5830	4364	170	3000	5000
Demand	4000	1000	8000	5000	3000	5000
Excess	3636	4830	-3636	-4830	0	0
Storage	7636	11660	8000	5000	3000	5000

Figure 6 - Production and Storage

Profit and Loss – Eastern Contract Vs. Overall Company

	June				July				August				TOTALS
	Fiber Glass - Regal	Fiber Glass Wheeling	Nylon - Regal	Nylon - Wheeling	Fiber Glass - Regal	Fiber Glass Wheeling	Nylon - Regal	Nylon - Wheeling	Fiber Glass - Regal	Fiber Glass Wheeling	Nylon - Regal	Nylon - Wheeling	
Number of Units	-	5,830.00	7,636.00	-	-	170.00	2,500.00	1,864.00	-	5,000.00	334.00	2,666.00	
Price per Unit ($)	$ 9.00	$ 9.00	$ 7.00	$ 7.00	$ 9.00	$ 9.00	$ 7.00	$ 7.00	$ 9.00	$ 9.00	$ 7.00	$ 7.00	
Revenue	$ -	$ 52,470.00	$ 53,452.00	$ -	$ -	$ 1,530.00	$ 17,500.00	$ 13,048.00	$ -	$ 45,000.00	$ 2,338.00	$ 18,662.00	$ 204,000.00
Cost of Goods Sold (COGS)													
Material	$ -	$ 22,737.00	$ 23,671.60	$ -	$ -	$ 663.00	$ 7,750.00	$ 5,778.40	$ -	$ 19,500.00	$ 1,035.40	$ 8,264.60	$ 89,400.00
Total Hours	-	699.60	1,221.76	-	-	20.40	400.00	279.60	-	600.00	53.44	399.90	
$/hour	9.75	10.17	9.75	10.17	9.75	10.17	9.75	10.17	9.75	10.17	9.75	10.17	$ 36,668.12
Packing, finishing, shipping	-	1,340.90	1,756.28	-	-	39.10	575.00	428.72	-	1,150.00	76.82	613.18	$ 5,980.00
Storage	-	583.0	763.6	-	-	317.0	800.0	186.4	-	500.0	33.4	266.6	$ 3,450.00
Total COGS	-	31,775.83	38,103.64	-	-	1,226.57	13,025.00	9,237.05	-	27,252.00	1,666.66	13,211.36	$ 135,498.12
Gross Profit	$ -	$ 20,694.17	$ 15,348.36	$ -	$ -	$ 303.43	$ 4,475.00	$ 3,810.95	$ -	$ 17,748.00	$ 671.34	$ 5,450.64	**$ 68,501.89**
Gross Margin	0%	39%	29%	#DIV/0!	0%	20%	26%	0%	0%	39%	29%	29%	**34%**
Overhead Allocation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
EBIT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Taxes @ 35% + state	$ -	$ (7,242.96)	$ (5,371.93)	$ -	$ -	$ (106.20)	$ (1,566.25)	$ (1,333.83)	$ -	$ (6,211.80)	$ (234.97)	$ (1,907.72)	$ (23,975.66)
Net Income	$ -	$ 13,451.21	$ 9,976.43	$ -	$ -	$ 197.23	$ 2,908.75	$ 2,477.12	$ -	$ 11,536.20	$ 436.37	$ 3,542.91	**$ 44,526.23**
Total Net Income per Month			$ 23,427.64				$ 5,583.10				$ 15,515.49		

Eastern Contract Only

	June				July				August				TOTALS
	Fiber Glass - Regal	Fiber Glass Wheeling	Nylon - Regal	Nylon - Wheeling	Fiber Glass - Regal	Fiber Glass Wheeling	Nylon - Regal	Nylon - Wheeling	Fiber Glass - Regal	Fiber Glass Wheeling	Nylon - Regal	Nylon - Wheeling	
Number of Units	-	5,830.00	7,636.00	-	-	170.00	2,500.00	1,864.00	-	5,000.00	334.00	2,666.00	
Price per Unit ($)	$ 9.00	$ 9.00	$ 7.00	$ 7.00	$ 9.00	$ 9.00	$ 7.00	$ 7.00	$ 9.00	$ 9.00	$ 7.00	$ 7.00	
Revenue	$ -	$ 52,470.00	$ 53,452.00	$ -	$ -	$ 1,530.00	$ 17,500.00	$ 13,048.00	$ -	$ 45,000.00	$ 2,338.00	$ 18,662.00	$ 204,000.00
Cost of Goods Sold (COGS)													
Material	$ -	$ 22,737.00	$ 23,671.60	$ -	$ -	$ 663.00	$ 7,750.00	$ 5,778.40	$ -	$ 19,500.00	$ 1,035.40	$ 8,264.60	$ 89,400.00
Total Hours	-	699.60	1,221.76	-	-	20.40	400.00	279.60	-	600.00	53.44	399.90	
$/hour	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	$ 21,129.53
Packing, finishing, shipping	-	1,340.90	1,756.28	-	-	39.10	575.00	428.72	-	1,150.00	76.82	613.18	$ 5,980.00
Storage	-	583.0	763.6	-	-	317.0	800.0	186.4	-	500.0	33.4	266.6	$ 3,450.00
Total COGS	-	28,683.60	33,216.60	-	-	1,136.40	11,425.00	8,001.22	-	24,600.00	1,452.90	11,443.81	$ 119,959.53
Gross Profit	$ -	$ 23,786.40	$ 20,235.40	$ -	$ -	$ 393.60	$ 6,075.00	$ 5,046.78	$ -	$ 20,400.00	$ 885.10	$ 7,218.20	$ - **$ 84,040.48**
Gross Margin	0%	45%	38%	0%	0%	26%	35%	0%	0%	45%	38%	39%	**41%**
Overhead Allocation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
EBIT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Taxes @ 35% + state	$ -	$ (8,325.24)	$ (7,082.39)	$ -	$ -	$ (137.76)	$ (2,126.25)	$ (1,766.37)	$ -	$ (7,140.00)	$ (309.79)	$ (2,526.37)	$ (29,414.17)
Net Income	$ -	$ 15,461.16	$ 13,153.01	$ -	$ -	$ 255.84	$ 3,948.75	$ 3,280.41	$ -	$ 13,260.00	$ 575.32	$ 4,691.83	**$ 54,626.31**
Total Net Income per Month			$ 28,614.17				$ 7,485.00				$ 18,527.14		

Rubicon Total Company Impact

Figure 7 - Profit and Loss

Rubicon’s Decision Model

	Profit	Machine	Materials	Packing/Shipping	Storage	Rev	margin %
Nylon Tire Price - Wheeling	$ 2.04	$ (1.53)	$ (3.10)	$ (0.23)	$ (0.10)	7	29%
Nylon Tire Price - Regal	$ 2.01	$ (1.56)	$ (3.10)	$ (0.23)	$ (0.10)	7	29%
Fiber Glass Tire - Wheeling	$ 3.55	$ (1.22)	$ (3.90)	$ (0.23)	$ (0.10)	9	39%
Fiber Glass Tire - Regal	$ 3.41	$ (1.37)	$ (3.90)	$ (0.23)	$ (0.10)	9	38%

	Nylon						Fiber Glass Tires																								
Constraint Lables	Nylon Regal June	Nylon Regal July	Nylon Regal August	Nylon Wheeling June	Nylon Wheeling July	Nylon Wheeling August	FG Regal June	FG Regal July	FG Regal August	FG Wheeling June	FG Wheeling July	FG Wheeling August	Nylon June	Nylon July	Nylon August	FG June	FG July	FG August	Storage June Nylon	Storage June FG	Storage July Nylon	Storage July FG	Storage August Nylon	Storage August FG	EX. Nylon June	Ex. FG June	Ex. Nylon July	Ex. FG July	LHS	Relation	RHS
	7636	2500	334	0	1864	2666	0	0	0	5830	170	5000	7636	4364	3000	5830	170	5000	7636	5830	8000	5000	3000	5000	3636	4830	0	0			
Obj Func	$ 2.01	$ 2.01	$ 2.01	$ 2.04	$ 2.04	$ 2.04	$ 3.41	$ 3.41	$ 3.41	$ 3.55	$ 3.55	$ 3.55	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (0.10)	$ (0.10)	$ (0.10)	$ (0.10)	$ 68,507.33		
Wheeling Machine - June (hr)				0.15						0.12																			699.75	<=	700
Regal Machine - June (hr)	0.16						0.14																						1221.76	<=	1500
Wheeling Machine - July (hr)					0.15						0.12																		300.00	<=	300
Regal Machine - July (hr)		0.16						0.14																					400.00	<=	400
Wheeling Machine - August (hr)						0.15						0.12																	999.90	<=	1000
Regal Machine - August (hr)			0.16						0.14																				53.44	<=	300
Demand Nylon - August			1			1																					1		3000.00	=	3000
Demand Fiberglass - August									1			1																1	5000.00	=	5000
Storage Nylon June	1			1															-1										1.00	=	0
Storage FG June							1			1										-1									0.00	=	0
Total Demand Nylon	1	1	1	1	1	1																							15001.00	=	15000
Total Denamd Fiber Glass							1	1	1	1	1	1																	11000.00	=	11000
Nylon June	1			1									-1																1.00	=	0
Nylon July		1			1									-1															0.00	=	0
Nylon August			1			1									-1														0.00	=	0
FG June							1			1						-1													0.00	=	0
FG July								1			1						-1												0.00	=	0
FG August									1			1						-1											0.00	=	0
Storage Nylon August			1			1																	-1				1		0.00	=	0
Storage FG August									1			1												-1				1	0.00	=	0
Demand Nylon - June	1			1																					-1				4001.00	=	4000
Demand Fiberglass - June							1			1																-1			1000.00	=	1000
Demand Nylon - July		1			1																				1		-1		8000.00	=	8000
Demand Fiberglass - July								1			1															1		-1	5000.00	=	5000
Storage Nylon July		1			1																-1				1				0.00	=	0
Storage FG July								1			1											-1				1			0.00	=	0

Figure 8 - Decision Model