FEATURE ARTICLE

THROUGHPUT ACCOUNTING

THE IMPORTANCE OF MEASURING BOTH NET PROFIT AND RETURN ON INVESTMENT

BY STEVEN BICK

Accountant—*"someone who solves a problem you didn't know you had in a way you don't understand"*

Throughput Accounting—*"a simple method of making financial measurements a business can use in making decisions"*

Financial measurements are essential to the continuous improvement of a logging business. Logging is difficult to compare to a brick and mortar business, with fixed production facilities or a storefront, but traditional accounting rules treat it that way. Monthly or quarterly profit and loss statements can be useful, but they really don't tell a logger much about the types of harvesting jobs that are profitable. With this in mind, financial measurements should be made for each individual harvesting job. In this way, these measurements serve as a guide for operational decision making.

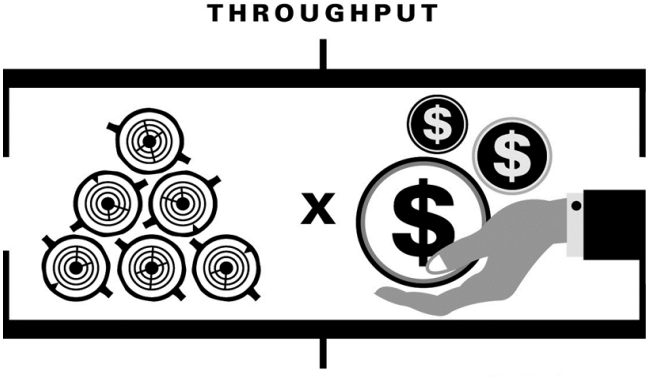
Throughput accounting was first advanced by Eliyahu Goldratt, an Israeli physicist who pioneered a new school of thought in production and project management.. He created a revolutionary, continuous improvement approach to production which suggests modest but powerful financial measurements. These measurements are *net profit* and *return on investment (ROI)*. In order to make these financial measurements some accounting is necessary. Accounting measures include *throughput*, *operational expense* and *investment*.

Throughput is the rate at which a business generates net revenue. It's a simple matter of multiplying the amount of each product produced (sawlogs, pulpwood, chips, etc.) by the appropriate net price (removing stumpage and or trucking costs) and then adding all of the totals together.

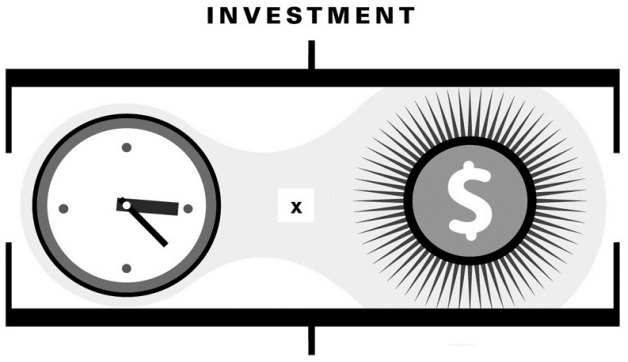
Operational expense is the amount spent to harvest the timber. This includes the costs of owning and operating equipment, overhead, and any job specific costs (e.g. moving, gravel, seeding, etc.). This accounting can be tedious, but fortunately (at least from an accounting standpoint!), most of the information is already summarized annually on an income tax return (Form 1040, Schedule C, in most cases). This information can used to determine the average daily costs for overhead. Overhead can be thought of as fixed business costs not directly related to individual jobs.

Investment is the most difficult of these measures to grasp. A logging business is largely an investment in equipment. These machines just enable production and they certainly don't appreciate in value. The investment is consumed during production through a process known as depreciation. The proceeds from logging cover operational expenses first, recover the investment next and provide a profit last. It follows that a logger's investment in an individual timber harvesting job is the depreciation that occurs there. The most convenient way to measure this is hourly, multiplying the cumulative number of hours for each machine by the appropriate depreciation rate.

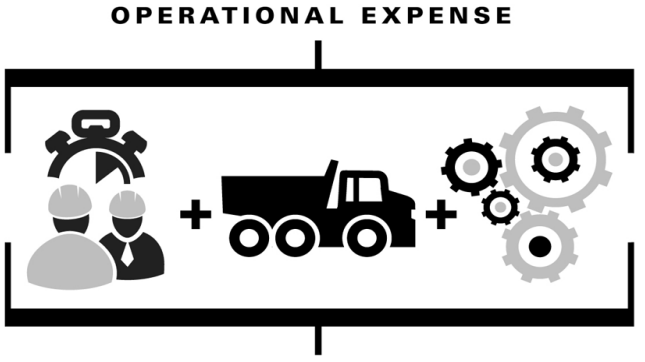
Profit is simply revenue minus expenses. *ROI* is the rate of profit in relation to the investment needed to produce it. Loggers are reluctant to share their target return on investment rates, so it is difficult to identify benchmarks for comparison. An individual business can compare the ROI from one harvesting job to the next. While a logger might not be in a position to



Production [Tons, MBF, Cords] x Net Prices



Sum of hourly equipment depreciation for individual job



Overhead + Job Specific Costs + Equipment Costs

target only the most profitable jobs, knowing how they compare to one another will help in avoiding the least profitable ones.

Make financial projections before beginning individual jobs. Good record keeping (especially of machine hours), allows accurate calculation of profit and ROI after a job is complete.

Here is an example analysis of a harvesting job that was completed over 25 days by a cut-to-length system (harvester & forwarder), using throughput accounting:

Operational Expense

	days	$ per day		cost
daily overhead	25	$ 250	$	6,250
job specific costs (moving, seeding)			$	800

	hours	$ per hour		
CTL Harvester	175	$ 125	$	21,875
Forwarder	150	$104	$	15,600
Total Cost			**$**	**44,525**

Throughput

	volume			price*		revenue
sawlogs	156	MBF	$	120	$	18,720
pulpwood	1,200	tons	$	22	$	26,400
Total Throughput					**$**	**45,120**

*price on landing, no trucking involved

Investment

	hours	$ per hour*		investment
CTL Harvester	175	$ 45	$	7,875
Forwarder	150	$ 35	$	5,250
Total Investment			**$**	**13,125**

*actual hourly depreciation

Profit = Throughput - Operational Expense = $45,120 - $44,525 = **$595**

Return on Investment = Profit / Investment = $595 / $13,125 = **4.5%**

In this example, the business recorded a $595 profit (over and above the expense of a reasonable wage for the owner/operator) for this harvesting job, representing a 4.5 percent return on its investment. This is a narrow margin—so much so that dropping the price of pulpwood by $1 per ton results in a net loss for the job!

Using these financial measurements for each harvesting job allows a logger to make objective comparisons among them. While additional factors (weather, relationships, prospect of future work) often go into job selection, throughput accounting can bolster these choices with cold hard facts.

A logging business is basically an investment in equipment.

The concepts behind these financial measurements are not difficult, but actually measuring them for a logging business can be. The busy life of a logger, when coupled with a positive cash flow, can make critical measurements easy to overlook. PATH (Planning & Analysis in Timber Harvesting) is a free spreadsheet utility that was recently updated to include throughput accounting measures for loggers. Download a copy at *www.northeastforests.com* or by scanning the RQ code to the right.

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