

Spreadsheet clears up confusion on buying decisions

Help control business costs by using discounted cash-flow analysis when deciding whether to replace or repair equipment

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Discounted cash-flow analysis is a technique that helps determine whether it's economically sound to replace a piece of equipment or to repair it. It's based on the time value of money, meaning a dollar in hand today is worth more than one in the future.

To be economically sound, a capital purchase should result in a positive net present value. Over the period of time the purchase will be used, inflows from the decision should exceed the outflows because of the decision. Net present value accounts for the effects of income taxes, inflation, interest rates, and the timing and size of the inflows and outflows.

An Excel spreadsheet **EQUPUR902** (page 22) can perform the calculations necessary to determine net present value and help answer the replacement question. To use the spreadsheet, you must supply data on:

- The new machine purchase.
- The costs of continuing to operate the existing machine.

You'll also have to make assumptions about equipment in your specific situation.

How EQUPUR902 works

Mary Brown owns a skidsteer that requires a major overhaul, costing roughly \$5,000. Should Mary replace the skidsteer with a new one or repair her old one?

She inputs her best estimates into the **EQUPUR902** spreadsheet, and it performs an economic analysis. The results let Mary see the present value of costs associated with the new machine compared to the present



When deciding whether or not to replace equipment such as a skidsteer, compute if it results in a positive net present value. Also factor in timeliness.

value of the savings from not fixing the old skidsteer. (Table 1)

Machine to be Evaluated: Skidsteer

Loan amount	\$20,000
Interest rate	9.25%
Term, yrs.	4
Weighted ave. cost of capital	7%
Marginal income tax rate	30%
Inflation rate	3%
Section 179 Election	\$10,000
Price less trade-in	\$20,000
Avoided repairs, old skidsteer	\$5,000
Reduced repairs, new skidsteer	\$1,000
Annual fuel savings, new skidsteer	\$200
Inc. in value of new vs. old skidsteer,	
5 years from now	\$5,000

The bottom line

If the net present value is positive, the decision is economically sound. But the analysis shows the net present value for the skidsteer is a negative \$3,515. Now Mary knows that it's cheaper to fix her old skidsteer than replace it with a new one.

FYI

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■ Find the **EQUPUR902** spreadsheet at Agricultural and Small Business Finance website: http://agfinance.aem.cornell.edu/decision_aids.htm. Look for both Equipment Repair and Replace and Analyzing Replacement Equipment Purchases Guide.

But there's one more thing for her to consider. Mary didn't enter a value for improved timeliness resulting from the new machine.

A number for timeliness is difficult to estimate, but it needs to be considered. Does a

new skidsteer over the next five years provide enough other benefits to offset the \$3,515 in net present value? If so, then the decision would be to purchase the new skidsteer vs. fix the old one. ■

Item	Amount before tax	Amount after tax	Timing year Start	Timing year End	Present value factor	Present value
OUTFLOWS						
Eqpt price less trade-in value	20,000					
Unrecovered cost on trade-in	0					
Down payment at time of sale	0			0	1.0000	0
Amount financed	20,000					
Prin & Int	Year 1 6,000.96	5,500	1		0.9533	5,243
	2 6,000.96	5,626	2		0.9032	5,112
	3 6,000.96	5,743	3		0.8663	4,993
	4 6,000.91	5,914	4		0.8252	4,884
	5 0.00	0	5		0.0000	0
	6 0.00	0	6		0.0000	0
	7 0.00	0	7		0.0000	0
	8 0.00	0	8		0.0000	0
	9 0.00	0	9		0.0000	0
	10 0.00	0	10		0.0000	0
	11 0.00	0	11		0.0000	0
(Cash rec'd) : sale of old eq	0				1.0000	0
\$20,000 Taxable gain (loss) on eqpt s:	0			1	0.9533	0
9.25% ITC recapture on disposition	0			1	0.9533	0
4.0 Inco costs or decr returns /y:	0		1	10	9.0560	0
\$500.02 INFLOWS					NET OUTFLOWS (1)	\$20,232
Savings or added returns from equip purch:						
Avoided repairs on old eqpt	5,000	3,500	1	1	0.9219	3,437
Reduced annual repairs	1,000	700	1	5	4.7342	3,314
1.24% Annual fuel savings	200	140	1	5	4.7342	663
4.96% Improved timeliness	0	0	1	5	4.7342	0
Cost recovery on eq purch (MACRS -less than 40% of assets purchased in 4th qtr; half-yr conv)						
	See li	10,000	3,000	1	0.9533	2,860
Annual Recovery	15.00%	1,500	450	1	0.9533	429
less depr lost	25.50%	2,550	765	2	0.9032	695
on trade & sal	17.25%	1,725	536	3	0.8663	464
	16.66%	1,666	500	4	0.8252	413
	16.66%	1,666	500	5	0.7872	293
	2.32%	232	250	6	0.7505	122
		0	0	7	0.7154	0
		0	0	8	0.6820	0
Inco in end value because of new machine purchase		5,000	3,500	5	0.9127	3,194
State Inv. Tax Credit			700	1	0.9533	667
					NET INFLOWS (2)	\$16,717
					NET PRESENT VALUE (2-3)	(\$3,515)

Fight new paint disease with careful analysis
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Total annual variable cost = \$7,459.50.

Total annual cost: \$7,459.50 + \$6,120 = \$13,579.50

Can you afford it?

The answer depends. Does any increase in income, decrease in expenses, reduction in operator labor or increased comfort, or income tax advantages total more than

\$13,579.50 for the machine. Also factor into your decision answers to these questions:

1. Does owning the machine help make better use of other equipment?
2. Does buying the machine mean I'll have to invest in other new or larger machines?
3. How much can I save on delays that would occur with the old machine?
4. How much labor will this machine save or replace? How will that labor be used?
5. Will I produce more with this machine?
6. Will capital invested here bring as high a return as investment elsewhere? ■