

MAKING CAPITAL INVESTMENT DECISIONS

Chapter 10

OUTLINE

1. Relevant Cash Flows
 - A. Opportunity Costs
 - B. Side Effects
 - C. Net Working Capital
 - D. Taxes
2. Pro Forma Financial Statements and OCF

RELEVANT CASH FLOWS

CAPITAL BUDGETING DECISIONS AND CASH FLOWS

The NPV and IRR are frequently used to evaluate investments and make capital budgeting decisions.

These methods consider the cost of an investment and the cash flows that result from undertaking a project.

We now consider which cash flows should be included in capital budgeting analysis.

CAPITAL BUDGETING DECISIONS EXAMPLE

Amazon is interested in building a new distribution center in Baton Rouge, LA. They estimate that 30,000 new people will enroll in Prime as a result and make Amazon their first stop for shopping. Below is Amazon's cash flows with and without the project. How would you calculate the NPV of the distribution center?

<i>Amazon</i>	2019	2020	2021	...
Cash Flows without New Center	\$143 M	\$156 M	\$175 M	...
Cash Flows of the New Center	<u>(\$30 M)</u>	<u>\$15 M</u>	<u>\$17 M</u>	...
Total	\$113 M	\$171 M	\$192 M	...

Discount the *Cash Flows of the New Center* after 2019 and subtract the initial cost of the investment to find the NPV.

RELEVANT CASH FLOWS FOR CAPITAL BUDGETING

The relevant cash flows are a firm's future cash flows that come about as a direct consequence of the project.

INCREMENTAL CASH FLOWS are this difference between a firm's future cash flows with a project and those without a project and should be used in the capital budgeting decision.

Cash flows that would exist without the investment should not be considered.

CAPITAL BUDGETING DECISIONS EXAMPLE

What are the incremental cash flows? Which cash flows should not be considered when evaluating this project?

<i>Amazon</i>	2019	2020	2021	...
Cash Flows without New Center	\$143 M	\$156 M	\$175 M	...
Cash Flows of the New Center	<u>(\$30 M)</u>	<u>\$15 M</u>	<u>\$17 M</u>	...
Total	\$113 M	\$171 M	\$192 M	...

This is the **STANDALONE PRINCIPLE**, whereby we assume that the project is separate from the firm and is evaluated on its own merits in isolation from other activities or projects.

IDENTIFYING RELEVANT CASH FLOWS

It's not always easy to determine if a cash flow should be included in the capital budgeting decision. Examples of costs and cash flows we need to think about carefully are:

SUNK COSTS

OPPORTUNITY COSTS

SIDE EFFECTS

NET WORKING CAPITAL

FINANCING COSTS

TAXES

SUNK COSTS

A SUNK COST is a cost that has been incurred, cannot be removed, and therefore should *not* be considered in an investment decision.

SUNK COSTS EXAMPLE

MGM Resorts International hires a consultant to evaluate whether they should build a new casino on the Las Vegas strip. Should the fee for the consultant be included in the NPV calculation with the “initial investment”?

NO. The fee needs to be paid regardless of whether or not MGM undertakes the investment.

OPPORTUNITY COSTS

An OPPORTUNITY COST is the most valuable alternative that is given up if a particular investment is accepted. These *should* be considered in the capital budgeting decision.

OPPORTUNITY COST EXAMPLE

MGM Resorts owns a large parking garage a few blocks down the Vegas strip from its current location. It acquired this structure a decade ago for \$30 million. Today, MGM can sell the garage for \$100 million. They decide to build a new casino at that location. Should we include this in the capital budgeting decision?

YES. We would include the \$100 million that we *could* have gotten for the garage as an opportunity cost when evaluating this project. The \$30 million, however, is a sunk cost.

SIDE EFFECTS

A SIDE EFFECT is a way a project can impact other projects at the firm. Side effects should be included in the capital budgeting analysis.

EROSION is a side effect whereby a new project negatively impacts cash flows of your current investments.

SIDE EFFECTS EXAMPLE

MGM Resorts builds the new casino on the strip, but in doing so pulls customers from its existing casino, the MGM Grand. Should we consider this in the NPV calculation?

YES. We should subtract the cash flows generated by customers moving from the old casino to the new one before we calculate the NPV of the new casino's cash flows.

NET WORKING CAPITAL

Recall NET WORKING CAPITAL is the difference between current assets and current liabilities.

We include *investments in net working capital* when evaluating a project. This includes purchasing of inventories, increases in accounts payable, and increases in cash.

As projects wind down, inventories are sold and accounts are paid off; therefore, the change in NWC is reversed in the final investment period.

NET WORKING CAPITAL EXAMPLE

MGM Resorts acquires new slot machines from suppliers on credit for the new casino. As a result, its accounts payable increases. Should this be included when evaluating a project?

YES. The increase in current liabilities affects net working capital.

FINANCING COSTS

FINANCING COSTS such as interest expense on debt used to finance the project are *not* included. This is because firms generally raise money for multiple projects, not just one.

FINANCING COSTS EXAMPLE

MGM Resorts issued bonds (raised debt) for this new casino project, as well as for other projects it is implementing in the US and globally. Should the coupon payments to bond holders be deducted from the cash flows the new casino generates?

NO. We don't include financing costs.

TAXES

All cash Flows should be considered after taxes have been paid.

TAXES EXAMPLE

MGM Resorts generates cash flows of \$100 M per year from the new casino. It pays \$20 M of these cash flows in taxes. Should we use $\$100 - \$20 = \$80$ M as the cash flows when computing the NPV?

YES. We always assume the incremental cash flows are after tax. Be sure to only pay the portion that the *individual project* contributes to the tax bill.

TO SUMMARIZE

We consider *after-tax incremental cash flows* when evaluating a project. Sunk costs and financing costs shouldn't be included in the analysis while opportunity costs, side effects, changes in net working capital, and taxes should be.

PRO FORMA STATEMENTS AND PROJECT CASH FLOWS

PRO FORMA FINANCIAL STATEMENTS

PRO FORMA is Latin for “as a matter of form.”

PRO FORMA STATEMENTS are financial statements, particularly the income statement, that project future years’ performance and standing.

We can use these statements to project cash flows of an investment opportunity.

EXAMPLE: WHOLE FOODS

Whole Foods is thinking about developing a new diet drink that has all the nutrients needed for daily life. It expects that it can sell 50,000 cans per year at \$4 each. The cost will be about \$2.50 each. Health fads usually come and go quickly, so this project has a 3 year useful life. A production facility will need to be rented at \$12,000 per year, and \$90,000 of manufacturing equipment (also with a life of 3 years) will be purchased. An investment of \$20,000 of net working capital is required, and the tax rate is 34%. They require a 20% return on this project. Should Whole Foods pursue this project?

EXAMPLE: WHOLE FOODS

Summarize a year's information in a pro forma income statement:

Sales (50,000 units at \$4/unit)	\$	200,000
Variable costs (\$2.50/unit)		125,000
Fixed costs		12,000
Depreciation (\$90,000/3)		30,000
EBIT	\$	33,000
Taxes (34%)		11,220
Net income	\$	21,780

EXAMPLE: WHOLE FOODS

To obtain the project cash flows, we use the following formula:

$$\text{Cash Flow}_p = \text{OCF}_p - \Delta\text{NWC}_p - \text{Capital Spending}_p$$

where

$$\text{OCF}_p = \text{EBIT}_p + \text{Depreciation}_p - \text{Taxes}_p$$

EXAMPLE: WHOLE FOODS

What's the project's OCF?

Sales (50,000 units at \$4/unit)	\$	200,000
Variable costs (\$2.50/unit)		125,000
Fixed costs		12,000
Depreciation (\$90,000/3)		30,000
EBIT	\$	33,000
Taxes (34%)		11,220
Net income	\$	21,780

$$\text{OCF} = 33,000 + 30,000 - 11,220 = 51,780$$

EXAMPLE: WHOLE FOODS

Now, we can build a timeline using the OCF, Δ NWC, and capital spending information from the problem:

	<i>Year</i>			
	0	1	2	3
Operating cash flow		\$ 51,780	\$ 51,780	\$ 51,780
Changes in NWC	\$ (20,000)			\$ 20,000
Capital spending	(90,000)			
Total project cash flow	<u>\$ (110,000)</u>	<u>\$ 51,780</u>	<u>\$ 51,780</u>	<u>\$ 71,780</u>

Notice that the NWC is recovered at the end of the project. The capital spending is on manufacturing equipment (the depreciable asset).

EXAMPLE: WHOLE FOODS

Using the Total Project Cash Flow, calculate the NPV and IRR.

	<i>Year</i>			
	0	1	2	3
Operating cash flow		\$ 51,780	\$ 51,780	\$ 51,780
Changes in NWC	\$ (20,000)			\$ 20,000
Capital spending	(90,000)			
Total project cash flow	<u>\$ (110,000)</u>	<u>\$ 51,780</u>	<u>\$ 51,780</u>	<u>\$ 71,780</u>

$$\text{NPV} = \$10,647.69$$

$$\text{IRR} = 25.76\%$$

Whole Foods should accept the project.

DEPRECIATION

Why do we subtract depreciation when calculating EBIT, only to add it right back in the OCF formula?

Income tax is calculated on the income *after* we deduct depreciation. The higher our depreciation expense, the lower our tax bill (all else equal).

Depreciation therefore has cash flow implications.

DEPRECIATION TAX SHIELD

The DEPRECIATION TAX SHIELD is simply the depreciation expense times the tax rate.

This is the increase to OCF by being able to “expense” depreciation.

DEPRECIATION TAX SHIELD EXAMPLE

Sales (50,000 units at \$4/unit)	\$	200,000
Variable costs (\$2.50/unit)		125,000
Fixed costs		12,000
Depreciation (\$90,000/3)		30,000
EBIT	\$	33,000
Taxes (34%)		11,220
Net income	\$	21,780

Sales (50,000 units at \$4/unit)	\$	200,000
Variable costs (\$2.50/unit)		125,000
Fixed costs		12,000
Depreciation		0
EBIT	\$	63,000
Taxes (34%)		21,420
Net income	\$	41,580

$$OCF = 33,000 + 30,000 - 11,220 = 51,780$$

$$OCF = 63,000 + 0 - 21,420 = 41,580$$

$$51,780 - 41,580 = 10,200$$

$$\text{Depreciation Tax Shield} = 0.34 \times 30,000 = 10,200$$

EXAMPLE 2: McDONALD'S

McDonald's is considering the development of a "Hoof & Bone" Burger, made of all the parts of the cow that doesn't go into the Big Mac. They plan on offering this sandwich as a limited-time 3 year engagement. A new factory will cost \$2.97 million, which will depreciate by the same amount each year to zero. They estimate that they will sell \$2,170,000 worth of burgers each of the year while incurring annual costs of \$865,000. Assuming a tax rate of 35% and a required return of 9%, should McD's undertake this project? Use both the NPV and IRR method.

EXAMPLE 2: McDONALD'S

Summarize information in a pro forma income statement.

Sales	\$	2,170,000
COGS		865,000
Depreciation (\$2.97M/3)		990,000
EBIT	\$	315,000
Taxes (35%)		110,250
Net income	\$	204,750

EXAMPLE 2: McDONALD'S

Find the OCF.

Sales	\$ 2,170,000
COGS	865,000
Depreciation (\$2.97M/3)	990,000
EBIT	\$ 315,000
Taxes (35%)	110,250
Net income	\$ 204,750

$$\text{OCF} = \text{EBIT} + \text{DEP} - \text{TAXES} = 315,000 + 990,000 - 110,250 = 1,194,750$$

EXAMPLE 2: McDONALD'S

Present the Total Project Cash Flow and find the NPV and IRR.

	<i>Year</i>			
	0	1	2	3
Operating cash flow		\$ 1,194,750	\$ 1,194,750	\$ 1,194,750
Changes in NWC	\$ -			\$ -
Capital spending	(2,970,000)			
Total project cash flow	<u>\$ (2,970,000)</u>	<u>\$ 1,194,750</u>	<u>\$ 1,194,750</u>	<u>\$ 1,194,750</u>

$$\text{NPV} = \$54,264.30$$

$$\text{IRR} = 10.02\%$$

McD's should develop the Hoof & Bone Burger.

SALVAGE VALUE

What if the equipment has a SALVAGE VALUE of \$360,000 in the final year, and it can be sold for that amount?

	<i>Year</i>			
	0	1	2	3
Operating cash flow		\$ 1,194,750	\$ 1,194,750	\$ 1,194,750
Changes in NWC	\$ -			\$ -
Salvage Value				\$ 360,000
Capital spending	(2,970,000)			
Total project cash flow	<u>\$ (2,970,000)</u>	<u>\$ 1,194,750</u>	<u>\$ 1,194,750</u>	<u>\$ 1,554,750</u>

$$\text{NPV} = \$332,250.35$$

$$\text{IRR} = 14.89\%$$

McD's should develop the Hoof & Bone Burger.

TO SUMMARIZE

Once we understand the relevant cash flows, we can develop pro forma statements for the life of the project and calculate the NPV and IRR.



TAKEAWAYS

TAKEAWAYS

1. We need to be sure to only include relevant cash flows when considering a project.
2. Relevant cash flows include opportunity costs, side effects, net working capital, and taxes.
3. Pro forma statements present projections for the cash flows that an investment opportunity yields.
4. Operating cash flow is calculated using the EBIT, adding depreciation, and subtracting taxes.

END.

