

Book Values, Market Values, Inflation, and Currency

Every number in the first four chapters came from a set of accounts, and every one of them recorded something that had already happened. From this chapter onward the course is about the future, and the transition requires a change of measuring instrument. Book value records what was paid; market value prices what is expected. They answer different questions, and confusing them is the most consequential error a junior analyst can make.

Two forces widen the gap between the two, and both are large in the markets this course is written for. **Inflation** erodes the meaning of a figure recorded in a previous year, so a balance sheet becomes a mixture of units of different sizes. **Currency movement** does the same thing abruptly and to only part of the balance sheet, which is why a devaluation can destroy a firm that has done nothing wrong.

HOW TO USE THIS CHAPTER

This chapter sets out why book and market values differ and when each is the right one, states the Fisher relation in exact and approximate form and sizes the error between them, gives the consistency rule that governs every real-versus-nominal calculation in the rest of the course, and classifies currency exposure into the three types that behave differently.

The videos take an importer through a devaluation and follow the damage in two places: the visible loss on the balance sheet, and the much larger loss on the income statement that nobody was looking at.

The case asks what a firm should have done differently, with the benefit of hindsight it did not have.

5.1 Two Ways to Value the Same Thing

An asset can be described by what was paid for it or by what it is worth. Accounting overwhelmingly chooses the first, and it does so for a good reason: the historical figure is verifiable. Someone wrote a cheque, and there is a document. A current valuation is an opinion, and opinions in audited statements create problems that are worse than the staleness they would cure.

THE TWO MEASURES

MEASURE	DEFINITION	PROPERTY
Book value	Original cost, less accumulated depreciation or amortisation	Verifiable, backward-looking, stale
Market value	What a willing buyer would pay today	Current, forward-looking, contestable

Four distinct forces separate them, and naming them individually is useful because they push in different directions and by different amounts.

- **Depreciation is a schedule, not a valuation.** A five-year life is an assumption. Assets routinely remain productive long after their book value reaches zero, and occasionally become worthless while substantial book value remains.
- **Inflation makes old figures small.** Land bought fifteen years ago is recorded in units that have since lost much of their purchasing power. The number is correct and the unit is no longer the one you are reading in.
- **Market conditions move independently of both.** Property near a new road is worth more for reasons unconnected to what it cost or how it has been depreciated.
- **The most valuable resources are often absent entirely.** A customer base, a trained workforce, a brand, a distribution agreement, and an operating licence usually enter the accounts only if they were purchased in a transaction.

The last of these produces the largest gaps. A services business can have almost nothing on its balance sheet and considerable value; a heavy-asset business can carry a large book equity and be worth less than it appears. **The ratio of the two numbers is itself informative.**

$$\text{Market-to-book ratio} = \text{Market value of equity} \div \text{Book value of equity}$$

A firm with book equity of 400 and market equity of 1,200 has a ratio of 3.0, and the 800 of difference is the market's estimate of economics the accounts do not capture. Read the ratio as a question rather than a verdict: a high value asks what the market believes exists that the accounts cannot see, and a value below 1.0 asks whether the assets are impaired, the returns are inadequate, or the market is wrong. All three answers occur.

When book value — or another basis — is the right number

Market value is not a universal replacement for accounting value. The purpose determines the basis: some questions are defined on book figures, secured lending uses realizable value, and insurance uses replacement cost.

- **Secured lending.** A lender advancing against equipment cares about its current realizable or forced-sale value. That figure may be neither accounting book value nor going-concern market value, so it requires a current appraisal and an explicit liquidation discount.
- **Tax.** Depreciation allowances and capital-gains computations are defined on historical cost by statute. The market view is irrelevant.
- **Covenants and regulatory capital.** These are usually defined on book figures precisely because book figures are hard to argue with.
- **Insurance and replacement.** The question is the cost of replacing an asset, which is a third number again, distinct from both.

IN THE VIDEOS *Videos 5.1 and 5.2 work through a business whose most valuable assets appear nowhere on its balance sheet, and one whose largest recorded asset is worth a fraction of its carrying value.*

5.2 Debt, Equity, and the Valuation Identity

Chapter 1 gave the accounting identity in book terms. The same identity holds in market terms, and in that form it becomes the equation that the whole of Chapters 8 through 11 rests on.

$$\text{Enterprise value} = \text{Market value of equity} + \text{Debt} - \text{Cash}$$

Read it as a statement about claims. The **enterprise value** is the value of the operating business itself, independent of how it happens to be funded. Whoever buys that business must satisfy the lenders and the owners, and receives the cash that comes with it. Rearranged, it gives the bridge used in every valuation you will perform.

$$\text{Equity value} = \text{Enterprise value} - \text{Debt} + \text{Cash}$$

The distinction is worth fixing now, because it is the source of a persistent error in Chapter 11. **Enterprise value belongs to all providers of capital; equity value belongs to the owners alone.** Any measure of performance that is stated before interest — operating income, EBITDA, free cash flow to the firm — is available to both classes of claimant and therefore pairs with enterprise value. Any measure stated after interest — net income, earnings per share, free cash flow to equity — belongs to the owners and pairs with equity value. Crossing the two produces answers that are wrong by the size of the debt.

A second consequence is worth noticing. Because equity is the residual, **a change in enterprise value lands entirely on equity.** A business worth 1,000 with 400 of debt has 600 of equity; if the business becomes worth 1,200, equity becomes 800. Enterprise value rose by 20 percent and equity by 33. Leverage amplifies in this direction exactly as it does in the other, which is the market-value statement of the point Chapter 2 made about return on equity.

IN THE VIDEOS Video 5.3 develops this identity and shows why it is the equation every valuation in Chapters 8 through 11 is arranged around.

5.3 Inflation and the Fisher Relation

A promise of 1,000 in a year is not worth 1,000 today even when it is completely certain, because prices will have moved in the meantime. That statement contains no risk of any kind, and it is the first of the three reasons for discounting that Chapter 6 assembles.

The relation between rates that include inflation and rates that do not is exact, and it is multiplicative rather than additive.

$$(1 + \text{nominal rate}) = (1 + \text{real rate}) \times (1 + \text{inflation rate})$$

The approximation everyone uses — add the real rate and inflation — comes from multiplying out and discarding the cross term. The discarded term is the product of the two rates, so the error is small when both are small and grows quickly when inflation is high.

EXACT AGAINST APPROXIMATE, AT A 4% REAL RATE

INFLATION	EXACT NOMINAL	APPROXIMATE	ERROR
3%	7.12%	7.00%	0.12pp
6%	10.24%	10.00%	0.24pp
10%	14.40%	14.00%	0.40pp
15%	19.60%	19.00%	0.60pp
20%	24.80%	24.00%	0.80pp
30%	35.20%	34.00%	1.20pp

At three percent inflation the shortcut is harmless. At twenty it costs most of a percentage point, and a percentage point on a discount rate moves a long-dated valuation by several percent. **In the markets this course is written for, use the exact form.** It costs one extra keystroke.

The consistency rule

The most important use of the Fisher relation is not converting rates but enforcing a rule that governs every valuation in the rest of the course.

Discount nominal cash flows at nominal rates, and real cash flows at real rates.

Either pairing gives the identical answer. Mixing them gives a wrong one, and the error is large. Take a flow worth 100 in today's purchasing power, arriving in three years, with inflation at 12 percent and a real rate of 6 percent — a nominal rate of 18.72 percent.

THE TWO CORRECT ROUTES, AND THE INCORRECT ONE

METHOD	AMOUNT	PRESENT VALUE
Nominal flow at nominal rate	140.49	83.96
Real flow at real rate	100.00	83.96
Real flow at nominal rate	100.00	59.76

The two correct routes agree exactly, as they must. The third understates the value by 29 percent, and it is a common mistake because it looks conservative rather than wrong — the analyst forecasts in today's prices, applies a rate quoted in the market, and never notices that inflation has been deducted twice.

In practice nearly everyone works in nominal terms, for two reasons. Market rates are quoted nominally, so the discount rate arrives in that form. And most cash flows are easier to forecast nominally, because contracts, wages, and prices are set in currency of the day. **The exception is a long-lived project in a high-inflation currency**, where forecasting nominal amounts twenty years out compounds an inflation assumption into meaninglessness, and working in real terms is more honest.

IN THE VIDEOS *Video 5.4 works through the relation and shows what it means for a business quoting a fixed price a year ahead.*

5.4 Currency Exposure

Currency risk is not one thing. It has three distinct forms, which arrive at different times, appear in different places in the accounts, and require different responses. Firms in the markets this course covers commonly hedge the smallest of the three and leave the largest untouched.

THE THREE EXPOSURES

TYPE	WHAT IT IS	WHERE IT APPEARS
Transaction	A monetary amount the reporting entity must receive or settle in foreign currency	Remeasurement and settlement gain or loss
Translation	A foreign operation's statements converted into the group's reporting currency	Consolidated balance sheet and reserves
Economic	The effect of the rate on future competitiveness and costs	Nowhere, until it reaches the margin

Transaction and translation exposure

Transaction exposure is the easiest to see and to manage, because the amount and the date are both known. An importer with an invoice of \$200,000 due in ninety days knows exactly what is at risk and can fix the rate with a forward contract, match the exposure against dollar receipts, or accept it deliberately. A foreign-currency loan held by the reporting entity belongs in this category too: it is a fixed foreign-currency amount that must be settled.

Remeasuring a foreign-currency loan can produce a dramatic balance sheet even before cash settlement. Consider a firm with a dollar loan of \$200,000 when the rate moves from 12 to 18 units of local currency per dollar — a 50 percent devaluation of the local unit.

A DOLLAR LOAN THROUGH A DEVALUATION

ITEM	BEFORE	AFTER
Exchange rate	12.00	18.00
Loan, in local currency (millions)	2.40	3.60
Equity, in local currency (millions)	1.50	0.30

Four-fifths of the equity has been destroyed. **No cash moved at the reporting date, no new decision was taken, and no operating figure changed.** The loan was remeasured, and because equity is the residual, the loss landed on it. The interest obligation moves in the same proportion: eight percent on \$200,000 is \$16,000, which cost 192,000 in local currency before and costs 288,000 after, so interest cover deteriorates in the same instant.

Translation exposure is different. It arises when a parent converts a foreign subsidiary's functional-currency statements into the group's reporting currency. That conversion can move reported assets, liabilities, and reserves without changing the subsidiary's local economics. The distinction

is practical: a loan the reporting entity must settle is transaction exposure and is remeasured; a foreign operation being consolidated creates translation exposure.

This is why lending in a currency the borrower does not earn is the most reliably destructive financing decision available. The loan looked cheap because dollar rates were lower than local rates, and the difference between those rates was compensation for exactly the risk that then occurred. **A cheaper foreign rate is not a saving; it is a price for bearing currency risk**, and a firm whose revenue is entirely local is being paid to take a risk it cannot absorb.

Economic exposure

The third form is the largest and the one no accounting entry announces. Economic exposure is the effect of a currency movement on the future profitability of the business, through input costs, competitive position, and pricing power.

A devaluation raises the local-currency cost of every imported input immediately. If a substantial share of cost of sales is denominated in a foreign currency, the gross margin moves at once, and it moves on the entire volume of the business rather than on a single balance-sheet line. **The operating damage is routinely several times the balance-sheet damage**, and it appears a quarter later, spread across cost of sales where nobody is looking for a currency loss.

Restoring the margin then requires a price increase, and whether the market will bear it is the real question. That question is not financial: it depends on competitors' import content, on whether customers can substitute, and on how quickly the firm can reprice. **The exposure is a property of the business model, not of the balance sheet**, and it is why the analysis has to begin with the cost structure rather than with the debt schedule.

WHAT TO DO ABOUT EACH

EXPOSURE	INSTRUMENTS	STRUCTURAL RESPONSES
Transaction	Forwards, options, currency accounts	Invoice or borrow in the currency of receipts
Translation	Net-investment hedge, if needed	Report and explain; hedge only when the reporting volatility matters
Economic	Not directly hedgeable	Local sourcing, pricing flexibility, foreign revenue

The single most effective response appears in the first row and is structural rather than financial. **Match the currency of your borrowing to the currency of your revenue**. A firm that earns locally and borrows locally has no foreign-currency transaction exposure on its debt, and a higher interest rate that it should regard as insurance rather than as waste.

Measuring the exposure from a set of accounts

The three exposures can be estimated from ordinary financial statements, and doing so takes about twenty minutes. The procedure is worth having as a checklist, because nothing in the accounts is labelled "currency exposure" and the largest component is never disclosed at all.

- **Balance sheet.** List every asset and liability denominated in a foreign currency — usually import payables, foreign loans, and foreign-currency deposits. The **net** foreign-currency

liability is transaction exposure subject to remeasurement. A firm with foreign liabilities exceeding foreign assets loses on a devaluation, in proportion to the difference.

- **Committed transactions.** Take the order book and the payables ledger, and identify amounts fixed in a foreign currency with a settlement date. This is the transaction exposure, and it is the only one with both a known amount and a known date.
- **Cost structure.** Estimate the share of cost of sales that is foreign-denominated, whether or not it is invoiced that way. This is the difficult and important step: imported goods bought from a local distributor who prices off the exchange rate are a foreign-currency cost even though every invoice is local.
- **Revenue structure.** Estimate the share of revenue that is foreign-denominated or foreign-linked. Exports, and local sales priced against an imported benchmark, both belong here and both offset the cost exposure.

The last two produce the economic exposure, and the calculation is a subtraction: **the foreign-denominated share of costs, less the foreign-denominated share of revenue, applied to the size of the business.** A firm with 60 percent of its costs in foreign currency and none of its revenue has an economic exposure many times its balance-sheet exposure, and no accounting entry anywhere will say so.

Two failures recur when this is done in practice, and both understate the answer. **Costs are classified by the currency on the invoice rather than by what actually drives the price**, which misses every imported input bought through a local intermediary. And **the exposure is assessed against the current cost structure rather than against what happens after a move**, which misses the fact that some substitution is possible and much of it is not.

IN THE VIDEOS Videos 5.5 and 5.6 follow one importer through a devaluation, first on the balance sheet and then through the margin, where the loss is several times larger.

5.5 What This Means for the Rest of the Course

Three things established here are used constantly from Chapter 6 onward.

- **Value comes from expected future cash, not from recorded past cost.** Every technique from here on discounts a forecast. Book value appears again only as a cross-check and as a lender's floor.
- **Inflation is one of the three components of a discount rate**, and the only one that requires no risk at all. Chapter 6 adds the other two.
- **Rates and cash flows must be stated in the same currency and on the same basis.** A shilling flow discounted at a dollar rate is wrong by the inflation differential, which Chapter 10 shows how to convert properly.

5.6 Reference

CHAPTER 5 • FORMULA REFERENCE

QUANTITY	FORMULA	NOTE
Market-to-book	Market equity / Book equity	A question, not a verdict
Enterprise value	Equity + Debt – Cash	Belongs to all capital providers
Equity value	Enterprise value – Debt + Cash	The bridge used in Chapter 9
Fisher, exact	$(1+\text{nominal}) = (1+\text{real})(1+\text{inflation})$	Use this above about 10% inflation
Fisher, approximate	$\text{nominal} \approx \text{real} + \text{inflation}$	Error is the product of the two rates
Consistency rule	Nominal flows at nominal rates; real at real	Mixing understates value badly
Real rate from nominal	$(1+\text{nominal})/(1+\text{inflation}) - 1$	The exact inversion

CARRY FORWARD

Book value records the past; market value prices the future. Both are correct measures of different things, and each has purposes for which the other is simply the wrong number.

Enterprise value pairs with pre-interest measures; equity value pairs with post-interest measures. Crossing them is wrong by the size of the debt, and it is the most common error in Chapter 11.

Use the exact Fisher relation wherever inflation is above about ten percent, and never discount a real flow at a nominal rate.

A cheap foreign-currency loan is a price for bearing currency risk, not a saving. Match the currency of borrowing to the currency of revenue.