

Why Purchase Price Allocation?

We need to allocate the purchase price in an M&A deal because we often **pay more for the seller than what their balance sheet says they're worth**.

When that happens, we run into a problem because the **combined balance sheet** will not balance. Let's look at a simple example to see what happens:

Combining the Balance Sheets:					
Buyer:			Seller:		
Assets:		\$ 1,000	Assets:		\$ 200
Liabilities:		\$ 800	Liabilities:		\$ 100
Equity:		\$ 200	Equity:		\$ 100

Let's say that we pay \$100, in cash, for the seller – exactly what its balance sheet indicates that it's worth:

Combining the Balance Sheets:					
Buyer:		Seller:		Combined:	
Assets:	\$ 1,000	Assets:	\$ 200	Assets:	\$ 1,100
Liabilities:	\$ 800	Liabilities:	\$ 100	Liabilities:	\$ 900
Equity:	\$ 200	Equity:	\$ 100	Equity:	\$ 200

The combined balance sheet remains in balance because we've wiped out the seller's equity since it no longer exists – and the buyer's assets are down by \$100 because it used \$100 of cash to buy the company.

But now what happens if we pay \$150 for the seller rather than \$100?

Combining the Balance Sheets:					
Buyer:		Seller:		Combined:	
Assets:	\$ 1,000	Assets:	\$ 200	Assets:	\$ 1,050
Liabilities:	\$ 800	Liabilities:	\$ 100	Liabilities:	\$ 900
Equity:	\$ 200	Equity:	\$ 100	Equity:	\$ 200
Balanced?	OK!	Balanced?	OK!	Balanced?	(\$50)



Now we have a problem because our assets have decreased by \$150, but the other side of the balance sheet has decreased by \$100... so the combined balance sheet goes out of balance and we need to make up the difference.

When that happens we create an asset called **Goodwill** to “plug the hole” and get the balance sheet to balance, and make a variety of other adjustments.

Here are the steps you use when **allocating the purchase price** in an M&A (or LBO) deal:

1. Determine the **Purchase Premium**.
2. Calculate **Write-Ups** and **Intangibles**
3. Reset the seller’s **Tax Basis**.
4. Calculate new **Goodwill**.

We’ll go through each of those steps now and show you an example of what it might look like in a real model:

Determine the Purchase Premium

This part is designed to give you a “rough idea” of how much in new Goodwill you’ll need to create. It will be further adjusted once you complete the rest of the steps, but this is useful to get an estimate. In a simple model, you can even skip the rest of the steps here.

Here’s what a calculation to determine the Purchase Premium would look like:

Goodwill Calculation:			
Equity Purchase Price:		\$	15,921
Less: Seller Book Value:			(3,739)
Plus: Write-Off of Existing Goodwill:			1,991
Total Allocable Purchase Premium:		\$	14,173

What’s the logic? You **always** start with the Equity Purchase Price that the buyer is paying for the seller – **NOT the Enterprise Value** – because the Equity Purchase Price reflects how much cash, debt, and stock you’re using to pay for the seller in the first place. Yes, the “real” price may be different if you refinance debt but for purposes of calculating Goodwill, we care about how much you pay for the **equity** of the company.

You wipe out the seller’s book value – its shareholders’ equity – because it no longer exists as an independent entity. Technically, this should be “Common Book Value” and you should exclude Preferred Stock and Noncontrolling Interests (they may be treated differently) but we won’t get into that for now.

Finally, you write off existing Goodwill because we’re “resetting” everything on the seller’s balance sheet. We want to start from scratch and come up with a Goodwill number that reflects the *most recent* acquisition – namely, the buyer acquiring the seller in this deal.

So that gives you the “Allocable Purchase Premium,” which is close to, but not exactly the same as, the total Goodwill that will be created here.

Calculate Write-Ups and Intangibles

Remember from your accounting that for *most* companies, items on the balance sheet are recorded at **cost**: what it cost to purchase them in the first place (minus accumulated depreciation in the case of Net PP&E).

There are some exceptions (e.g. commercial banks mark-to-market their balance sheets), but for most non-finance companies, balance sheet line items reflect the price originally paid for them.



That’s usually acceptable, but sometimes the **market values of those items drift significantly from the book values** over time. You see this a lot with PP&E, where the value of real estate and land may actually increase over time – even when the balance sheet indicates that it has stayed the same or decreased due to the accounting convention of depreciation.

To remedy that, you often assume a **write-up** to the fair market value of items such as PP&E, inventory, and other assets when a deal takes place; you also assume that some of the Allocable Purchase Premium goes into **Intangible Assets** to reflect the value of items like brand name, intellectual property, customer relationships, and so on.

How can you determine the percentages to use when writing up or creating these items?

1. Look at previous transactions involving **similar companies** and see what numbers were used.
2. Ask **auditors and accountants** to value these assets and see what the fair market value should be (this is what really happens when an M&A deal closes).
3. Make an **estimate** based on the industry, company type, and transaction size.

Since we don’t have access to the data for #1 and #2, we’re going to use method #3 here and assume a moderate write-up to PP&E:

Fixed Asset Write-Up:			
PP&E Write-Up %:		10.0%	
PP&E Write-Up Amount:		163	
Depreciation Period (Years) - Book:		8	
Yearly Depreciation Expense - Book:		20	



If this company had little in the way of property and land, we might assume a lower number because PP&E assets such as machinery and equipment actually *do* lose value over time. In this case, presumably the company owns more of its own property.

Notice also how we assume a **Depreciation Period** for this write-up. That's important because just as normal PP&E must be depreciated over time, so must any type of PP&E write-up. The average useful life of PP&E varies from 5 to 10 years, so here we're picking something in the middle of the range at 8 years.

The number to use for Intangible Assets varies based on the company type – companies without much IP, brand value, or direct customer relationships tend to have lower values for this one.

Whereas companies in, say, the technology or biotech industry or anything else where IP is important and where research & development is crucial tend to have higher values.

Here, we're assuming that **20%** of that Allocable Purchase Premium goes into Intangibles:

Intangible Asset Write-Up:		
Excess Purchase Price to Allocate:	14,173	
% Allocated to Intangibles:	20.0%	
Intangibles Write-Up Amount:	2,835	
Amortization Period (Years) - Book:	5	
Yearly Amortization Expense - Book:	567	

Just as with the PP&E write-up, we're assuming an **Amortization Period** here. The standard in merger models is **5 years**, so that's what we're using in this model. There is a massive yearly amortization expense as a result, but later on in the analysis we'll look at pro-forma numbers that exclude that expense.

The idea here is, "We're paying a lot for this company's intangible assets... but they'll decline in value over time. So let's reflect that initial value, and then decrease it over the years."

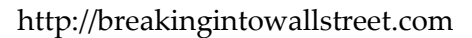
Reset the Seller's Tax Basis

Remember, you're "wiping the slate clean" when the buyer acquires the seller in an M&A deal.

As a result, previous tax treatments such as deferred tax liabilities and deferred tax assets go away and you replace them with the new tax treatment gained as a result of this deal.

So this part is fairly simple: you just write off the seller's entire existing DTL and DTA balances (this is not always the case – see the bottom of this document) and then replace them with a **new** deferred tax liability, which is equal to (Intangibles Write-Up + PP&E Write-Up) * Buyer's Tax Rate.

Remember that deferred tax liabilities represent **taxes that you will owe to the government in the future**.



Here's a simple example of how it works and why a DTL gets created:

BUT in reality, they are not deductible on the company's *tax* financial statements, meaning that they will owe the government a lot of money in the future:

Tax Operating Income:		100	110	120	130	140
Less: Amortization of Intangibles:		-	-	-	-	-
Less: Depreciation of PP&E Write-Up:		-	-	-	-	-
Cash Taxable Income:		\$ 100	\$ 110	\$ 120	\$ 130	\$ 140
Cash Taxes:		40	44	48	52	56
Deferred Tax Liability:	\$ 44	\$ 36	\$ 28	\$ 20	\$ 12	\$ 4



You can see that over time as the company pays more and more in cash taxes (\$8 more than book taxes each year), the DTL also decreases by \$8 each year, and it will eventually go to \$0 at the end of the period.

So that is why a DTL gets created as part of this process: it reflects the fact that the buyer is “taxed” on any asset write-ups, and must pay those taxes over time.

If we did not write up any assets and if we had created no intangibles, then we would also not create a deferred tax liability. But since both of those do exist, we create the DTL and make it equal to the write-up amount times the buyer’s tax rate – that’s the total amount of taxes they’ll owe in the future.

Putting It All Together: How to Calculate Goodwill

This is the easiest part of the entire process – just think about what each item we’ve calculated so far does to the amount of new Goodwill required:

- If an asset goes *up* (write-up) that means you need *less* Goodwill afterward.
- If an asset goes *down* (write-down) that means you need *more* Goodwill afterward.
- If a liability goes *up* (write-up) that means you need *more* Goodwill afterward.
- If a liability goes *down* (write-down) that means you need *less* Goodwill afterward.

Here’s an example calculation:

Goodwill Calculation:			
Equity Purchase Price:			\$ 15,921
Less: Seller Book Value:			(3,739)
Plus: Write-Off of Existing Goodwill:			1,991
Total Allocable Purchase Premium:			\$ 14,173
Less: Write-Up of PP&E:			(163)
Less: Write-Up of Intangibles:			(2,835)
Less: Write-Off of Existing DTL:			(584)
Plus: Write-Off of Existing DTA:			234
Plus: New Deferred Tax Liability:			921
Total Goodwill Created:			\$ 11,747

You can see that the new Goodwill created is within range of our Allocable Purchase Premium – \$12 billion vs. \$14 billion – and the large Intangible Asset Write-Up explains most of the difference.

Generally, the new Goodwill is less than the Allocable Purchase Premium but it depends on how much of a write-up there is, the tax rates, and more.



Once you're done calculating all this, you would then jump into the balance sheets of the buyer and seller and begin the process of combining them.

More Advanced Purchase Price Allocation

The summary above describes how you might allocate the purchase price in a quick model when you don't care about the deal structure or the additional details on tax treatment, net operating losses (NOLs), and so on.

But there are some more advanced items to think about:

- Here, we've assumed that the deal is structured as a **stock purchase** where the buyer acquires 100% of the seller's common stock. But there are also **asset purchases** and **338(h)(10)** deals (in the US), and those all have different implications for taxes, new line items, write-ups, write-downs, and more.
- What happens if the buyer and/or seller have net operating losses (NOLs)? Those will also affect the DTLs, DTAs, and everything else tax-related above.
- It's not quite correct to say that the existing DTAs is always written down – it depends on the deal type and the existence and magnitude of NOLs.
- You may also write-up or even write-down the values of other assets, such as Inventory.
- You may have write-downs that last many years instead of just at the time of the transaction – for example, Deferred Revenue is often written down over several years because only the "profit portion" is allowed to be recognized post-transaction.

We cover all those points and more in the **Advanced Modeling** course on the *Breaking Into Wall Street* site, based on a case study of Microsoft's proposed \$44 billion acquisition of Yahoo.