

Plant Assets (Property, Plant and Equipment)

Have you ever wondered what a company's assets are? Recall an asset is a resource that a firm holds, which will produce future economic benefits to the firm. An easy example is cash.

Let's take a look at Moderna, the pharmaceutical company, which created one of the m-RNA vaccines for COVID-19. If we look at Moderna, we can see that they own many things. Some things physically exist and are useful for a long time, like the factory and equipment used to produce their vaccines. But they also own assets that don't exist physically, like their technology and patent on their mRNA vaccine. Both are assets in their own right, and are valuable in their own way. How do we keep track of the value of these assets? How do we account for any changes in the asset's value over time?

Assets come in two types: **tangible and intangible**. Essentially, you can physically touch or hold tangible assets, while intangibles do not have physical substance. Tangible assets include land, buildings, and equipment, while intangibles include patents, copyrights, and trademarks.

In this session, we will focus on PP&E, or Property, Plant, and Equipment, which refers to **long term tangible assets that bring future economic benefit** to the company and **are not sold to customers**.

Now that you know what PP&E, Property, Plant, and Equipment refers to, let's look at it from a Financial Accounting perspective. It all starts when a company first acquires the asset, let's say a machine. The machine is bought with the company's cash, and then used for a few years until its **useful years** are over. At which point, the machine is disposed of.

Now that you know what PP&E is, how do we account for it? There are three phases that an asset goes through. First, an asset will be acquired. Next, it will be used, over its **useful life**. Finally, the asset is disposed of at the end of its useful life.

Let's take a closer look at every point of this timeline. What are the costs associated with the asset when a company initially acquires it? Take for example, a company purchases a piece of land. Upon purchasing, they not only have to spend money on the plot of land, but they must also pay for the real estate fees, taxes, and any required construction that makes the land usable **before they can start using it**. **All the expenses that are required to make an asset usable will have to be included** in the actual cost of acquiring that asset. In the journal entry, we will record this under the **Plant Asset account**: Debit Plant Asset and Credit Cash.

On the other hand, when buying equipment, our company needs to pay for the equipment, but also additional fees like setup costs to make it usable. **We need to record the total amount spent to acquire the asset and add any amounts needed to make it ready for use**. Buying equipment without

setting it up would result in useless equipment, so the setup cost is **inseparable** from the equipment cost. We will debit the plant asset account, and credit cash.

Next, over the course of the useful life of a plant asset, a company may incur expenditures in using the assets. During an asset's useful life, the company may need to incur a **revenue expenditure**, or a **capital expenditure**.

The first one, Revenue Expenditures, are expenses that ensure the plant asset **maintains productive capacity**. This includes expenses relating to maintenance and repairs, rent, utilities, and office supplies. These expenses are recorded directly to their own specific expense accounts. Maintenance and Repairs are debited, and Cash is credited.

Plant assets have a lifespan. We call this the asset's **useful life**. Useful life is an estimate of how long it will be useful for the company. It is usually expressed in time, but we will discuss other units later too. Note that useful life is not based on how long an asset will last.

Over the course of this useful life, there will be **revenue expenditures or capital expenditures** associated with the asset. Revenue expenditures are expenses that help the asset **maintain productive capacity**. Think repair costs and utility costs to keep the asset running and performing optimally. These expenses are recorded in their own accounts, for example a debit to Maintenance and Repairs and a credit to cash.

The second type of expenditure that may be incurred during an asset's useful life is a Capital Expenditure, which are expenses utilized to **expand the productive capacity**. These expenses are made on improvements that extend the useful life, therefore are directly recorded to the Plant and Asset account: Debiting Plant Asset and Crediting Cash.

Capital expenditures **improve the asset's useful life** making the asset last longer. Because we substantially improve the asset, we debit the plant asset's account and debit cash.

Assets get worn out over their useful life. Imagine we have a machine that cuts pieces of metal into shape. When brand new, it can cut ten sheets of metal at once. However, after some use, the blade gets worn down and it can now only cut six sheets of metal at once. The machine is now less useful to the company, and not able to bring the same benefit it once did. So how does this impact the company's accounting for the asset? Well, we use an accounting method called depreciation to represent this reduction. It is a cost allocation process, where the acquisition cost is matched systematically, and periodically to the periods benefits by their use. This cost is debited as depreciation expense.

This is matched with a credit to the asset's **accumulated depreciation** account, which is a contra-asset account specific to each asset that tracks the total value lost. As a plant asset is used, journal entries are made each period to allocate the dollar amount of depreciation.

To calculate asset value after depreciation, we will need 3 things

1. The initial acquisition cost, in dollars
2. The asset's useful life, in units of time or usage, for example years or units of activity
3. The residual or salvage value, in dollars, which represents the asset's value at the end of its useful life

With this information, we know the depreciable cost, or the value that the asset loses over its useful life, which is acquisition cost minus residual

There are three main depreciation methods: **Straight Line, Units of Activity, and Declining Balance**. Companies must follow one depreciation method over the entire useful life of an asset. Let's take a closer look at each method.

The first method is the Straight Line Method. This method of depreciation is the simplest, it gives the same depreciation expense in dollars for every year.

The second method is units of activity, where the asset is depreciated based on usage, like "kilometres driven" or "hours used".

The last method is double declining balance, which assumes assets lose value more quickly in the beginning of its useful life. Depreciation expense starts out higher then goes down over time, reflecting the situation where assets are more useful early on, but whose value declines sharply over time as they become obsolete.

At the end of an asset's useful life, a company can sell, dispose of, or exchange an asset. Journal entries will reflect both the removal of the asset and its associated accumulated depreciation.

If a company sells the asset for more than its book value at time of sale, the company makes a gain on disposal. A gain on disposal is recorded in the "Other revenues and gains" section of the income statement, and is much like the Revenue account, which also has a credit normal balance.

On the other hand, if a company sells the asset for less than its book value at time of sale, the company makes a loss on disposal. This is recorded in the "Other expenses and losses" section of the income statement, and is much like the Expense account, which also has a credit normal balance.

A company can also retire an asset by not using it. If the asset's accumulated depreciation equals its acquisition cost at the moment of disposal, the asset is considered fully depreciated and has zero book value. The journal entry looks like this: (*see video for entry*)

However, if we retire an asset before it is fully depreciated and we receive no cash for it at all, we incur a loss on disposal. This could happen during a flood, for example, where a company has no choice but to dispose of assets before the end of their original useful life. The loss is the difference between the acquisition

cost and the accumulated depreciation at the point of disposal. (*see video for entry*)

Having covered tangible assets, let's think back to companies like Moderna, it does not only own tangible assets. We mentioned in the beginning that their intangible assets are also valuable in their own right, which means that they need to be accounted for in our financial statements as well. Although both are assets, there are some differences when it comes to acquisition, depreciation, and disposal.

Now you know how to record the various journal entries for plant assets! To summarise, we went over how to account for the acquisition of PP&E, how to account for the additional revenue and capital expenses an asset may acquire over time, how to account for the depreciation of asset value over time, and how to account for asset disposal. We also briefly discussed intangible assets, where we identified Moderna's technology and patents as their non-physical but valuable assets.