

The Effects Of Asset Modeling And Tax Depreciation On Companies Future Cash Flows.

Ngu Kanti Hedris, Atanga Desmond Funwie

Kesmonds International University, School of Business & Management Sciences, Department of Economics & Finance

Email address:

ngukanti@kesmondsuniversity.org, atanga@kesmondsuniversity.org

To cite this article:

Authors: Ngu Kanti Hedris, Atanga Desmond Funwie. Paper Title:
The Effects Of Asset Modeling And Tax Depreciation On Companies Future Cash Flows.
IQ Research Journal of IQ res. j. (2023)2(9): pp 01-06. Vol. 002, Issue 09 09-2023, pp.0592-0598

Received: 29 08, 2023; Accepted: 22 09, 2023; Published: 30 09, 2023

Keyword

Effects, Asset Modeling,
Tax Depreciation,
Companies' Future Cash
Flows.

Received:
29 08, 2023

Accepted:
22 09, 2023

Published:
30 09, 2023

Abstract

The ultimate goal of this article is to model how governments in many jurisdictions grant concessions to companies by increasing their tax basis, thereby depleting taxable income. These thereby allow companies to use tax basis rather than accounting depreciation to decrease taxes. The main takeaway from this article is that, because these tax depreciation numbers are higher, it means that the tax basis is getting driven down quicker than the PPE balance. In fact, the whole reason that the ending PPE balance value is higher than the ending tax basis value is because the tax basis has been driven down over time by virtue of the fact that these tax depreciation numbers have been higher in recent years.

1. Introduction:

We just completed a relatively detailed build of the depreciation schedule for an article titled ‘The Effects of Depreciation on the Useful Life of an Asset’. And there were some tricky formulas in there. Let's move ahead. And start thinking about the asset schedule. It will be much more straightforward to build, but there are some concepts in there that we'll need to cover. Let's get started. Let's move ahead. We want to think about the accounting basis versus the tax basis, which is essentially an asset. Values need to be tracked for accounting purposes and also for tax purposes.

1.1 Purpose of the study

The purpose of the study was to model how governments in many jurisdictions grant concessions to companies by increasing their tax basis, thereby depleting taxable income.

1.2 Significance of the study

Most governments will allow companies some form of accelerated depreciation for tax purposes. Governments often offer some form of accelerated depreciation for tax purposes to help companies defer some of their taxes. Into the future. This helps free up cash flow for companies..

2. Literature Review:

These two are similar in terms of concept, but there are some differences that we're going to need to consider. Let's take a look at an illustration. We want to think about the tracking of asset values here. And we want to focus first on the accounting basis. We refer to the accounting basis as property, plant, and equipment, or PPE. This is going to be tracked and reported on the company's IFRS financial statements. There's another group to consider that also tracks asset values. It's the government. We refer to this as the tax basis. As we can see, this is tracked by the government, and it's going to be used to determine taxable income. So we have a situation here where the value of assets is being tracked, but it's being tracked by two groups: effectively, the accounting group here is tracking the value of the assets, and then Right here, the government is tracking the value of the assets (Financial modeling and valuation analysis, 2020). Operational modeling (Corporate Finance Institute Canada) We refer to this one because of the tax basis. We want to look first at the accounting basis, and then, after that, we're going to look at the tax basis.

Let's move ahead now to look at the asset schedule for the accounting basis. As you would remember, we

want to think of all of our schedules as having three parts, as shown on the right-hand side: the first being the business section, where we enter some figures. In this case, we're going to need the opening PPE Balance CapEx additions in accounting depreciation; some of these figures might be found on the depreciation schedule that we just completed. The next section of our schedules is going to be where we calculate some figures. In this case, we're going to need to calculate the future balances for the property, plant, equipment, or people you need. These are going to be calculated using something called a corkscrew formation, which we're going to cover in a moment at the bottom of our schedules. We're always going to have a section where we can take figures and exit them from the schedule. In this case, it's the PP and E amounts that we're going to need for each. These would likely flow into a balance sheet at a later time. This is an overview of the asset schedule for the accounting basis. Now let's move forward and take a look at the asset schedule for the tax basis. As we move forward, we're going to see that for the tax basis, again, there are going to be three parts to the schedule. First up, we're going to enter information. We need the opening tax bases, CapEx editions, and the tax depreciation rate. We also need the first-year tax depreciation. Assumption. We'll cover this a little bit later. Now we transition into the section where we're performing calculations. We're going to need to calculate the future balances for the tax basis. We're going to do this also inside a corkscrew formation, which we'll get into in a minute. Finally, in the section at the bottom where we're going to exit out of the schedule, we're going to need the ending tax basis amounts for each. This is going to allow us to calculate our future tax depreciation. Let's move forward now and familiarize ourselves with this corkscrew formation. Essentially, a corkscrew is a structure that's used to track an account that's changing over time. Let's bring in a picture of an asset schedule. What we have below are two corkscrew formations. We have the first corkscrew on top, which is being used to track the accounting bases, or the property, plant, and equipment. The second corkscrew on the bottom is being used as a label to track the tax basis. A really easy way to spot a corkscrew in a financial model is to look at this value right here, which sticks out to the side like the one below. Essentially, we always need an ending balance here for the P&E or an ending balance here for the tax basis in order to start the corkscrew. The reason that these are called corkscrews is that they follow a corkscrew pattern from left to right. Essentially, this ending amount for PP and E goes up to the beginning of the next year. We then add CapEx, subtract accounting depreciation, and are left with the ending balance for the PPP. That progresses forward into the beginning balance of the next period, and so on all the way through the model from left to right. We

also have a corkscrew below for the tax basis. It works in a similar fashion. We start with an ending. It flows up to the beginning of the next period. We add CapEx, subtract tax depreciation in this case, and then we get an ending tax basis. It continues to flow from left to right through the model. Tracking the asset values for the US over time. We're going to get to see exactly how these corkscrews work in a moment when we dive into the financial model and complete the asset schedule. One of the things that we want to keep in mind is that corkscrews are quite common in financial models. And in fact, anytime we're trying to track the value of anything over time, it might make sense. To throw it into a corkscrew and use that formation to keep track of that particular balance. Let's dive in and get started.

3. Research Methodology

As you would recall, we always have three sections to the schedules that we build up. The first section is where we're going to enter information, and there's a bunch of information we need. We need the capital expenditure, the blended tax depreciation rate for the company, and also the first-year tax depreciation. The other thing that we're going to need to enter in this case is over here. We're going to need a starting point for the property, plant, and equipment, and the tax basis.

Notice how these cells stick out to the left. This can be a really, really easy way to locate corkscrews and a financial model effectively if you see a cell sticking out to the left like this. If it shows you an ending balance, it's likely a corkscrew formation or a corkscrew structure that's being used to track an account balance. There are really a couple of reasons why we've built this schedule. First of all, we're going to track the property, plant, and equipment.

And one of the reasons we might need that is that we might need to flow this down into a balance sheet. The other thing that we're going to be tracking really carefully is we're going to track the tax bases across here through these cells, which is going to allow us to calculate the company's tax depreciation in this life and also allow us to track on a forward basis the tax basis in this company over time. The other thing to take note of is the idea that it's always important to have detailed footnotes in our financial models. And one of the things that we've noted here is that this schedule assumes that there are no asset disposals. So effectively, we're assuming that over this forecast period, the company will not sell any of its assets. You might be pleasantly surprised with this schedule in that it's a lot easier than the last one we put together on depreciation.

Figure 1

Asset Schedule							
	2020A	2021A	2022F	2023F	2024F	2025F	2026F
Capital Expenditure	5,199	4,400	4,550	4,700	4,850	5,000	5,125
Blended Tax Depreciation Rate			15.0%	15.0%	15.0%	15.0%	15.0%
First Year Tax Depreciation	50%						

Property Plant & Equipment

Beginning	65,014	65,387	65,679	65,881	65,988
Capital Expenditure	4,550	4,700	4,850	5,000	5,125
Accounting Depreciation	(4,177)	(4,408)	(4,647)	(4,893)	(5,147)
Ending	65,014	65,387	65,679	65,881	65,988

Let's dive in, get started, and make sure that we have the formulas completed correctly for this asset schedule. One of the things that we're going to do is always start off our corkscrews with these ending balances, as we mentioned earlier. These little parts that stick out can be a really easy way to spot a corkscrew. This is where we're going to start. So if we start here with the property, plant, and equipment, we're going to take this ending balance and flow it up into the next period to the beginning balance. That's going to be easy. We put an = in here; go over. And link down and hit enter. Next up is the capital expenditure. It's going to be really straightforward. It's just a simple link up to this value right here, and we'll hit enter. One of the things that we like to do down at the end here is always use some functions. So in order to use a sum function for the ending balance, we needed to enter the accounting depreciation as a negative number. That's best practice. So we can always be consistent and have some functions across the bottom of our corkscrews at all times. It's also nice to have some functions at the bottom of a corkscrew, because we know that there's an easy shortcut we can use, and that's it. That is Alt Equals, which we've used a few times already. We hit Alt equals, and then we just hit enter super quick. In order to finish up this section, we can just copy things forward again.

3.1 Tax basis Modeling

Let's continue downward and make some relatively easy connections. First of all, the beginning balance. We know that we can just connect across and down to the ending balance and hit enter for the capital expenditure. That's a really simple link. We're just going to say that that's equal to the capital expenditure in this schedule right here. Before we build this next formula, let's think through how it needs to work. First of all, the tax basis at the beginning of the year was

roughly 39 million. We're adding some capex that will increase that tax basis. So we may be inclined to add these together and then multiply them by the 15% tax depreciation rate. But one thing to note is that we've built this financial model with the flexibility to adjust the first-year depreciation, and in this case, we have it set to 50%. So what this means is that we're only allowed to add in 50% of the capex in the first year to increase the tax basis. Let's move into this cell now and figure out how this formula is going to be put together. One other thing that we want to think about is that we want the value in this cell to be negative, just like for accounting depreciation. Above, and that's so that we can use a sum function when we get to the bottom of the corkscrew. So let's jump into this cell now and get started. So here's how the formula is going to work for tax depreciation: We're going to put in an = and then minus. Now we want to figure out the tax basis, so for the tax basis we have the beginning balance plus the capital expenditure, but we know that's only 50%. That capital expenditure is allowed to increase the tax basis in the first year. Now we're going to hit four just to lock that cell down. We can now close the bracket. We now effectively have what's called the adjusted tax basis. We're now going to multiply this by the blended Tax depreciation rate of 15%. Let's hit enter. Now that the formula is complete, the rest is simple. We're going to hit Alt equals here to put in a sum function. We can hit enter, and then we can select upwards using control shift up. And now we want to fast. Fill right, control shift R, and everything's complete. So we have all the formulas filled in, but what we're going to do next is move things around a little bit. We're going to play with a couple of these inputs here. We're also going to talk about and review the formula that we put in here to make sure that we have a really deep understanding of what's going on in this schedule. Again, it's not just about Completing the schedules and getting to the right number is really about making sure that we have a good understanding of what's happening and why we're tracking these different asset values.

Figure 2

Tax Basis	2021A	2022F	2023F	2024F	2025F	2026F
Beginning Capital		39,211	37,538	36,255	35,303	34,632
Expenditure		4,550	4,700	4,850	5,000	5,125
Tax Depreciation		(6,223)	(5,983)	(5,802)	(5,670)	(5,579)
Ending	39,211	37,538	36,255	35,303	34,632	34,178

This schedule assumes that there are no asset disposals. ⁽¹⁾

4.Data Analysis and Interpretation

Now that we've completed these assets, schedule We want to take the opportunity to look through the schedule and make sure that we understand some of the concepts that are represented here. Let's take a close look. One thing that might be interesting to look at is the difference between the top corkscrew for property, plant, and equipment and the bottom one for the tax basis. Sure, we can say that the starting points are different here, but apart from that, when we look at the corkscrews through these sections, there's really only one difference, and that difference is the accounting depreciation versus the tax depreciation. If you remember back to our discussion on the depreciation schedule or using a straight-line depreciation method here, essentially the accounting rules say that you need to depreciate the assets over their useful lives. What's happening down here for the tax depreciation is that we're using a different method. In fact, we're using a form of accelerated depreciation here. We're depreciating at a rate of 15% every year. What we know is that in most jurisdictions around the world, Most governments will allow companies some form of accelerated depreciation for tax purposes. As we're

going to discuss in the next section on income tax, governments often offer some form of accelerated depreciation for tax purposes to help companies defer some of their taxes. Into the future. This helps free up cash flow for companies. We will go into the details a little bit later in the next article, Part 3. But for now, the main takeaway is that, usually early in an asset's life, these tax depreciation numbers are higher than the accounting depreciation numbers. Again, this is because the governments are often offering some form of accelerated depreciation here for tax purposes.

5.Recommendation and Conclusion

The main takeaway from this discussion Is it because these tax depreciation numbers are higher that the tax basis is getting driven down quicker than the PPE balance? In fact, the whole reason that this value here is higher than the one below is because the one below the tax basis has been driven down over time by virtue of the fact that these tax depreciation numbers have been higher in recent years. In fact, here's an easy way to think about it:

Figure 3

Model Testing

Property Plant & Equipment

Beginning	80,000	80,373	80,665	80,867	80,974
Capital Expenditure	4,550	4,700	4,850	5,000	5,125
Accounting Depreciation	(4,177)	(4,408)	(4,647)	(4,893)	(5,147)
Ending	80,000	80,373	80,665	80,867	80,974

Tax Basis

	2021A	2022F	2023F	2024F	2025F	2026F
Beginning	80,000	72,209	65,725	60,352	55,925	52,277
Capital Expenditure	4,550	4,700	4,850	5,000	5,125	5,125
Tax Depreciation	(12,341)	(11,184)	(10,222)	(9,428)	(8,773)	(8,773)
Ending	80,000	72,209	65,725	60,352	55,925	52,277

Let's suppose that on the very last day of 2021, the company bought a large piece of equipment for \$80 million. Let's say 80 million. Into here and also. Into here. At this moment in time, everybody agrees. In fact, if we look up here, the accounting measure of value is actually equal to the government's measure of value. They both agree since the equipment was just purchased. But now, as we look forward into the future, we can see that the accounting measure value of the property, plant, and equipment is fairly stable, but the tax basis is getting driven down over time by virtue of the fact that there's higher tax depreciation from the accelerated depreciation. So this is one of the main reasons why the property, plant, and equipment and the tax basis get driven down to different values. In fact, it's often the case, especially early in the asset's life, when the tax basis will end up having a lower value than the PP and E.

And after the discussion that we just had, it makes sense that the PP and E are higher than the tax basis again because of the accelerated depreciation. For tax purposes has driven tax bases down over time. There's one more thing that we should probably discuss before moving ahead. We want to go into this cell and highlight all the precedents. Let's pop in there. Do that. You might be curious how we did that. Let's turn it off and do it again. We're going to tap the Alt key. We want to go up next into the formula section of the menu, so we're going to hit M. This brings up the next part of the ribbon. Now what we want to do is trace precedents. So we're going to tap the letter P. Effectively, this is a formula auditing tool, as you will see up here in the Excel portion of the ribbon. It shows

us where all the precedent cells are, which is really handy. We could go up here and remove arrows if we wished, so we would talk Alt M, then A, and again another A to remove the arrows.

The reason that we're so focused on these precedents is because this tax depreciation and the rules for it are set by governments. That means that the governments are going to dictate how much depreciation is allowed in the first year, and they're also going to tell us what the depreciation rate is. That's allowed for tax purposes. The reason that we're bringing this up is because some of these numbers, and in fact, even some of the terminology, may change from one jurisdiction to the next. But the one thing that often remains constant is the idea that governments often allow some form of accelerated depreciation for tax purposes.

References:

Financial modeling and valuation analysis, 2020. Operational modeling, Corporate finance institute Canada.

Artigas, J., Tsay, R., 2003. Effective estimation of stochastic diffusion models with leverage effects and jumps. Working paper. Graduate School of Business, University of Chicago.

Artzner, P., Delbaen, F., 1999. Coherent measures of risk. *Mathematical Finance*, 203-28.

Balkema, A., Laurens, D., 1974. Residual life time at great age. *Annals of Probability* 2, 792-804.