

Scenic Video Transcript

Financial Leverage

Topics

- Intel Corporation's balance sheet analysis:
 - Financial leverage formula
 - Financial leverage consequences
 - Missing or mis-measured items
- Take-aways

Transcript

Introduction

During the period of 2007 through 2010, the *Wall Street Journal*, *Financial Times*, and virtually all other media outlets leading stories started with the concept of financial leverage. And there was almost universal agreement; the financial leverage is what tanked the economy during this period.

In this video, we're going to look at this concept in more detail than we did earlier in the chapter. And in particular, we're going to look at the consequences of financial leverage and then we're going to show how financial leverage measures, based on balance sheet numbers are distorted when there are numbers missing from the balance sheets or mismeasured, and then we'll finish with some takeaways.

Financial Leverage Formula

We begin by looking at Intel's balance sheet at the end of 2009. We notice that the assets are around \$53 B, the liability is around \$11.4 B, and the owners' equity around \$41.7 B. You might recall these primary elements are all we need to know to calculate the financial leverage.

Intel's financial leverage at the end of 2009, measured as liabilities over assets, is 21%. By itself, this number doesn't provide much information. It has to be compared to other financial leverage measures either for Intel over time or for competitors. So let's do that. Here we look at Intel over time. We see the 20.1% for the end of 2009. We see actually their leverage dropped slightly from 22% and 23% the two prior years. That said, it's relatively stable.

Now, let's compare that to Intel's biggest competitor, Advanced Micro Devices (AMD). AMD's leverage was 74% at the end of 2007. That meant that for every \$100 worth of assets, \$74 worth were financed with liabilities. And then it increased to a whopping 98% by the end of 2008, meaning that there were only \$2 worth of equity for every \$100 worth of assets and then declined again to 93%. So based solely on these numbers, we would conclude that



AMD is leveraged significantly higher than Intel. But what are the consequences of this leverage? That's what we turn to next.

Leverage Consequences

The consequences of financial leverage depend on two factors, the leverage ratio itself, which we analyzed on the prior slide and the asset risks and expected returns. Now, these consequences are often overlooked so want to make sure you understand them clearly and in particular, the importance of asset risk.

Let's look at a very simple example. Suppose we started a company with a balance sheet that looks something like this. We have \$100 worth of assets, we're expecting the future benefits to be worth \$100 and the financing of that is \$10 worth of liabilities and \$90 worth of equity. So this is a firm that has only 10% leverage, when measured as liabilities over assets.

So let's look one year into the future at what happens if everything turns out really great. Well, if everything turns out great, we'll assume the assets are going to be worth \$125 a year later, that's called the upside. And we have a \$25 gain in this case, the asset is going from a value of \$100 to \$125 or we say we have a reward of \$25.

Now, how is that going to get distributed among the claimants? Well, the liabilities claim is fixed no matter what happens to the assets so they're going to get \$10 and the owners are going to get \$115, and that means the owners are going to make \$25 which is really good. They're going to make \$25 on their investment. Now here, we're assuming that interest has already been paid to the debt holders before we get to the end of the year, so they're going to get just their \$10 principal back. They've already got their interest. Now what about the owners? How much are they going to get? Well, the owners are going to get \$25 back and so that's \$25 on a \$90 investment and that's $25/90$ as a return on their investment and that turns out to be about 28%. So they have a very positive return of 28%.

What happens on the downside? Well, what happens if the risk is realized that's implicit in the uncertainty here? Well, we're going to lose \$25 and the assets are only going to be worth \$75. Now, the debt holders are still going to get paid \$10 because they have a fixed claim. And so what happens to the owners? Well, they only get \$65 on their \$90 investment; they lost \$25 on a \$90 investment. So in this case, their return is -28%.

So on the upside, we say that the company gets rewarded, on the downside, the risk is realized and we talk about the tradeoff between risk and rewards. These are talked about in much more detail in a subsequent video, part of this same module.

Now, to show what happens when we increase the leverage, we're going to maintain the same upside and the same downside, but we're going to change the capital structure and change the leverage. So assets you go liability plus owners' equity, but in this case, we're going to have \$100 worth of assets still, but now we're going to finance them differently with \$75 of debt and only \$25 worth of equity. You've decided I'm not going to put \$90 in my company, I'm going to put \$25 in and I'm going to use somebody else's money and see what happens. Now, remember, we're going to maintain the same upside and downside so the asset risk and the asset reward are exactly the same. And what we're going to do is we're going to demonstrate that by increasing the leverage, we're actually going to amplify the upside and amplify the downside for our owners over here.

Now, again if we get \$125 as the return on the upside then the liability claimants are going to get \$75 and again assuming their interests has already been paid, and what's going to be left for the owners is \$50. But the owners put in \$25 so they're going to make \$25, which is exactly what they made up here, but there's a big difference. Down here, they only invested \$25 of their own money so now what is the return? Well, the return is going to be 100%. That's a great return in one year.

What about on the downside? Well, on the downside, they're only going to get \$75. All of that is now going to go to the liability claimants and what's going to be left for the owners is zero so they're going to lose \$25. So on the upside, they have 100% return, on the downside, they have a negative 100% return, they actually lose all their money. In this case, what we see is that by increasing the leverage, which is from up here to down here, by increasing the leverage but maintaining the same upside and the same downside for the assets, what happens is that the owners go from having smaller returns on the upside to bigger returns on the upside and smaller losses on the downside to bigger losses on the downside. And that's what we mean when we say that leverage accentuates risks and rewards. It accentuates the upside, it makes it bigger and it accentuates the downside, it makes it bigger holding fixed the asset risk and rewards.

We can begin to see the consequences of financial leverage. It does depend on the formula; it depends on how much leverage we have. So if we look at the formula here, it was 10%, down here it was 75%. But if we were to add more upside, make it even larger and the downside even bigger... So if we were to accentuate those but hold fixed the leverage in this case, we'd end up with the same story. So the amount of asset risks and rewards and the overall leverage formula, both of those contribute to the consequences.

So let's look up here at what we've got. That's exactly what we're saying here. If you want to look at the consequences of leverage, there's two factors you have to look at and this is really important. Because often, people focus on one, the ratio and they forget about the asset risks and the expected returns and rewards that go with those assets, and both of those are really important.

If you look at Bear Stearns, which was one of the first casualties of the financial crisis. Bear Stearns had a financial leverage ratio of 98% on its last balance sheet before March of 2008. So 98%. That looked very much like AMD for example. If we looked at their balance sheet equation, it was \$2 here, \$98, and \$100 here. So they had really, really, really high financial leverage. All of that was well and fine if the assets weren't risky. And in fact, they were assuming and they were betting that the assets weren't risky. Because the assets they were holding is what's called mortgage backed securities and historically those assets were a little bit risky. They just moved up and down a little bit over time and that's what Bear Stearns was expecting. In fact, that's what the entire economy was expecting.

What happened to Bear Stearns is that the asset risk turned out to be much larger than people thought. So when the assets dropped down in value, there simply wasn't even enough to cover the liabilities, let alone the owners' equity and the company crashed. That happened more generally for many companies across the economy and actually many governments were threatened by the same types of risks a couple of years later as debt began to move from the company balance sheets to the country balance sheets as the countries began to try to bail out their companies.

So that's what happened in the financial crisis and the really big lesson here is folks often talk about the financial leverage ratio. So they'll give you these numbers up here and these numbers up here don't mean much by themselves in terms of calculating the consequences unless you know about the asset risk. And so if you look at Intel for example, it's in a pretty risky business and so that's why we tend to see low leverage for companies that are high tech companies because their assets are very risky.

Missing or Mis-measured Items

Now, let's look at what can happen to the measures of financial leverage that is just the ratios if we leave off items or we mismeasure items. To do this, we're going to look at a simple example with Intel. If we look at Intel, we see that the book value of its owners' equity is \$41.7 B at the end of 2009. Yet, the market value of its equity, which we can get by taking its share price which is around \$20 a share x 5.5 B shares they had turned out to be \$112 B.

If we look at Intel's balance sheet, we get some pretty interesting analysis. Now let's start with their balance sheet as reported and we'll call that the balance sheet at book value. So BV means book value, what are they reporting on the books. And they had assets equal to liability, book value, plus owners' equity book value. And just to rough this out, we saw that their assets were worth around \$53 B just roughly and their liabilities were around \$11 B and their owners' equity was around \$42 B.

If we look at the comparable equation based on market values what do we get? Assets or market value equal liability at market values plus owners' equity at market value. Now we're going to assume the market value as measured by the stockholders is pretty accurate and so we'll put in here \$112 B. Now, we have to make an assumption about the liabilities, how close do we think the liabilities market value is to the book value. Now, we're going to do something here you certainly don't want to do for every company, we're going to assume that Intel's liabilities are relatively small and in fact there aren't any liabilities missing on the balance sheet, they're all there and they're measured pretty accurately. So we're going to put \$11 B there as a first approximation. That would be real dangerous with some companies, but in fact we know that's fairly safe with Intel because most of their liabilities are on balance sheet and they're measured fairly accurately. It could be off a little bit, but not enough to affect our analysis here. By contrast as we'll see, that could be dramatically off for some companies.

We now know the assets are probably worth somewhere in the neighborhood of say \$122 B. What we see therefore is that the market value of the assets is dramatically different than the book value. So we were calculating the leverage ratios to be around 21% based on the book value, but what about the financial leverage if we look at the market values? Well, we see it's much, much less. We have \$11 worth of liability still, but instead of having \$53 worth of assets, we have \$122 worth of assets. So leverage is going to be much smaller, more in the neighborhood of 10% if not less, but at least about half.

So what's going on here and how does that affect our analysis? Well the answer is it depends. So let's look at it and think through it. Well, the leverage ratio went down, but we put more assets on the balance sheet. What about those assets we put on the balance sheet, were they riskier assets or not riskier assets? That is, had we left off some assets that were more risky or less risky? Because that can affect the way we think about Intel. Well those assets turned out to be what's generally called internally developed IP, or intellectual property.

For example, you're probably familiar with Intel's chips, they're microprocessor chips, since they're in most computers. What you might not know is that the patent on those chips is not recognized as an asset on Intel's balance sheet yet in fact when the market looks and values Intel, it surely has to take into account the value that's embedded in those assets. What that means is that one of the most important assets for Intel is missing from the balance sheet. But now let's think about how risky that asset is. What are all the risks around that patent? Well, that asset is rather risky. It doesn't mean it won't pay off, but it is rather risky. So for example if a competitor came out with a new chip or even Intel came out with a new chip, well that could affect the value of that patent.

So when we're thinking about the consequences of financial leverage, you have to think about the assets that are off balance sheet as well as the liabilities that are off balance sheet. In this case, there were no liabilities off balance sheet and yet even though the ratio went down, you'd have to be very cautious about assuming the consequences change because perhaps there were assets that were off the balance sheet that we've now put on down here that are even more risky. Again, this gives you an idea of how to proceed with the analysis.

Just one more step on this off balance sheet stuff. Here what we discovered is we had assets equal liabilities plus owners' equity at book value. We could keep fixed the liabilities. What happens often is that when things are missing on both sides of the balance sheet, we leave assets off and not equity, but we leave liabilities off. In this case, the ratio goes way up and so can the asset risk go way up. That's a totally different analysis. It's got to be looked at in context and there will be numerous situations throughout Navigating Accounting where we look at off balance sheet assets and liabilities, rethink the financial leverage, and rethink the asset risk now that we've put more assets on the balance sheet.

Take-aways

So what should you know by now? Well, you should know that financial leverage reflects the extent to which assets are financed by liabilities rather than equity. It's measured as liability over assets or by comparable ratios involving assets, liabilities, and owners' equity. For Intel, we went over this analysis and we saw Intel has a very healthy financial leverage ratio and much better than its competitor AMD. And then we said well yeah, but you've got to be careful about how you draw inferences about this because you also have to consider the asset risk when looking at the overall consequences of financial leverage. In fact, Intel's assets are pretty risky and we've seen that in other modules in this chapter as we've looked at the individual line items and began to think about just how challenging Intel's business is and how carefully they've managed that risk over time.

One of the things we know is that financial leverage amplifies the owners' share of the risks and rewards associated with a company's assets. Analyzing the consequences of financial leverage ratios without analyzing asset risk is a recipe for disaster. We're not exaggerating here. In our assessment, that's exactly what happened in the economy. People saw that the financial leverage ratios were going up in the economy between 2004, 2005, 2006, but they completely forgot to take account of the asset risk and underestimated this risk.

Now the financial leverage ratios often differ greatly across industries because of difference in an asset risk. So in high tech companies for example, we generally see very low financial leverage. Analyzing the consequences of financial leverage can be problematic when assets or liabilities are not recognized on the balance sheet or objective experts' estimates of the

value of these assets and liabilities are widely dispersed. So there's a lot of uncertainty about just how we measure the assets that are on the balance sheet.

So where are we heading with all of this? Well the scenic route on asset, risks, and expected returns in this module discuss concepts that can help you better analyze situations where assessing risks and expected returns is important. You want to look at it if you have the time. The nature and magnitude of these risks can vary significantly across business contexts and these differences must be understood to assess the usefulness of the related measures. Because whereas risks are not the same as dispersion of measures, they are closely related. Again, that point is made in a subsequent video. We will begin to explore these differences in this module and analyze them in more depth in later chapters.

Well, I hope you've enjoyed this video. It's extremely important to understand the concept of financial leverage. See you in later videos.