UNIVERSITY OF OXFORD

Saïd Business School

MODULE 3 UNIT 1
Video 1 Transcript

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NIR VULKAN: Hi, everyone, and welcome to Module 3, where things are going to get a little bit more technical, but I think very exciting. And hopefully you will like it too. This is where we start looking at indicators and sort of look under the bonnet at what systems look like. The most important—and in fact, if there's one thing you remember the end of this programme, please let this be it. Statistical verification in and out of sample, most important thing in what we do here.

Let me be clear. The assumption here is that what happened in the past will happen again, right? That's the basis. So, we train our systems on the past and somehow then, these system can make predictions about the future. And the only way to test whether that works is what we call statistical verification, meaning optimise the model and then have a bunch of data that's unseen, so it's like the future, and to see that the model performance on that unseen data is roughly the same as it was on the in sample, on the data you trained it on. And if it doesn't work, the model is invalid. And I will say that so many times, you will be sick of it by the end of the programme. But this is where 99% of the problems occur.

People have very sophisticated models that overfit the past, and then they don't particularly good in predicting the future. It's very, very easy to predict the past, okay. The temptation to use more and more and more sophisticated models because the computers are powerful now and you guys are powerful and you've learned all this stuff from, you know, whatever, physics and so on. But the problem of this very, very sophisticated model is that it learns to fit the past really well, and then it's really not a model. It's a description of what has happened in the past.

One of the things I've learned very quickly when I started is that models that are likely to work in future are relatively simple. And I think it is because of what I just said now. It's this idea of statistical verification. So, if a simple model can explain the past, it's more likely to also have some useful insights into the future. If a really, really complicated model can explain the past, it's because it overfitted the past and it wouldn't necessarily do well in the future.

I'm going to keep saying this and other speakers are going to keep saying it because it is important. And when I say it's important, maybe some of you are thinking, "Okay, I got it. You can move on." But here's the thing. You have an idea, and you get some programmers, and you get some data, and you spend months building this stuff, and then it's time to run it out of sample, and then it doesn't work out of sample. What do you do then?

And the problem is that your gut reaction would be to say, "Oh, let me try it because of this. If I just twist this, or if I turn around this, let me do it again." And you redo it and then run it again. When you keep doing this with the same model – you twisting, twisting things around until it works, but it worked not because you twisted things around. It worked because if you are trying something random, a hundred times, it would work once or twice because it's random, not because what you found is useful.

So, the temptation will be there for you. I have to tell you I've been there. I've built systems that I really loved. I thought, "That's the one! That's the one! I'm buying a boat now!" You know, that's the one that's going to make it; everything looks great. And then it sort of collapses out of sample and you think, "It couldn't be. There's something wrong with the out of sample. Yeah, that's what it is. There's something wrong." You can start rationalising it to yourself in a way. And then that temptation is you actually going to go to market with something that's not valid.

But obviously there's a lot more in this module. Also, we would look at how you measure the performance of these models. And we look at some technical terms. In particular, the Sharpe ratio. So, William Sharpe, who's a statistician who won the Nobel Prize in economics a long time ago, had the simple idea of how to measure performance of system that have returns, but also have risks.

In other words, you could have two systems that made 40% last year. But one of them, you know, the returns have been like that [indicates a general upward trend], and the other one that returns have been like that [indicates a largely fluctuating movement with many highs and lows]. And clearly, they're not the same. One of them is a lot riskier. And the idea of the Sharpe ratio is that it compensate for that. So, it's roughly the returns divided by the deviation. And that's really important, and that's the correct way of looking at things.

Now I've sat in many committees where people forget that and they just look at absolute returns and it is important to look at absolute returns, but it also is very important to look at the risk associated with that. And actually, in fact, if you don't do that, you're not really comparing likes with likes. So, you go with a firm that has really high returns, but really, they're, what's the expression? Cowboys, yes? They're just taking huge risk and they were lucky. So, you know, they might not be lucky next year, whereas someone who has had good returns, but a decent Sharpe ratio as well, meaning it's actually good in terms of the risks that they have been taking.

So, we would look at the Sharpe ratio. We would look at some other measures. There's something called a Sortino ratio, the returns to drawdown. We will go through all of these things. And I think it is important that you go through these things, whether you have technical background or not, because that's actually useful thing in finance in general, thinking about systems, whether it's yours or others, how to compare them. You will see that all these different measures, Sortino, Sharpe, returns to drawdown, they're different, but they kind of are correlated. So, to some extent, it's not that important, which one you use as long as you use one of them, as that's the key differences between that and just the absolute returns.

So, this is the first module where we have the additional assignment. This is the programming, the IDE stuff. So, for those of you who know Python and are ready to get their hands a little bit more dirty, please have a go at doing that. Good luck with Module 3, getting a little bit more technical. I hope that you will enjoy it, and that you remember statistical verification out of sample. Doesn't hold out of sample, it doesn't work. Enjoy.

If you would like to review any of these sections, please click on the relevant button.