

11

Mon, 11/22 4:11PM 8:41

SUMMARY KEYWORDS

fund, wealth, esg, equal, invested, assets, denominator, quarter, fraction, approved, fifths, multiply, answer, break, divided, problem, social, smallest, scribble, factors

SPEAKERS

Robert McKeown

Let's take a look at a word problem. It has applications to finance, business and social sciences. And it's really asking you to find a fraction of a fraction. So let's walk through the question together, have your mind on, think about what you're looking at. And I always like to have a piece of paper, a pen ready so I can scribble and make notes and think about what I'm seeing as I go. So here's our problem, we're investing one quarter of our wealth and fund A, and the rest of our money is going to go in fund B. And with fund A $\frac{1}{3}$ of all the assets in there are environmental, social, and governance approved assets. So they have this nice impact for society. The remaining wealth is in fund B, which contains three fifths ESG approved assets. And the question wants us to answer how much of our wealth is invested in these ESG approved assets. We could draw a little diagram to help us because we've got all of our wealth at the top of the pyramid. And one quarter of that is in fund A and Fund A is $\frac{1}{3}$ ESG. The rest of our funds, I'll leave that as a question mark for now is in fund B, and fund B is three fifths ESG.

To answer this question, we need to know the weight or how much wealth is invested in fund B more specifically, what fraction of your wealth is invested in fund B. The weight on fund B is going to be equal to, well you know that you've got between fund A and fund B is 100% of your invested wealth. Because the remaining amount that you had was invested in B. So 100% is just equal to one. So we're gonna have one minus one over four, which is equal to four over four minus one over four, which is equal to three over four. This question mark up here is going to be equal to three over four. So if you have, if you've got a bunch of wealth invested in funds A and B, and one quarter is invested in fund A, then you must have three quarters invested in fund B. Now how much assets, how much ESG approved assets do you have?

Well, we're gonna have one quarter, that's our quarter there, times $\frac{1}{3}$. Plus, we've got the three quarters times the three fifths. Now all we have to do is calculate this expression that we've written right here to get to the answer. And if we start on that we get one quarter multiplied by $\frac{1}{3}$. That's just going to be one over 12. One times one divided by four times three, plus, we've got nine over 20. Now the question's asking us for a fraction. So let's keep this in fractions. So if we want to add these together, we need we need a common denominator. And I'll break it down into parts for you. You can see that 12 has a factor of two, three, and four and six. So if I break that down into the smallest

factor, it would be two times two times three into its smallest factors. And we don't need to worry about the denominator. 20, I could break 20 down into two times two times five. That would be the smallest factors in 20. And you can see if I want these two things to be the same, I just need to multiply this one by five, and this one by three.

Now let me start this off, we want to multiply this expression here by five over five, right, five over five is just equal to one. So I'm not changing the answer, when I do that, and we get one multiplied by five divided by two is two times three, times five, plus nine, times three, over two, times two, times three, times five, and we see that the denominators are the same. I can write this more clearly as five, plus nine times three is 27, divided by 60, which is going to be equal to 32 over 60. So I can simplify that further, which I'll do right now. And again, I'm going to show you this technique where I take the numbers and I break them into their smallest factors possible. So 32 over 60, could be rewritten as two times 16. And in the denominator, maybe I would have six times 10. Like that. And looking at the the numerator first, 16 is equal to two times two times two times two. And if I write them all out, I get a whole lot, I get five twos to the power of five, and down here and the denominator, six can be broken into two times three. And 10 can be broken into two times five. And I can just knock these out. And now I'm going to end up with two times two times two, so that's eight divided by 15. So the answer is eight over 15. Eight over 15 is the answer how do we explain what this answer means? Well, by investing one quarter of your wealth in fund A and three quarters in fund B, you have eight over 15, just a little bit more than 50% of your assets and ESG approved assets. Very socially conscious of you