1.4.3.5. Schedule 13D

Large changes in the underlying ownership of a company are considered very relevant information to most investors. Schedule 13D is filed with the SEC when any investor acquires more than 5% ownership in a publicly traded company. A 13D filing can signal a possible takeover.

1.4.3.6. Form 144

Form 144 must be filed in most instances when an insider sells more than 5,000 shares (or $50,000 worth of stock). An **insider** is someone who is an officer, director, or someone who owns more than 10% of the company. Naturally, when an insider is selling his shares, other investors might want to pay closer attention and may want to follow suit.

1.4.4. ACCOUNTING FUNDAMENTALS

Companies that file reports with the SEC must include financial statements that have been audited by an independent certified public accountant. The accountant examines the financial statements and writes a report with an opinion as to whether the financial statements were presented fairly and comply with Generally Accepted Accounting Principles (GAAP). The purpose of the audit is to provide assurance to the public (and especially current and potential shareholders) that the financial statements can be relied upon. Companies' annual financial statements, included in their 10-Ks, must be audited. Companies' quarterly financial statements, filed within their 10-Q, do not need to be audited.

The SEC requires publicly traded companies to adhere to GAAP standards so that a consistent set of rules is used for the presentation of financial statements. GAAP requires accrual accounting rather than cash accounting. Companies that use accrual accounting record transactions when they occur, rather than when payments are made. So a sale is recorded on the company's books when it occurs, rather than when the company receives payment for the sale. Expenses are also recorded at the time that they are incurred.

Cash accounting, in contrast, records transactions at the time the company receives payment. This is called cash accounting because transactions are recorded when inflows and outflows of cash occur. Cash accounting is used by smaller, privately held companies.

GAAP requires accrual accounting so that investors receive the most accurate current picture of sales and inventory. Under the accrual method, sales are recorded at the point of sale. This is the time that a product is removed from inventory even if payment does not occur for months.

1.4.5. QUANTITATIVE METHODS OF ANALYSIS

Knowing how to read a company's financial statements and how to use basic ratios to judge a company's financial health is an important tool for a financial analyst. But making investment decisions often involves deeper analysis. While the exam will not require you

to do any advanced number crunching, it does expect you to be able to identify and compare the results of some of the more complex financial calculations used in a process known as **quantitative analysis**, which focuses on analyzing the underlying financial fundamentals of a company. In particular, the exam may require you to be familiar with the time value of money and how to use descriptive statistics to analyze returns.

1.4.5.1. Time Value of Money

Though both situations are enviable, having a million dollars in the bank is not the same as someone promising to give you one million dollars a year from now. In fact, all else being equal, and depending on what a bank is paying in interest, having $950,000 in the bank today might actually be the same as having $1,000,000 one year from now. That's because if you invest it wisely, today's $950,000 is going to earn a bunch of interest and be worth roughly the same as the million dollars you're promised down the road. Likewise, if you had one million dollars now and let it sit there and earn interest for the next 12 months, it'd be worth substantially more than a million dollars a year from now.

The concept that equal amounts of money are not in fact equal if you do not have access to them at the same time is known as the **time value of money**. As the name implies, there is a *value* to the *timing* with which you have access to funds. In the process of analyzing potential companies or investments for your clients, recognizing how the time value of money affects a company's income statements and balance sheets is crucial. Being able to adjust your analysis for the fact that one company may not collect a large portion of the money it is owed for a year, while a different company can expect to collect its money in the next few months, will provide invaluable insight into which company may be a better overall choice.

1.4.5.1.1. Future Value

In terms of the exam, there are two primary time value of money concepts that you'll need to know, the simplest of which is known as **future value**. This is the concept that the value of funds in the future will be (or should be) more than it is today, based on the ability to earn at least a minimal amount of interest. How much today's funds will be worth in the future depends on the interest rate at which they will grow. Future value is one of the most basic premises in investing and underlies what everyone reading this book should hope to do for their clients: make what they have invested right now increase in value.

When you are analyzing different aspects of a company, determining future value can be extremely helpful. Since the value of a stock or bond issue in the future often depends on its issuing company's growth, making educated guesses about how that company's profits, expenses, and assets will grow over time can help you estimate a security's worth as an investment.

For example, let's say you're trying to decide whether to advise a client to invest in ABC Company. Based on the research you've done on the company's previous five years' income statements, you've come up with the following data, including the average increase in certain categories each year.

ABC COMPANY (FROM PREVIOUS YEARS' FINANCIAL FILINGS)		
Income	$10,000,000	Increases 2% annually, on average
Expenses	$4,000,000	Increases 5% annually, on average
Profit	$6,000,000	
Assets	$1,000,000	Increases 1% annually, on average
Debts	$1,000,000	Increases 3% annually, on average

Since your client is investing for a retirement that is 10 years in the future, determining where the figures above will be in 10 years will give you a clue as to whether you'd want to own that company as a long-term investment.

Adjusted for their estimated future values, ABC Company might be expected to show the following amounts in these categories:

ABC Company	Now	Future Value in 10 Years
Income	$10,000,000	$12,189,944
Expenses	$4,000,000	$6,515,579
Profit	$6,000,000	$5,674,365
Assets	$1,000,000	$1,104,622
Debts	$1,000,000	$1,343,916

While ABC Company looks pretty attractive based on its present information, with a $6,000,000 profit and about the same amount of assets as debt, the picture looks a little less rosy 10 years from now. Your projections show that ABC's sales will increase substantially; however, its expenses will grow even more quickly. This means that if your projections are accurate, ABC will experience a decrease in overall profits during this time period. Even more interesting is that 10 years from now, based on the expected growth rates of the company's assets and debts, ABC will have substantially more debt than assets. Using this type of future calculation can give you powerful insight on where a company may be headed.

1.4.5.1.1.1. *Calculating the Future Value (of a Present Sum)*

There are two ways to calculate the future value of something that you expect to increase in value at an average rate each year. There's a formula (which involves a calculator trick) and a rule of thumb, each of which you should know.

The actual *formula* for calculating the future value of a sum is:

$$\text{future value} = \text{principal} \times (1 + r)^{t}$$

In this formula, the "r" stands for the interest rate earned during the period, and the "t" stands for the number of periods over which you will be compounding (growing) the sum. So the formula can be rewritten:

$$\text{future value} = \text{principal} \times (1 + \text{interest rate})^{\text{number of periods}}$$

Aside from memorizing this formula, though, don't worry about being able to compute it by hand, since a basic calculator will be provided by the testing center.

On your basic exam calculator, you can determine the future value by using the following procedure. Start by converting the percentage into a decimal and then add it to 1.00. For example, 7% becomes 0.07, which becomes 1.07 when added to 1.00. Then you multiply your present sum by this value for each year in the period to get the future value.

So if you need to figure out what the future value of $5,000 would be in four years at 8%, you'd multiply:

$$\$5{,}000 \times 1.08 \times 1.08 \times 1.08 \times 1.08 = \$6{,}802.45$$

You can also use a rule of thumb, known commonly as the **Rule of 72**, to estimate how long it takes a present sum to double in future value, given a certain rate of return. While this will not tell you the exact future value of an item, it will help you to estimate and rule out possible answers to questions on the exam.

Under the Rule of 72, you divide the rate of return at which you expect something to grow each year into 72, and the answer is the number of years it will take that present value sum to double in future value. For example, if $10,000 was growing at a rate of 9%, you would divide 72 by 9 (the rate of return), giving you an answer of 8. This means at a 9% annual growth rate, $10,000 will become $20,000 in 8 years.

You can also flip this rule of thumb around to determine what rate of return an investment earned over a number of periods, if the future amount is roughly double the present amount. For example, if you know that a $5,000 investment grew to $10,000 in roughly 6 years, you could divide 72 by 6 (the number of years), which equals 12. This would tell you that the investment earned approximately 12% per year over the 6 years, doubling the original amount.

1.4.5.1.2. Present Value

The concept of **present value** is the reverse of the concept of future value. Instead of trying to figure out what something will be worth in the future, present value calculates what the value of a future amount is today. This comes in handy in planning for the future, since many times clients or companies will decide that they need a certain amount in the future to meet certain goals or financial commitments, which in turn brings up the question of how much they would have to set aside today (the present value) to reach those goals. Likewise, when you are looking at investments as potential choices for investing a client's money, being able to analyze the present value of future amounts will help you compare apples to apples (e.g., would you rather invest in a company that has $1 million of cash in the bank or one that will receive $2 million in cash from a government contract seven years from now).

Calculating the present value of something is not much different from calculating the future value of something, except that you use division instead of multiplication. The formula for calculating the present value of a single sum that is needed or that will be received in the future is:

$$\text{present value} = \frac{\text{future amount}}{(1 + r)^t}$$

As before, the "r" stands for the interest rate earned during the period and the "t" stands for the number of periods over which you'll be compounding (growing) the sum. So the formula can be rewritten:

$$\text{present value} = \frac{\text{future amount}}{(1 + \text{interest rate})^{\text{number of periods}}}$$

Calculating present value on a calculator is not any harder than calculating the future value of something, except you'll be using the division button instead of the multiplication button.

Here's how that would look for calculating the present value of $5,000 a client would need in four years, if their money could grow at a rate of 8%.

$$\$5{,}000 \div 1.08 \div 1.08 \div 1.08 \div 1.08 = \$3{,}675.15$$

Example: Kathy and Robert would like to have $100,000 saved up for their daughter's college education. She will be starting college in four years. Assuming a rate of 5% interest each year, how much should you tell them that they need to invest now? To find the amount, you would divide $100,000 by 1.05 four times ($100,000 ÷ 1.05 ÷ 1.05 ÷ 1.05 ÷ 1.05) for a total of $82,270.25.

1.4.5.1.3. Serial Payments

While it is unlikely that the exam will ask any difficult calculation questions about the time value of money and serial payments, you need to be familiar enough with this concept to answer conceptual questions on the topic. Thus far, you've learned about the computation of the present or future value of a single amount or lump sum. However, financial advisers and investors also need to calculate the present or future value of numerous fixed amounts that will be received in the future. This stream of payments is commonly referred to as **serial payments.** Investors receive serial payments on fixed-income securities such as bonds. Securities regulators want you to be familiar with two main concepts related to serial payments: net present value and internal rate of return.

1.4.5.1.4. Net Present Value (NPV)

Another time value of money concept that has to do with serial payments is **net present value**, or **NPV**. This calculation is a more complex version of the basic present value calculation mentioned earlier. Under a net present value calculation, the present value of each future cash inflow and outflow is calculated. Then the results are added to determine whether, in the present, the project has a positive value or negative value for a company or investor.

For example, if a company was going to invest $10,000 today, receive $4,000 each of the next three years, and then have to pay an additional $1,000 to exit the investment, an investor or company would want to know if the investment will result in a loss once the time value of money is considered.

Assuming an 8% annual interest rate, the calculation may look something like this, with the present values of money flowing out represented by negative numbers and money flowing in represented by positive numbers:

	Cash Flows	Present Value
Initial Investment	– $10,000	– $10,000
Year #1 Payment	+ $4,000	+ $3,704
Year #2 Payment	+ $4,000	+ $3,429
Year #3 Payment	+ $4,000	+ $3,175
Final Investment	– $1,000	– $794
Net Cash Flows	+ $1,000	
Net Present Value (NPV)		–$486

Though it appears the investment ultimately will make $1,000 in profit, when these amounts are adjusted for the fact that they will not be received until some point in the future and thus are worth less today than they will be when received, the project actually has a negative net present value. That would mean that this company might be better off avoiding this investment.

Note: If an adviser is asked to evaluate an investment or a company's project in terms of NPV, projects with the highest NPV should be chosen. If only one project or investment is being evaluated, it should only be taken on if the NPV is greater than zero.

1.4.5.1.5. Internal Rate of Return (IRR)

One of the biggest mistakes made both by investors and by the companies in which they invest is not comparing what they'll earn against what it costs them to earn it. This is especially true when you reflect on the idea of **opportunity cost**, which is the realization that using money one place means that you are not using it somewhere else. **Internal rate of return** is a method of calculating the average annualized yield of a series of cash flows associated with an investment. Once this rate is calculated, the investor or company can then compare it against other choices of how to use funds over the same period and decide whether or not to make the investment.

A simple example might be a company that wants to build a new plant now, which will cost $10,000,000 to build and is expected to yield $3,000,000 in new revenue each year for the next five years.

The IRR of a project is the rate at which the project has an NPV of zero. So if we were to examine the NPV equation for this project, we see:

$$NPV = -\$10 + 3/(1+r) + 3/(1+r)^2 + 3/(1+r)^3 + 3/(1+r)^4 + 3/(1+r)^5$$

The IRR is the rate at which the equation is equal to zero. It turns out that if we plugged this into an IRR calculator, the rate that results is 15.24%. This means the building of this factory represents a 15.24% internal rate of return on the company's investment. Not too bad. But if the company thinks it can earn 20% by investing its money in more advertising for its existing products or it is going to cost more than 15.24% to borrow the money needed to build the factory, then it may want to reconsider this investment. Note that the exam will not ask you to calculate the IRR, because you

won't be able to do it on the simple calculator that they will provide you with. Instead, you are expected to understand its general meaning.

The IRR is often used to value investments that have known future payments (also called cash flows), such as bonds or annuities. The IRR is rarely used to value stocks, because the future cash flows are not known and there is no fixed maturity date for a stock.

Note: To justify making an investment, an investment's internal rate of return needs to be higher than the internal rate of return on competing investments or the cost of borrowing money.

Example: ABC, Inc. is deciding whether to acquire XYZ, LLC, or to use the same funds to build a new factory of its own. ABC's management decides that projecting four years out is most appropriate to its situation.

The acquisition would cost $4 million. XYZ's estimated cash flows for the next four years are $1 million, $1.1 million, $1.3 million, and $1.5 million.

The new factory would also cost $4 million. The estimated cash flows the factory would produce for the next four years are $400,000, $800,000, $1.6 million, and $2.1 million.

The way you calculate IRR is by using the NPV formula above, setting NPV to zero and plugging in the cost and projected cash flow numbers for each investment. For the acquisition, this results in:

$$\$0 = \$1{,}000{,}000/(1+r)^1 + \$1{,}100{,}000/(1+r)^2 + \$1{,}300{,}000/(1+r)^3 + \$1{,}500{,}000/(1+r)^4 - \$4{,}000{,}000$$

With some assistance from a financial calculator, this equation gives r = 0.08. Therefore, the IRR of purchasing XYZ is 8%. For building the factory, the formula is:

$$\$0 = \$400{,}000/(1+r)^1 + \$800{,}000/(1+r)^2 + \$1{,}600{,}000/(1+r)^3 + \$2{,}100{,}000/(1+r)^4 - \$4{,}000{,}000$$

This equation gives r = 0.068. Therefore, the IRR of building the factory is 6.8%.

Even though the factory's cash flows are estimated to climb steeply, for the time period management has chosen, the acquisition of XYZ has a higher IRR. This suggests that ABC should proceed with the acquisition of XYZ.

1.5. RISK

No one single subject occupies the minds of most investors like the potential to gain or lose money. Understanding the risks that go along with each unique investment and explaining those risks clearly to clients is one of an adviser's core responsibilities. Unfortunately, there are no investments that come without risks, and no two investments share the same risks. To make matters slightly more complex, the exam will expect you to be able to identify some unique categories of risk.

At a most basic level, **risk** is the potential for an investor to lose part or all of her