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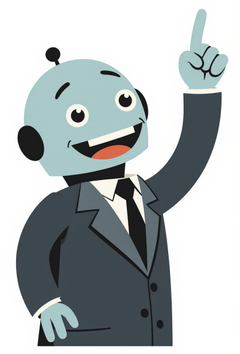

Compound interest is the process by which the interest earned on a principal amount also earns interest over time. This results in an accelerated growth of your investment, as any accrued interest is added to the initial principal, creating a snowball effect. Unlike simple interest, which only accumulates interest on the initial principal, compound interest generates interest on both the principal and any additional interest that has been earned. This 'interest on interest' phenomenon allows your investments to grow exponentially over time, making compound interest a powerful tool for building wealth in savings accounts, investment portfolios, or retirement funds. On the other hand, compound interest can also work against you if you borrow money, as it leads to larger payments over time due to the accumulating interest. Understanding this concept is crucial when deciding whether to save or invest your money. Compound protocol contracts utilize a system of exponential math, represented by Exponential.sol, to handle fractional quantities with precision.Most numbers in the Compound protocol are represented as a mantissa, an unsigned integer scaled by 1 * 10 ^ 18, allowing for high-precision basic math operations.Prices and exchange rates are scaled according to each asset's unique decimals; cTokens have 8 decimals, while their underlying tokens vary in decimal places.cToken Exchange Rate is calculated by the difference in decimals between the cToken and the underlying asset.oneCTokenInUnderlying = exchangeRateCurrent / (1 * 10 ^ (18 + underlyingDecimals - cTokenDecimals))Interest rates for each market update on any block where the ratio of borrowed assets to supplied assets changes.The amount interest rates are changed depends on the interest rate model smart contract implemented for the market and the change in the ratio of borrowed assets to supplied assets.Interest accrues to all suppliers and borrowers when an Ethereum address interacts with the market's cToken contract, calling one of these functions: mint, redeem, borrow, or repay.Successful execution triggers the accrueInterest method, adding interest to each supplier's and borrower's underlying balance.Interest compounds only during blocks where the cToken contract is invoked.Here is an example of supply interest accrual:Alice supplies 1 ETH to Compound. At the time of supply, the supplyRatePerBlock is 37893605 Wei, or 0.000000000037893605 ETH per block.No one interacts with the cEther contract for 3 Ethereum blocks.On the subsequent 4th block, Bob borrows some ETH.Alice’s underlying balance now is 1.000000000151574420 ETH (which is 37893605 Wei times 4 blocks, plus the original 1 ETH).Alice's underlying ETH balance in subsequent blocks will have interest accrued based on the new value of 1.000000000151574420 ETH instead of the initial 1 ETH.The Annual Percentage Yield (APY) for supplying or borrowing can be calculated using the value of supplyRatePerBlock (for supply APY) or borrowRatePerBlock (for borrow APY) in this formula:Rate = cToken.supplyRatePerBlock(); // Integer ETH Mantissa = 1 * 10 ^ 18 (ETH has 18 decimal places) Blocks Per Day = 7200 (12 seconds per block) APY = ((((Rate / ETH Mantissa * Blocks Per Day + 1) ^ Days Per Year)) - 1) * 100Here is an example of calculating the supply and borrow APY with Web3.js JavaScript:const ethMantissa = 1e18; const blocksPerDay = 7200; // 12 seconds per block const cToken = new web3.eth.Contract(cEthAbi, cEthAddress); const supplyRatePerBlock = await cToken.methods.supplyRatePerBlock().call(); const borrowRatePerBlock = await cToken.methods.borrowRatePerBlock().call(); const supplyApy = (((Math.pow((supplyRatePerBlock / ethMantissa * blocksPerDay) + 1, daysPerYear))) - 1) * 100; const borrowApy = (((Math.pow((borrowRatePerBlock / ethMantissa * blocksPerDay) + 1, daysPerYear))) - 1) * 100; console.log(`Supply APY for ETH ${supplyApy} %`); console.log(`Borrow APY for ETH ${borrowApy} %`)You can reduce your coffee expense to just SGD1 a day. This savings of SGD4 will translate into SGD120 a month and SGD1440 a year. If you put your savings into an investment that yields 4% per annum, this sum of money will accumulate to SGD80732 in 30 years! This "Latte effect" is an example of how compound interest can be a powerful wealth generator in the long run. Compound interest is when interest is credited not only to the principal but also to the interest already earned, thus growing your returns over time. It's unlike simple interest where only the principal earns interest. Starting with a small investment and letting it grow through compounding can lead to impressive results. For instance, if you invest SGD10000 at 5% returns p.a., after 1 year you'll have SGD10500, then SGD11025 after 2 years, and SGD11575.625 after 3 years. By the end of 10 years, your investment will grow by 62.9%. The longer you let it compound and the larger the principal sum, the more significant the growth. Compounding frequency also plays a crucial role in how interests accumulate. Compounding interest more frequently can lead to higher returns. For example, if SGD1000 earns 5% return p.a. for 10 years compounded annually, monthly, weekly, or daily will result in different total amounts at the end of that period. The same principal invested with a more frequent compounding frequency will yield higher earnings due to the snowball effect of interest on interest. Saving or investing early and letting time work its magic is key. This can be seen in how Adrian, Bernice, and Craig's investments grew over 40 years. Despite starting at different times, the earlier they invested and contributed regularly, the more their principal sums grew through compounding. The most disciplined investor, Craig, ended up with SGD871667, a staggering return on his initial capital of SGD200000. The Central Provident Fund (CPF) also utilizes compound interest to grow your savings over time. The interest rates for OA and SA are relatively attractive at 2.5% and 4.01%, respectively. Contributing to the principal regularly, even with small amounts like SGD50 a month into CPF, can significantly boost your interest earnings in the long term. By understanding and utilizing compound interest effectively, you can see impressive returns on your savings or investments over time. It's essential to start early, contribute regularly, and consider compounding frequency and contributing to the principal when planning for your financial goals.The magic of compounding is not limited to savings, but also works for investments. To take advantage of this, consider the following: Reinvesting dividends from stocks and bonds can help grow your investment base. On top of that, use dollar-cost averaging by setting aside a fixed amount each month via a Regular Savings Plan like the DBS Invest Saver to investing. Also, reinvest your bonuses from investment-linked policies and endowment plans. Some of us may be tempted to spend our dividends as a "reward", but reinvesting them will give us a greater reward in the long run. The key is to time it right, saving and investing now will pay off in the future and help you accumulate a sizeable nest egg or multiple income flows. Loading DataPlease wait a moment. Disclaimer: This page may contain affiliate links. CoinMarketCap may be compensated if you visit any affiliate links and you take certain actions such as signing up and transacting with these affiliate platforms. Please refer to Affiliate DisclosureCompound NewsCompound community See compound in the Oxford Advanced American DictionarySee compound in the Oxford Learner's Dictionary of Academic English Nearby words cautious adjective From the Word list Oxford 5000 C1 Oxford Learner's Dictionaries Word of the Day From Longman Dictionary of Contemporary English the village was built around a cluster of medieval buildings dating back to the 16th century