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How to calculate joint probability distribution table

The distribution margin is an accountancy term that describes the degree of profit or loss with respect to a good that is bought wholesale. The term is thus commonly used with commodities, such as oil or food. Such commodities tend to be sold in a supply-chain framework, with producers, distributors, middlemen and sellers. The distribution margin is especially useful in this case as it takes into account the cost of purchasing a good from the original producer or distributor. Obtain the data needed for your calculation. This will include costs, which may involves all taxes, including state sales tax, federal excise tax and any governmental fees and marketing costs. You will need the wholesale price of the good, as well as the average sales price for which you are selling the good on the market. The specific number of variables needed in your calculation will depend on the type of good and market, and thus the relevant taxes and costs may vary. Add up all taxes and compile them into a single quantity. If your taxes are in percentage terms, calculate the total tax paid and to be paid in dollar terms. Add the wholesale price of the good to this quantity. This will yield the total costs of your good. Subtract the total costs from the average sales price of the good to get the distribution margin. If the distribution margin is positive, the good is being sold at a profit. If the distribution margin takes a negative value, it is being sold at a loss. Similarly, if the distribution margin takes the value of zero, the good is being sold at a break-even price. Dennis Sabo/iStock/Getty Images By: Patrick Gleeson, Ph. D., Updated September 26, 2017 Default probability most often refers to the likelihood that a borrower will fail to repay a debt according to the terms of the loan contract. The underlying idea is that a certain performance is required according to an agreement with time constraints. The calculation quantifies the probability of the performing party failing to fulfill the contractual obligation. The default probability calculation is an important risk assessment tool, often performed by large financial institutions specializing in quantifying risk for wholesale lenders and quasi-governmental institutions, such as The International Monetary Fund. The actual calculation is not something an individual lending to another individual is likely to have the resources to execute. Fortunately, you do not need to perform the calculation yourself to benefit from the determination. A borrower's credit score is a well-known instance of a determination of default probability that you can access for either a relatively modest fee or at no cost, providing that the other party gives you permission to access the information. The process is outlined by Experian, one of three major credit-scoring agencies, in their online form "Register to Check Your Customer's Credit." Other firms provide more detailed default probability calculations at higher costs. If you imagined spending your retirement like Smaug the dragon, sitting atop a pile of gold (by which we mean retirement savings), think again. The IRS wants you to start taking money out of your retirement accounts beginning around age 70.5. This money goes by the name required minimum distributions (RMDs). Want to learn more? You're in the right place.Check out our retirement calculator.The following kinds of retirement accounts all come with required minimum distributions: SEP-IRAs SIMPLE IRAs Traditional IRAs 401(k)s 403(b)s 457(b)s Profit-sharing plans Other defined contribution plans For IRAs, SEP-IRAs and SIMPLE IRAs, the date for beginning required minimum distributions is April 1 of the year following the calendar year in which you turn 70.5. For 401(k)s, profit-sharing agreements, 403(b)s and other defined contribution plans, the beginning date for RMDs is usually April 1 after the later of either a) the year you turn 70.5 or b) the year you retire.Why Are There Required Minimum Distributions? You may be wondering why the IRS doesn't let you wait as long as you want to take distributions. Here's why: The above account types all offer tax-deferment. With these accounts you can make tax-deductible contributions and enjoy tax-deferred growth. From the time you first open, say, a traditional IRA, to the time you turn 70.5, the IRS is getting nothing out of your IRA savings.You didn't expect the Tax Man to defer your taxes indefinitely, did you? That's why the IRS imposes required minimum distributions. Without RMDs, people could use tax-deferred retirement accounts to stash their money indefinitely and never pay taxes on the funds. In exchange for letting you deduct your contributions to tax-deferred accounts, the IRS wants to make sure that it gets its share when you're in your golden years. Why Don't Roth IRAs Have RMDs? Because Roth IRAs (and Roth 401(k)s) are funded with after-tax dollars, the IRS has already gotten a cut. Roth accounts are great because you don't pay taxes on the money you take out of them in retirement, and you're not required to dip into them if you don't need to. Some strategic folks choose to diversify their tax burden in retirement by having a mix of Roth and non-Roth accounts. How Are Required Minimum Distributions Calculated?Great question. To calculate this year's RMD, take the account balance at the end of the previous calendar year and divide it by the distribution period you find on the IRS's Uniform Life Table. The "distribution period" is pretty much a nice way of saying, "the number of years you have left."Of course, because it's the IRS, there are exceptions that complicate things. If someone is the sole beneficiary of a deceased's retirement account, and that someone is the spouse of the deceased, and that spouse is 10+ years younger than the deceased, a separate life expectancy table is used to calculate RMDs. This is called the Joint Life and Last Survivor Expectancy Table. Other beneficiaries who need to calculate RMDs use the Single Life Table.Do Inherited Accounts Have RMDs? Yup. If you inherit one of the retirement accounts listed above (or even a Roth IRA), you will have to take RMDs. The rules on these distributions depend on whether you're the spouse of the deceased or another, non-spouse beneficiary.If you're the spouse and sole beneficiary of the retirement account, you have several options. You can treat the inherited retirement account as yours and roll it over into a retirement account of your own, base RMDs on your age, base RMDs on your late spouse's age at death and reduce the distribution period by 1 year annually or withdraw the entire amount by the end of the fifth year after retirement, provided your spouse died before the age at which he/she should have taken RMDs. If your spouse died before reaching the age for RMDs, you can wait until he or she would have reached age 70.5 to start taking distributions. The rules for beneficiaries who aren't spouses are different. If the account owner died before the beginning date for RMDs, you can pocket the entire account balance by the end of the fifth year after the account owner's death. Alternatively, you can calculate required minimum distributions based on the Single Life Expectancy Table.Bottom LineDo required minimum distributions sound too complicated? Are you considering taking your chances, skipping the RMDs and hoping the IRS doesn't notice? Not a good idea. If you skip distributions, or if you take distributions that are too small, you'll pay for it. To be specific, you will owe the IRS a 50% excise tax on the sum you should have taken in distributions. This applies to beneficiaries as well, so add "start taking RMDs" to the list of things you have to do when you inherit.If you're overwhelmed, consider talking to a finacial advisor. A matching tool like SmartAsset's SmartAdvisor can help you find a person to work with to meet your needs. First you'll answer a series of questions about your situation and goals. Then the program will narrow down your options from thousands of advisors to up to three registered investment advisors who suit your needs. You can then read their profiles to learn more about them, interview them on the phone or in person and choose who to work with in the future. This allows you to find a good fit while the program does much of the hard work for you.Photo credit: flickrPage 2Do you know enough about financial management to take care of all of your investing on your own? Or do you need help from a seasoned expert?That question comes up for millions of Americans each year.If any of these describe you, you could benefit from professional financial advice:1. You're retiring soon – Maximizing retirement income requires smart decisions around complex topics such as Social Security, 401(k) and IRA withdrawals.2. You manage your own investments – Individual investors should check their strategies with unbiased third parties. You may be overlooking opportunities in your portfolio.3. You have children – Whether you're saving for college or planning their inheritance, there are several ways to ensure your children are taken care of.4. You inherited money – Have you noticed lottery winners often declare bankruptcy? It can be difficult to manage sudden increases in wealth.5. You have a financial advisor – Depending on how you chose your advisor, there may be a better one for you. Family referrals are convenient but don't always produce results.6. You're divorcing – Untangling finances in a divorce can be messy. Impartial advice is key.7. You want to build wealth – If you're still decades from retirement, good decisions today can add thousands to your retirement accounts.See Your 3 Financial Advisor MatchesFinding the right financial advisor that fits your needs doesn't have to be hard. SmartAsset's free tool matches you with top fiduciary financial advisors in your area in 5 minutes. Each advisor has been vetted by SmartAsset and is legally bound to act in your best interests. If you're ready to be matched with local advisors that will help you achieve your financial goals, get started now. The Internal Revenue Code sections 72(t) and 72(q) allow for penalty free early withdrawals from retirement accounts. The IRS limits how much can be withdrawn by assuming any future earnings will be at most 120% of the Federal Mid-Term. This conservative approach can help assure that you will not prematurely deplete your retirement account. However, if you have a higher rate of return your account can actually grow, even with your distributions. On the other hand, if you suffer losses your account balance may end up shrinking faster than you might expect. This calculator is designed to examine the affects of 72(t)/(q) distributions on your retirement plan balance. The IRS requires that you withdraw at least a minimum amount - known as a Required Minimum Distribution - from your retirement accounts annually; starting the year you turn age 70-1/2. Determining how much you are required to withdraw is an important issue in retirement planning. Use this calculator to determine your Required Minimum Distributions. C.K. Taylor A table of z-scores can be used to calculate the areas under the bell curve. This is important in statistics because the areas represent probabilities. These probabilities have numerous applications throughout statistics. The probabilities are found by applying calculus to the mathematical formula of the bell curve. The probabilities are collected into a table. Different types of areas require different strategies. The following pages examine how to use a z-score table for all possible scenarios. C.K.Taylor To find the area to the left of a positive z-score, simply read this directly from the standard normal distribution table. For example, the area to the left of z = 1.02 is given in the table as .846. C.K.Taylor To find the area to the right of a positive z-score, begin by reading off the area in the standard normal distribution table. Since the total area under the bell curve is 1, we subtract the area from the table from 1. For example, the area to the left of z = 1.02 is given in the table as .846. Thus the area to the right of z = 1.02 is 1 - .846 = .154. C.K.Taylor By the symmetry of the bell curve, finding the area to the right of a negative z-score is equivalent to the area to the left of the corresponding positive z-score. For example, the area to the right of z = -1.02 is the same as the area to the left of z = 1.02. By use of the appropriate table we find that this area is 1.02 is given in the table as .846. C.K.Taylor To find the area to the right of a positive z-score, begin by reading off the area in the standard normal distribution table. Since the total area under the bell curve is 1, we subtract the area from the table from 1. For example, the area to the left of z = 1.02 is given in the table as .846. Thus the area to the right of z = 1.02 is 1 - .846 = .154. C.K.Taylor By the symmetry of the bell curve, finding the area to the right of a negative z-score is equivalent to the area to the left of the corresponding positive z-score. For example, the area to the right of z = -1.02 is the same as the area to the left of z = 1.02. By use of the appropriate table we find that this area is 1 - .846 = .154. C.K.Taylor To find the area between two positive z scores takes a couple of steps. First use the standard normal distribution table to look up the areas that go with the two z scores. Next subtract the smaller area from the larger area. For example, to find the area between z1 = .45 and z2 = 2.13, start with the standard normal table. The area associated with z1 = .45 is .674. The area associated with z2 = 2.13 is .983. The desired area is the difference of these two areas from the table: .983 - .674 = .309. C.K.Taylor To find the area between two negative z scores is, by symmetry of the bell curve, equivalent to finding the area between the corresponding positive z scores. Use the standard normal distribution table to look up the areas that go with the two corresponding positive z scores. Next, subtract the smaller area from the larger area. For example, finding the area between z1 = -2.13 and z2 = -.45, is the same as finding the area between z1* = .45 and z2* = 2.13. From the standard normal table we know that the area associated with z1* = .45 is .674. The area associated with z2* = 2.13 is .983. The desired area is the difference of these two areas from the table: .983 - .674 = .309. C.K.Taylor To find the area between a negative z-score and a positive z-score is perhaps the most difficult scenario to deal with due to how our z-score table is arranged. What we should think about is that this area is the same as subtracting the area to the left of the negative z score from the area to the left of the positive z-score. For example, the area between z1 = -2.13 and z2 = .45 is found by first calculating the area to the left of z1 = -2.13. This area is 1-.983 = .017. The area to the left of z2 = .45 is .674. So the desired area is .674 - .017 = .657.