

## **J.R. Huston Enterprises, Inc.**

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- None

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- None

### Key terms

- None

Misconceptions, faults and outright mathematical errors exist in the minds of many contractors when it comes to using margins and markups in their estimating systems. Common or conventional wisdom can get the contractor into serious trouble if he does not understand the limitations of both when used in the bidding process. However, when understood and used properly, margins and markups can provide the contractor with some very powerful tools. These tools can be used to not only analyze individual bids but they can also be used to analyze trends in the marketplace. Increased bidding accuracy, more thorough ratio and margin analysis, and increased bidding flexibility are but a few of the tools that can be provided by properly applied margins and markups.

### **Historical definitions**

The dictionary defines margins and markups almost identically as, “the difference (amount or percentage) between the cost and the selling price.” However, in common construction usage there is a slight variation when the two are applied to bidding jobs.

1. A markup is commonly used in a bidding situation as a factor in the form of a percent or decimal multiplied by a direct cost or combination of direct costs. For instance, all direct costs (materials, sales tax, direct labor and labor burden, equipment and subcontractors) might be

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increased by 25% to achieve the final selling price for a job. Mathematically it plays out as follows:

$$\$10,000 \text{ (total direct costs-TDC)} \times 1.25 \text{ (or 125\%)} = \$12,500$$

The markup applied to all direct costs is 25%. Conventional wisdom says that if you desire a 25% gross profit margin (GPM) for your business at the end of the year, mark up all of your direct bid costs by 25%.

2. A margin, on the other hand, is slightly different. To achieve a 25% margin, the mathematical formula differs slightly from that used for the markup. We divide the total costs by 1 minus the desired margin to achieve it. It plays out as follows:

$$\$10,000 \text{ (TDC)} / (1-.25) = \$10,000/.75 = \$13,333$$

Notice the difference in the final price for the two examples. Example 2 has actually achieved a 25% margin on top of all costs. If you divide the margin amount by the price, you get .25 or 25%.

$$\$3,333/13,333 = .25 \quad \text{or} \quad 25\%$$

However, if you divide the mark-up amount in example 1 by the price, you lose 5%.

$$\$2,500/12,500 = .2 \quad \text{or} \quad 20\%.$$

A 25% markup translates into a true 20% margin. Let's look at what happens when 10% is used as the markup and margin.

$$1. \$10,000 \text{ (TDC)} \times 1.1 \text{ (or 110\%)} = \$11,000$$

$$2. \$10,000 \text{ (TDC)} / (1-.1) = \$10,000/.9 = \$11,111$$

Which method achieved the true 10% margin?

Example 1 has a true margin of \$1,000 (the difference between TDC and price). However, this translates into .091 or 9.1%. Almost a whole percentage point was lost in the process.

Example 2 actually realized a true 10% margin. The \$1,111 difference between TDC and price divided by the price is .1 or 10%.

**So what's the big difference?**



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Or  $A \times B = C$

Factor A (material costs) multiplied by factor B (sales tax) equals the product C (sales tax dollars)

There is a direct mathematical correlation between factor A, factor B and the product C. It is important to note that this formula is mathematically accurate because it accurately calculates the costs involved. Markups and/or margins used in this manner in the bidding process are legitimate and accurate. Unfortunately, the use of markups and margins are often stretched beyond their ability to accurately calculate bid costs.

The erroneous use of markups and margins in the bidding process generally occurs in two areas. The first is in the recovery of indirect G&A overhead costs. The second involves achieving a desired GPM on the company profit and loss statement at the end of the year.

### Markups, margins and G&A overhead cost recovery

There are roughly four mark-up formulas used in the marketplace to recover indirect G&A overhead costs. Essentially, they all make the same erroneous mathematical assumption but each has its own unique twist and attempted justification. They get more complex as they progress.

1. **Materials times 2** (or 2.5 or 3.0...). Displayed mathematically the formula is  $M \times 2 = P$ . Or materials multiplied by a factor of 2 produces your desired price for the bid. The factor is supposed to cover your indirect G&A costs and net profit.
2. **The GPM method:** Total direct costs are increased by a percent or factor to cover indirect G&A overhead costs and net profit. The mathematical formula is as follows:

$$((\text{materials} + \text{tax}) + (\text{direct labor} + \text{labor burden}) + (\text{equipment costs}) + (\text{subcontractor costs})) \times (1 + \text{factor}) = \text{Price}$$

3. **The dual overhead recovery system (DORS):** Material costs are increased by a predetermined percent to recover indirect G&A overhead costs on materials. Direct labor costs are increased by another predetermined percent to recover indirect G&A costs on labor. Equipment costs, other than rental equipment, are usually included in the indirect G&A overhead mark-up percents. Sales tax and labor burden is usually calculated in the respective mark-up percents. Subcontractors are normally marked up independent of the other direct costs. Net profit may be included in the mark-up percents or it may be added at the end of the bid. The mathematical formula is as follows:

$$((\text{material costs} \times P1) + (\text{direct labor costs} \times P2)) = \text{Price}$$

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4. **The multiple overhead recovery system (MORS):** To recover indirect G&A overhead, material costs (with tax) are usually marked up 10%, equipment costs are marked up 25%, subcontractors costs are marked up 5% and direct labor (including labor burden) is marked up by a calculated percent usually ranging from 35 to 85%. Net profit margin is then added to the sum total of these four items. The mathematical formula is as follows:

$((\text{material costs} \times 1.1) + (\text{equipment costs} \times 1.25) + (\text{subcontractor costs} \times 1.05) + (\text{direct labor costs} \times 1 + 35 \text{ to } 85\%)) + \text{net profit} = \text{Price}$

### **Margins and the year-end financial statement**

Some accountants erroneously reason that to obtain a desired GPM (30% for example) at the end of the business year, a contractor should add a 30% gross profit margin on all of their jobs throughout the year. You could almost get away with this if every job that you bid had the exact same ratios of direct costs (materials, labor, equipment, subcontractors, etc.). However, 9 times out of 10 this is not the case for landscape construction or maintenance jobs. Without a detailed mathematical explanation, suffice it to say that there is no arithmetical correlation between the amount of GPM you desire to achieve on your business at the end of the business year and the amount of GPM you should add to individual jobs being bid. Contractors can get into serious financial trouble using this pricing method.

### **So what's the problem?**

Without getting into all of the detailed explanations and arithmetic as to why the above formulas have mathematical faults, there is one overriding faulty mathematical assumption contained in all four, which should be addressed.

Markups and margins accurately reflect bid costs when applied to calculating direct costs such as sales tax, FICA, FUTA, SUTA, etc. as noted previously. The mathematical formula of  $A \times B = C$  accurately calculates direct costs in such a situation. However, the four mark-up formulas noted attempt to go way beyond this. All of these four methods use factoring or a derivative thereof to calculate and recover indirect G&A overhead costs. Herein lies the problem in the arithmetic.

Factoring or multiplication, by necessity, creates a direct correlation between the factors and the product (or price in our examples). If a factor (2 or 3) is changed in the equation  $2 \times 3 = 6$ , the product (6) is directly impacted. If the 2 is changed to an 8, the product increases in direct proportion to the change. It increases fourfold because the original factor of 2 was quadrupled.

All of the prices produced by the four mark-up formulas are supposed to contain indirect G&A overhead costs. Unfortunately, indirect G&A overhead costs do not act like direct costs

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(materials, direct labor equipment costs, etc.). That is why they are referred to as “indirect” costs. There is no direct correlation between direct job costs and indirect G&A costs. Indirect G&A overhead costs do not increase or decrease in direct proportion to an increase or decrease in material, labor, equipment costs, etc. in a bid. Office rent, office salaries, telephone bills, advertising costs, etc. may increase or decrease as direct field costs fluctuate but not in direct mathematical proportion to them. Calculating and recovering indirect G&A overhead costs by using markups and margins in the bidding process, regardless of how complex the mathematical formula, assumes a direct mathematical relationship where there is none. These methods usually overstate or understate indirect G&A costs in most common bidding situations. Bid accuracy consequently goes out the window.

### **When to use markups and margins**

Markups are very useful and necessary for calculating costs within a bid such as sales tax, FICA, FUTA, SUTA, etc. They are normally applied in a very narrow and well-defined mathematical context. Margins, on the other hand, can be very useful as market analysis tools and are much wider in scope. The gross profit margin can be particularly beneficial if calculated on bids and monitored consistently.

For instance, around the country the GPM on a landscape residential installation job usually is 35% plus or minus 5%. In other words, the indirect G&A overhead plus the net profit margin on such a job will normally fall between 30 to 40% of the total price of the job. If your GPM's on jobs are lower, you should probably increase them. If they are higher, keep quiet. The GPM on commercial and residential maintenance work usually ranges from 25 to 35%. Commercial landscape installation work usually realizes a GPM of 25% plus or minus 5%.

Competitively bid jobs will usually see GPM's at the low end of the range while negotiated work should have GPM's at the mid to high end of the range. Negotiated work should be your most profitable work and it should be the least risky work that you do. High margins, low risk-you should attempt to negotiate as much work as possible.

GPM's usually plummet as the economy enters a recession. They tend to increase as economies heat up. This makes sense from a supply and demand curve perspective. A constant number of contractors chasing a decreasing amount of work drive prices down.

Surprisingly, margins have not increased that much in the last 3 years as the economy has improved. Landscape contractors in some of the hottest spots in the country are bidding jobs at gross profit margins below 20%. Part of the problem is the sheer number of contractors chasing the work. There are many more landscape contractors in the market today than there were 3 to 4 years ago.

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### **Conclusion**

Markups and margins are different as commonly used in the construction and service industry. Mathematical misconceptions ranging from simple quirks in arithmetic to faulty assumptions in complex indirect G&A overhead recovery cost formulas can cause the uninitiated estimator to overstate or understate important cost components in a bid. Accurate cost estimating is the real issue. Once properly understood and used, markups and margins can provide useful tools for the contractor to not only analyze individual bids, but they can also help analyze markets and market trends. These tools can not only help assure that today's jobs are bid accurately and competitively, they can help ensure that the contractor will be around to bid on tomorrow's jobs as well.

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This article was adapted from James Huston's new book and audio book, *How to Price Landscape & Irrigation Projects*, released in July 2003 and his previous book, *Estimating for Landscape & Irrigation Contractors*. The author is president of J.R. Huston Enterprises, Inc., which specializes in construction and services management consulting to the Green Industry. Mr. Huston is a member of the American Society of Professional Estimators and he is one of only two Certified Professional Landscape Estimators in the world. For further information on the products and services offered by J.R. Huston Enterprises, call 1-800-451-5588, e-mail JRHEI at [jrhei@jrhuston.biz](mailto:jrhei@jrhuston.biz) or visit the J.R. Huston Enterprise web site at <http://www.jrhuston.biz>.