

Sales Quota Accuracy and Forecasting

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PREVIEW *Sales-forecasting authority Mark Blessington examines an often overlooked topic in this field: the efficacy of different approaches used by companies to set sales quotas. He compares (a) annual versus quarterly quota-setting accuracy and (b) the use of exponential smoothing versus traditional quota-setting methods. Mark's findings shed new perspectives on quota-setting policies.*

QUOTA ROLES AND ACCURACY

Billions of dollars are spent every year on sales incentive compensation. Most of these dollars are earned on some type of quota program. Commission plans are also used, but sales compensation surveys show that quota-based incentives are more common, reaching 82% in one survey. For a good discussion of the commission-versus-bonus issue, see *The Complete Guide to Sales Force Incentive Compensation* (Andris Zoltners and colleagues, 2006).

Despite the huge amount of money paid through quotas, the process for setting quotas lacks rigor, as I document in my recent book *Sales Quotas: An Analytical Approach to Quota Setting* (Blessington,

2014). Concluding that this subject was ripe for new research, I undertook to assess traditional quota-setting formulas on the basis of published firm-level data.

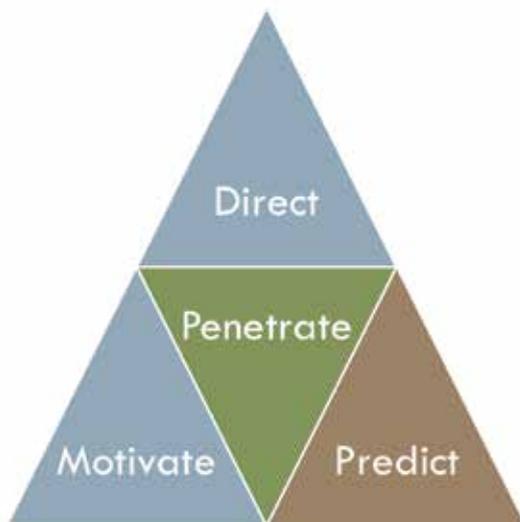
Sales quotas are used by managers to perform four roles: direct, motivate, predict, and penetrate (**Figure 1**). The first two roles are broadly recognized. Quotas are used to direct salespeople or to convey what's expected of them. They are also used for motivation: work hard and overcome daily performance barriers such as customer rejection and limited day-to-day supervision.

Less well understood is the fact that quotas perform prediction and penetration roles. They forecast future results for each salesperson and help management further penetrate the market potential of each sales territory.

Quotas can be assessed relative to each of the four roles. If quotas are well understood and aligned with the business plan, they will direct well. If quotas encourage salespeople to excel, they are motivational. When quotas reflect potential within each salesperson's market, they perform the penetration role.

My focus here is primarily on prediction. Most companies establish an annual business plan with sales targets for the corporation as a whole, for operating groups and divisions within the firm, and even for product lines and individual products. These sales targets often rely heavily on sales forecasts. If the forecasts

Figure 1. Four Quota Roles



are inaccurate, then the annual business planning process suffers. Inaccurate sales forecasts bias management toward a final sales target that is either too high or too low.

Once the sales target is finalized, it is allocated down through the sales organization during the quota-setting process. My assertion is that if sales management does not have accurate sales forecasts for regions, districts, and territories, then the quota-setting process is at a distinct disadvantage. On the other hand, when geographic sales forecasts are accurate, then final sales quotas can be far more accurate and quota achievement will be distributed closer to 100%.

The forecasting profession has much to offer in improving quota setting. Proven forecasting methods such as exponential smoothing can detect patterns in geographic sales data that even the most experienced sales manager can miss. Forecasting technology also offers highly effective error metrics that can be used to help drive continuous improvement in geographic sales forecasting.

My wish for the forecasting profession is that it becomes integral to line management, rather than merely acting as a sideline staff function. For this to happen, it needs to share accountability for the final outcome. If the forecast was more accurate than the target, then the forecaster needs to get a lot more persuasive with line management the next time around.

THE OPPORTUNITY

The potential benefits from improved quota accuracy are substantial (**Figure 2**). They include improvements in:

- **Sales force motivation.** When salespeople receive more accurate quotas, the overall quota performance distribution is narrower and centered closer to 100%. Quota achievement is more reflective of individual effectiveness rather than random noise from inaccurate quotas. Accurate quotas are perceived as fair, realistic, and achievable. They encourage salespeople and

Key Points

- When quotas are close to eventual sales results, salespeople are more motivated because the quota-setting process seems fair. Senior management is pleased as well.
- My analysis shows that quotas are better set on a quarterly rather than annual basis. It also indicates that quarterly exponential smoothing yields more accurate quotas than traditional quarterly quota-setting methods.
- Firms must anticipate implementation barriers in converting from annual to quarterly quotas, as well as the possibility that sales representatives may try to game the system by delaying sales orders to maximize future bonus payouts.
- There also will be inconsistencies between exponential-smoothing quotas and the sales target called for in the annual business plan. The difference can be reconciled by uniformly nudging quotas up or down to match the target. It also helps greatly when the sales target is accurate to begin with.

managers to place more trust in quotas and focus on results rather than disputes over quota accuracy.

- **Sales organization sizing.** When the quota-setting process is supported by accurate predictions of future sales, management has an opportunity to properly reconcile sales targets and quotas with expense budgets.

Figure 2. Potential Quota Accuracy Benefits



This helps to ensure that sufficient sales resources are allocated to the sales organization.

- **Territory alignment with market potential.** Forecasting models can detect underlying market potential and share dynamics within each sales geography. This helps managers set higher growth quotas for low-share territories and the reverse for high-share territories. When quotas are aligned with underlying market-share dynamics, salespersons must stretch to reach their territory's full potential.
- **Business plan achievement.** Senior executives generally dislike surprises, especially when sales forces miss quotas. In contrast, quota accuracy is comforting. Intuitively, executives are skeptical of skewed or lopsided sales-quota achievement distributions. They interpret them as a high-volatility risk and ask questions like, "Why is this rep so far below quota?" And, "Did you set the quota too low for the rep at 150% of quota?"

Based on my experience with hundreds of sales forces, quota accuracy leads to higher sales, better returns on sales-force investments, improved market penetration, and better alignment with the business planning process. Unfortunately, the quantitative proof of this assertion has yet to be established through a rigorous study. What I can do, though, is establish the value of quarterly quotas and exponential smoothing in the quota-setting process.

QUOTA MATH

Sales managers typically take two steps in quota setting. First, they set a baseline quota. Second, they apply judgment to establish a final sales quota. This study asks, what method provides the most accurate baseline quota?

The two most popular techniques for setting a quota baseline are:

- **Uniform-Growth Quota.** The percent growth rate established in the annual business plan is rolled down to lower levels. For example, if the

business plan calls for U.S. sales to grow at 5%, a 5% growth rate is allocated down to all U.S. regions, districts, and territories.

- **Relative-Growth Quota.** The budgeted growth volume for a higher level in the sales organization is allocated down to lower levels relative to prior-year contribution to total volume. For example, a territory contributed 17% of prior-year sales, so the territory is allocated 17% of the district's budgeted growth volume.

Both of these are referred to as *top-down quota setting*.

To the average salesperson, uniform-growth quotas sound fair. For them, it makes sense that their quota requires the same growth as the overall sales organization. However, uniform-growth quotas are best used when territories are about the same size and have about the same growth capability. Unfortunately, they are often imposed when these criteria are not met. What if one territory is very large and another is very small? The uniform-growth rate could be too easy for the small territory and too difficult for the large territory.

Relative-growth quotas also have limitations. They are most effective when all territories have similar growth rates. This way, their future growth contribution is likely to be the same as their current growth contribution. But what if territories have very different growth trajectories? Then their future contributions are likely to be quite different. Relative-growth quotas are often used despite disparate growth trends across territories.

An alternative to the uniform- and relative-growth methods is to base quotas on sales forecasts for each territory. This is a clear departure from top-down quotas because a quota baseline would be established at the territory level.

Exponential smoothing is the most common sales forecasting method in practice. It projects the patterns in historical sales and can be fully automated. So the relevant question is, can exponential smoothing provide more accurate

baseline quotas than the traditional top-down procedures?

ANNUAL VS. QUARTERLY QUOTAS

So far, we have not discussed quota time frames. Most companies go through an annual planning cycle. Once business targets are set, they are passed over to the sales organization and quota setting begins. The tradition is for managers to use the uniform-growth or relative-growth methods to set annual baseline quotas, and then divide those into whatever frequency is called for by the bonus program. For example, since most quota bonuses are paid quarterly, the annual baseline quota is divided into four amounts, often according to seasonal patterns.

There has been a recent swell of research on the topic of forecast aggregation. For example, a recent *Foresight Guidebook* (2015) was dedicated to spatial and temporal aggregation for product hierarchies.

From a forecaster's perspective on quota setting, the tradition of starting with an annual quota and dividing it into the required time frequency may not be best. In an earlier forecasting study (Blessington, 2015), I found that four quarterly sales forecasts are more accurate than a single annual forecast. So the following question deserves careful attention: should quotas be annual or quarterly? In other words, are four quarterly forecasts more accurate than a single, annual forecast that is then parceled among the quarters?

A note on terminology. A quarterly quota is not the same as a *quarterly year-to-date* (YTD) quota. The quarterly quotas I examine here are commonly called *quarterly stand-alone* or *quarterly start-over quotas*. From a forecast-accuracy perspective, quarterly YTD quotas are equivalent to annual quotas: while a YTD system delivers pay more quickly, the salesperson is still held accountable to the annual number.

COMPARING QUOTA ACCURACY

In this new study, I compare the accuracy

Table 1. Accuracy (MASE) of Six Quota Alternatives

Quota-Setting Method	Time Frame	
	Quarterly	Annual
Uniform Growth	84%	109%
Relative Growth	86%	106%
Exponential Smoothing	72%	109%

of six quota configurations, as shown in **Table 1**. There are three quota-setting methods, and each is applied to annual and quarterly time frames.

The data for the study 18 monthly micro time series from the *M3 Competition* (Makridakis and colleagues, 2000), which is probably the most studied data in forecasting. The particular monthly micro datasets I selected are N1402 through N1419 and can be found at <http://forecasters.org/resources/time-series-data/m3-competition/>.

The M3 competition asked forecasters to submit forecasts for up to 18 months ahead. In this study, I reduced the time frame to 12 months to correspond with annual quota setting. In addition, I reserved the final 12 months of each series as out-of-sample or test data for assessing quota accuracy.

The accuracy metric I employ is a variant of the mean absolute scaled error, or MASE, which has been shown to provide a reliable basis for averaging forecast errors over different series (Hyndman, 2006). The MASE, in essence, is a ratio of the forecast errors from a chosen method to the historical fitting errors from a naïve (no-change) forecast. A lower MASE indicates better forecast accuracy. When the MASE exceeds 100%, the forecast is less accurate than a naïve forecast. As applied to quota setting, my naïve quarterly forecast is no change from the same quarter sales in the prior year, and the naïve annual forecast is prior-year annual sales.

Table 1 shows that quarterly quotas are more accurate than annual quotas. For

annual quota setting, regardless of the method used, the MASE exceeded 100%. This means that, on average over these 18 time series, nothing bested the setting of quotas as equal to the prior-year annual sales.

For the quarterly time frame, all methods improve upon application of naïve forecasts, but quarterly exponential smoothing is noticeably more accurate than quarterly uniform or relative-growth forecasting. The takeaway from this analysis is that, on average, the most accurate quotas result from application of exponential smoothing to generate four quarterly quotas.

For the precise details behind the calculations, please see chapters 16 and 19 of my sales forecasting book (Blessington, 2015).

The findings in Table 1 are limited in that they don't – and can't possibly – reflect every quota-setting situation. Managers should conduct similar tests for their own sales forces. That said, I believe I've represented a wide enough variety of situations to recommend the following:

Use quarterly quotas rather than annual. It is exceedingly difficult to set accurate annual quotas. As noted, the best method for setting annual territory quotas in this study was simply using prior-year actual sales! No value was added by applying the traditional quota-setting methods or exponential smoothing.

Since annual quotas are inaccurate, YTD quota systems are inadvisable. The

A 12-14 point accuracy advantage (72% versus 84% and 86%) was achieved by using quarterly exponential smoothing rather than quarterly uniform- or relative-growth quotas.

An additional benefit from exponential smoothing is that quota setting can start before the business planning cycle is finished. Baseline sales quotas can be set for the whole sales organization in parallel with the business planning process. Once the final sales target is delivered to the sales force, reconciliation and final adjustments can commence.

And yet when all's said and done, even with the clear improvements such adjustments are likely to make in a company's quota-setting process, there are barriers to implementing these recommendations.

IMPLEMENTATION BARRIERS

What difficulties are encountered when converting from annual or YTD quotas to quarterly start-over quotas?

Converting to Quarterly Start-Over Quotas

One concern is that the annual target will not be achieved if lower levels in the hierarchy are not held accountable to it throughout the year. Here, you need to ask yourself what's more important: accountability to an inaccurate annual territory number, or accountability to a more accurate quarterly territory number. As I've said, managers can maximize the power of their quota program by setting quotas as accurately as possible.

It is often foolish for salespeople to game order timing; it puts sales at risk. If a salesperson is foolish, then this is a coaching or, sometimes, even a termination issue, not a compensation issue.

YTD mechanism holds the salesperson accountable to the less accurate annual quota. Converting from YTD to quarterly start-over increases quota accuracy, which in turn should improve motivation and the overall effectiveness of the compensation plan.

Use quarterly exponential smoothing rather than traditional quota setting.

A valid concern with a quarterly start-over bonus program is *gaming*: delaying sales orders for future quarters to maximize future bonus payouts. In most situations, companies want sales to be recorded as soon as possible. If the sales compensation plan encourages salespeople to manipulate order timing to maximize bonus payouts, a conflict of interest

is created. So a critical question is: do salespeople have a real and significant opportunity to delay orders for future quarters?

Customers often mitigate against gaming. First, customers – not salespeople – usually dictate order timing. If the customer sees that an order has not been placed, he or she can give it to a competitor, or even shift all their business to a competitor. In other words, it is often foolish for salespeople to game order timing; it puts sales at risk. If a salesperson is foolish, then this is a coaching or, sometimes, even a termination issue, not a compensation issue.

If salespeople do have the opportunity to manipulate timing, another solution might be to calculate over-quota (performance over 100%) payouts on a YTD basis, but calculate under-quota payouts on a quarterly start-over basis. This removes the incentive to game orders to increase quarterly volume on high over-quota payout rates.

Tying to the Business Plan

In most companies, sales managers must tie their sales quotas, in the aggregate, to the annual business plan. For example, if exponential smoothing is used to generate territory quotas, then there is a good chance that their sum will not exactly match the top-down district sales target. A final tie-in can be obtained by following these steps:

1. Generate draft territory quotas with exponential smoothing.
2. Determine the size of the gap between the territory quota sum and the district target.
3. Allocate (i.e., add or subtract) the difference using a uniform method such as territory percent of total district volume.

Unfortunately, tying to the business plan can make accurate quotas less accurate. In my experience, sales quotas tend to err on the high side. One cause is over-optimism. Another is a practice called “over-assignment” or “padding.” Managers take the revenue target from the business

plan, bump it up, and then allocate the higher target down through the sales organization. This process converts an already challenging business-plan target into even more challenging quotas for lower levels in the sales organization.

The point here is that accurate quotas are needed up and down the sales organization. If the company sets an unrealistically high sales target in the business plan, or if quotas are inflated within the sales organization, then quota accuracy and compensation-plan effectiveness suffer.

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