
Customer Appetite – Art of Science

By: M. Scott Moon



Today, virtually all companies are dealing with the reality of a sluggish business environment. We have all been spoiled by the euphoria of the past ten years. The recent increase in inventories and markdowns are signs of these easier times. This phenomenon should make us realize that we have become lulled into the expectation of constant business growth.

To this end, some business executives are accused of having failed to remain alert at the helm to understand the factors driving consumer behavior and profitability. Should we have been able to see the signs, or did the events of September 11th drive the current business cycle? The fact is that the signals of a recession were there well before September 11th ... and well before the public and the Federal Reserve announced our economy showed signs of pending trouble.

Business forecasting should rely on more than just the “feel” from senior management. Today’s market forecasting process calls for the use of unbiased analytical approaches to produce predictive models. In these times we will have to work harder, and be smarter, to maintain the position we seek. The advent of comprehensive data warehousing solutions enables businesses to now have access to more information than before. The question we should ask ourselves is: 1) Are there better processes and concepts we could harness to enrich the decision process? 2) What are these?, 3) What is involved?, and 4) How does an enlightened manager seek the power of these tools?

In this article we serve to review the possibilities for the application of enhanced statistical modeling techniques and demonstrate the value they can add. We contend that the current reliance on internal historical information alone does not properly prepare a business for conditions it has not experienced before. We wish to illustrate how statistical modeling techniques can be used to reveal evolving patterns and relationships in advance of the actual market environment to help steer companies through conditions previously not experienced. We hope to demonstrate that if properly applied; important shifts can be anticipated and addressed before the potential negative impacts attack the company’s profit position.

Forecasting Defined

The term “forecast” is derived of two important components: 1) the prefix “fore” meaning¹ before in time, place, order, or rank, and 2) the suffix “casten” meaning¹ to contrive. It is the second term in this word that drives most businesses into a tailspin. This term “contrive” is derived² from the term “controver” which means to find out, or imagine.

As defined, forecasting then is the process of imagining the future before it occurs. What we seek is the ability to “see over the hill” before we get to the top. Once one arrives at the top of the hill, the target is easier to see, and everyone sees the same thing. The point is there is great competitive advantage in having the proper tools to have advance vision.

In the quest of forecasting, we are attempting to fundamentally understand the nature of a particular business environment. It seems that all too often we allow our intuitive imagination to take over in this quest. As a result, we fail to rely on the science within the process. The advent of today’s modern computer systems now enables us to have less reliance on mere intuitive imagination of our business executive to understand performance behaviors.

¹ David A. Guralnik ed., Webster New World Dictionary, 2nd ed. (New York, NY.; Simon & Schuster, 1980), pp. 544-545.

² David A. Guralnik, ed., Webster New World Dictionary, 2nd ed. (New York, NY.; Simon & Schuster, 1980), p 309.

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Forecasting Defined

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We can unlock the power of the current analytical software and computer equipment to better understand the past and how it will predict the future.

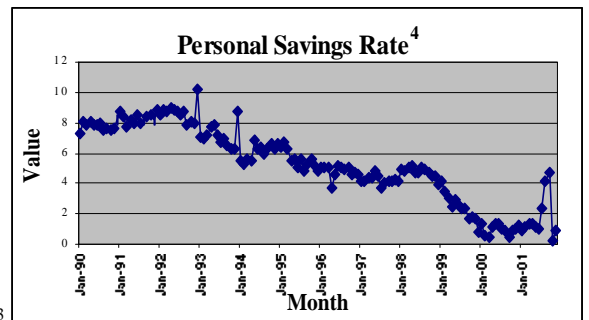
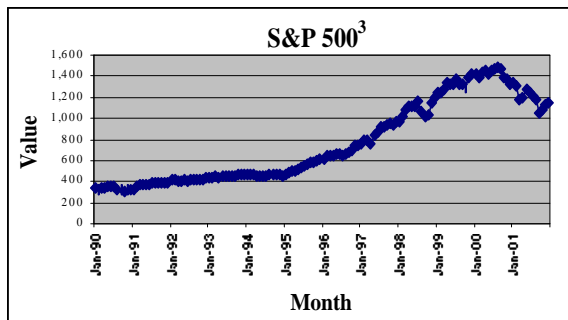
Initially, the process seeks to understand the relationships derived from historic decisions and patterns. This knowledge is integrated with many diverse and complex “signals” in ways that even the most astute and creative human minds could not fathom. In the end, an understanding of all dynamics from the past is understood to help in better understanding the future.

Many believe that history continuously repeats itself. The “wiser” business decision makers recognize this trend and seek the lessons from those experiences to ensure they do not repeat the same mistakes. Further, in identifying the “why” we can also better access conditions to understand potential opportunities that may be presented. Now that computers can mine historical data quicker than ever, we should apply this adage to understand and develop the fundamental drivers of business performance. This helps business imagine the future with a whole new set of tools. Once understood, these principles and criteria become the input rules for future models.

In the future, the process of imagining the future must not be clouded by human emotion and preconception, but rather be guided by tool kits of analysis and historical learning that will help business steer clear of potential landmines. Macro economic modeling reviews past business performance and the economic factors prevalent during each period to understand the fundamental relationship that can predict the business environment and your consumer’s behavior.

Economic Trend

While the events of September 11th, and the fear it presented to the worldwide marketplace have impacted consumer activities, it is not the sole catalyst for the recent business slump. What many have failed to recognize is that the slump had already started. The economy was experiencing signs of a downtrend, but few companies had the tools and techniques to see these factors. The events of September 11th served to provide the opportunity for all of us to stop, take a breath, and recognize the general market trend.



This is not to say, however, that these tragic events did not have a major impact on life as we saw it. What these events served to facilitate is to further undermine consumer confidence. As a result, this has resulted in a further lengthening of the decline already in play. The important point to realize, nonetheless, is that the economic conditions were already in-place for a weak economy and few had the tools to see these conditions clearly.

Economic Trend

³ Standard & Poors: Security Price Index Record

⁴ U.S. Department of Commerce, Bureau of Economic Analysis

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So what tools are there to help companies acknowledge these trends? What could we have done to prepare ourselves and not be caught off guard? These macro economic trends were visible in generally reported information. The key is to unlock the relationship between your performance and factors that are predictive of **your** customer's behavior.

It is important to recognize that each company will have a different relationship between their performance, the macro economy, and predictors of their business. We are not proposing this is a one size (or model) fits all solution. Rather, these are processes that require robust statistical processes and solutions to define the optimal solution for each business uniquely.

Neither are we proposing that one can now turn the important decision making work over to computers, as much as we wish that were possible. What we do propose is that management needs more help in making the important business decisions affecting all aspects of the business. Decision making is at best a difficult and elusive process. This is where, we believe, Management Science principles and processes can be of most help.

Through the use of statistical modeling techniques (i.e. econometric modeling), companies can readily recognize macro shifts in consumer appetite and react to optimize their business. These techniques rely on macro economic variables (e.g. Consumer Price Index) to develop the relationship between your past performance and the economic conditions prevalent at the time. As a result, it serves to remove the emotion of current modeling approaches and provide unbiased models of customer behavior.

Optimal decision making provides for the inclusion of multiple scenarios and views to help see the conditions from different perspectives. Without the inclusion of a perspective that provides a view that includes the analysis and production of future business climate using analytics, management is making key decisions without all of the required information. Including this analysis provides a far superior understanding of the “playing field” for the executive to make critical business decisions. These decisions include a comprehensive array of business issues including ordering of materials, finished goods inventory levels, allocation strategies, and the “adjustment” of price to keep their market offerings tuned to customer attitudes, mores, and social preferences.

Current Modeling Approaches

Traditional forecasting methods utilize several simplistic methods. They typically deploy: 1) a base year comparative combined with a current business trend, 2) definition of a base period and the expected builds from this period, or 3) a simple weighted average smoothing methodology weighting the most recent performance the heaviest to determine trend. In all of these scenarios, historical information is the major perspective provided.

These tools add value in defined economic conditions, however. One such period was the strong and continued growth of the '90's. In general, these techniques are appropriate in: 1) relatively stable markets, 2) relatively consistent markets, and 3) where the current environment has been previously experienced (i.e. a predictable scenario can be established and the ratios mirrored). Fundamentally, these approaches assume and rely heavily on the appropriateness of past economic and social preferences as they apply to future conditions.

These conditions do little toward arriving at an “understanding” of past trends and how they relate to evolving economic and social factors that predict the consumer's appetite for their products. This is especially critical in times where there are, often illusive, changes beginning to stir. All of these patterns have serious implications on what has to be done in ordering, buying, allocating, and pricing processes. Simplistically, these approaches can not predict something they have not seen.

Current Modeling Approaches

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When there are major turns in consumer sentiment (including early financial market or stock market unrest), this approach becomes less accurate. In these times, the approach does not have the ability to provide proactive direction to a contrarian view. Only after the trend has become readily apparent, can these tools predict a downward trend. What results is a delayed message (see display below) to the business.

The ending business issue is increased inventories and markdowns. The business will respond, but only after there is enough evidence that it is forced to respond. By then the “cat is out of the bag”. Not only has the business lost the competitive edge, but the typical results of inaccurate forecasting has already run its course. This emphasizes the critical nature of the dynamic marketplace. The negative consequences can be seen in inventory pile up, improperly disbursed product, and necessitated price reductions. Does this sound familiar?

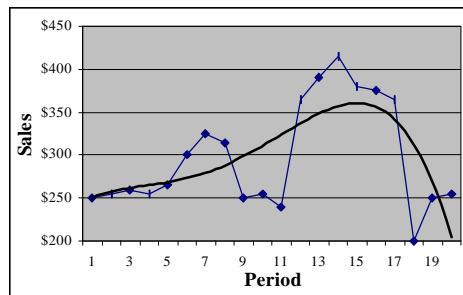


Diagram 1: Traditional Moving Average or Smoothing Approaches fail to provide businesses enough insight into changes in a timely basis. As a result, businesses react to slow to major climactic changes.

These methodologies do not understand why the performance occurred; it merely provides a means for developing a forecast. As defined earlier, it serves to provide a view of the future using limited facts and imagination. Further, it does not understand nor have the means to anticipate, the driver of their customer’s behavior and the conditions in which their business excels. It assumes that good times are a result of a strong management vision, and the bad times are a product of a tough economic condition. This premise denies the reality that while a strong management team can drive internal performance it is the macro economy in which they operate that sets the range of performance in which they will operate.

We do not want to portray the current approaches as useless. They are very sound in periods of consistency and little variability. When there are times of considerable and rapid change, however, these techniques are less useful. Whether the times are stable or turbulent, this technique in conjunction with econometric modeling will help your business prepare for any pending trend adjustment even before the implications are readily apparent.

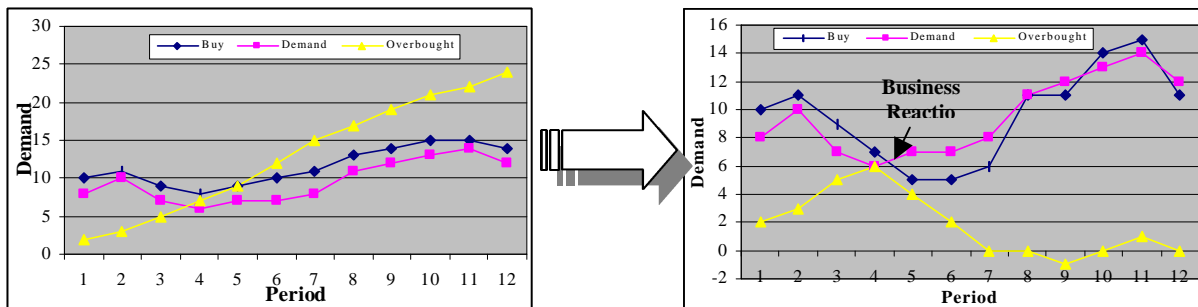


Diagram 2: Current tools and lead times delay buying decisions that result in increased overboughts. Having a better modeling process reduces this risk and allows the procurement engine to reduce buys in the anticipation of sales slowdowns.

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Current Modeling Approaches

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We also need to point out that the use of Management Science techniques alone does not guarantee success. Top management must be seriously involved in establishing the assumptions and determining the analytics they will rely on. It would be wrong, however, for management to limit the variable set to only variables they perceive are predictive. To do so will result in a suboptimal solution that fails to unlock predictive factors that may provide valuable lessons.

The business must provide focus, effort, and an openness to the tuning of the current tools to increase the accuracy of work performed. Once alignment is formed from top management, only then can the planners, using tools available for these purposes, construct the models that delivers the information required. As a perspective, no matter how good any analysis is, it should not be viewed as an endpoint. The proper role of statistics is to enable the decision making process.

A discussion of this topic would not be complete if it did not recognize that there are current planning techniques readily in use by planning departments to provide assistance in order and allocation planning. The weakness, in our opinion, is that such readily available software relies too heavily on historic performance to drive the forecasts of future extrapolations. In contrast, econometric modeling uses this information only to understand the historical relationships. This approach coupled with enhanced decision criteria and data from leading economic indicators provides a whole new level of perceptual information that allows the executive to glimpse “what’s over the hill” and at what is ahead.

Econometric Modeling

Forecast Engineering, LLC (fe) has developed an econometric modeling approach that uses a set of statistical approaches to develop a forecast. Using this approach, you begin to understand the relationship of the macro economy. For example, at the most obvious level we can use the Consumer Price Index, Production Price Index, and other accepted data to understand our consumer’s behavior.

These factors reflect the state of the general economy. Further, they help provide insight into the state of your customer’s behavior. At a more complex level, the enlightened manager can see a well thought out solution that is helpful in steering future forecasts. Proper econometric modeling helps you unlock the impact of buying the “right” goods versus reacting to current appetites to determine future projections. In the end, it can be demonstrated that the models that *fe* provides are superior in unleashing an unbiased technique for projecting your performance.

The emotional expectations of investors can subtly influence executive decision makers when viewing scenarios that deliver projections they do not want to believe are valid. This is particularly true when the models, in advance of current public attitudes, are predicting warning signals ahead. Managers need only live through times like the recent economic slow down to compare the results of these advanced econometric modeling results.

So how does it work? The technique (as defined in diagram 3) desirably seeks ten (10) years of past performance information to establish basic conceptual relationships for the business. Econometric factors are then added to understand the historical relationship between macro economic factors and the company’s performance. It is these factors, value rules, and interactions that more appropriately understand what is going on.

Because the *fe* concept is new to the marketplace, we ease a business into the logic by gaining comfort through developing quarterly business forecasts at the Buy point. This allows the business to have a view of the optimal sales plan and make the required inventory and expense decisions to drive optimal profitability. The prior sales

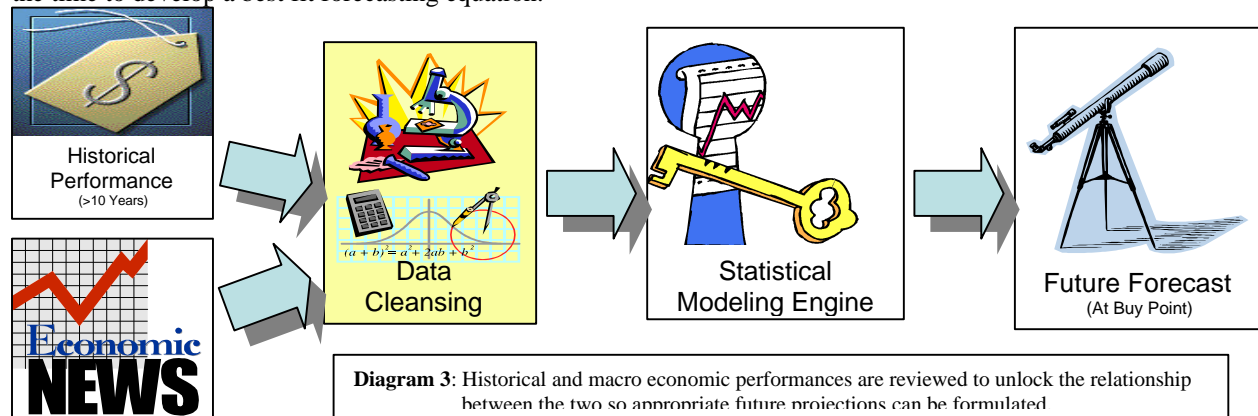
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Econometric Modeling

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data (and we would utilize as much history as is available) is combined with the macroeconomic conditions during the time to develop a best fit forecasting equation.



It is important to note that the solution being proposed is not revolutionary, but evolutionary. Many of our most capably intensive industries (e.g. Banking, Insurance, Oil/Gas, etc.) are already deploying this type of analysis. It is a technique that they have used for years to understand risk and the conditions that allow them to optimize their return on investment. We are proposing that it be applied to other industries, and to reach this goal we have created a solution that performs the heavy analytical lifting for you.

This methodology assumes the business: 1) is competing for the same customer, 2) will react to business in a similar fashion, and 3) the product mix is fairly consistent. If the business has fundamentally changed its market strategy, it is unreliable to use historic performance as an indicator for any forecasting methodology. If the conditions stated hold however, the approach not only helps you unlock the relationship of the interaction between your customer and the economy but it provides valuable information into new conditions that will help steer you through troubling times.

How many times does the future align perfectly with the past? There is never a perfect match. If this is the case, how can you use past performance as a predictor without understanding the fundamental relationships that exist to predict the future. We contend you can not. Only by unlocking the fundamental drivers of behavior can you be positioned to forecast performance regardless if it resides in your history or not.

In developing a new projection, the approach does not utilize any information or bias that may develop from past projections. This is not true, however, in many Demand Planning (true bottoms up planning based on historical performance) programs. However, each time a forecast is created it provides an unbiased view utilizing the recent information to project the requested Buy period. There is no human intervention or bias, the tool and techniques drive the solution. No longer will preconceived relationships drive your forecasting approach, it is driven by a strong analytical engine and the relationships it uncovers.

In the end, the approach serves to unlock the underlying driver of your customer's behavior. The forecasts provided define a level of confidence (defined level of accuracy) regardless of whether the company has experienced it before or not. The technique serves to define the next inflection point (up or down) so you can be prepared to deal with it.

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Case Study

This sounds great, but is it really practical? Can this approach really add value or is it a theoretical approach that sounds nice but does not work in real life? Is it a practical expectation to think that I can perform this function? The pressures of everyday life require us to prioritize our time and commitments. Without a tool of this nature, you may be putting this valuable effort toward the wrong initiatives.

We deployed this approach with a major US retailer. In doing so, we provided visibility to the recent economic environment and allowed senior management the window of insight that many of their competitors did not have. It allowed them to work through pending overboughts earlier in the process, and as a result allowed their vendors to obtain additional work to fill empty lines.

While it was uncomfortable for the business to receive this perspective at first, it provided a value to the business and helped them react differently than they would have otherwise. It not only helped in reducing future buys, but provided the visibility needed within the allocation process to ensure store inventory levels were not increasing. In the end, it provided the guidance and insight needed to maintain profits and drive increased asset productivity.

Joined with the strength of Demand Planning, this method provided the macro trend recognition that allowed the detailed planning to be performed with increased accuracy. Without this approach, demand Planning would have driven inventories to traditional levels. Only after considerable time, would the trend have been realized and order reduced. Enhancing the approach with these tools delivered the benefits of Demand Planning with the added benefit of understanding the accuracy of this detailed view in light of expected future business performance.

Benefit

The result of integrating the methods we propose into the planning process is not limited to inventory decisions. Since this information is provided at the Buy point, all costs associated with inventory and the handling of the product is viewed. This includes, but is not limited to: shipping costs, processing costs, storage costs, import costs, store handling costs, inefficiencies in store backrooms, markdowns, promotion/marketing, order preparation, and vendor price. In the end, better decisions will be reflected in increased margins and profitability.

Integrating econometric modeling provides another perspective to choose from. It provides this perspective demonstrating a range of performance that is expected. It is then up to the management team to develop and deploy an approach which defines where within that range they will deliver. The particulars under this environment determines the performance realized. Said more simply, a strong offering drives results at the top end of the range. Conversely, a weak offering delivers performance near the bottom of the range.

In selling this concept within the business, you are not forcing the business to use this method alone or the process could fail. Rather, this approach can serve as a key rudder to help understand the potential optimism that the executive team may be introducing into the forecasts when it is relying too heavily on intuition. While models of the type we propose are powerful tools, we understand that using any single method without proper consideration of management's comfort in using tools they've been used to is unwise.

Like any other product, it is critical that management is aware that what is presented is an extrapolation of its own criteria, coupled with the evolving current input of what is happening in the economy that counts. Management tools cannot be thought of a "black box" processes or they will never act on the advanced information such tools can deliver. Further, it must be clear that the planners are there to provide information management needs, even when some of the news is not what seems comfortable to them. Time has a way of demonstrating that the results of such virtual models can be very useful.

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Benefit

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Understanding your market is paramount to delivering optimal performance. Econometric modeling allows you to understand how your customers are impacted by the macro economy. This insight is incredibly valuable as you start working your way down to lower levels of detail and driving SKU level planning and allocation engines.

Business Focus Today

Today, the buzz in the marketplace is around Assortment Planning, Demand Planning, and finite market analysis. Solutions of this type serve to maximize individual market performance, but fail to address the macro economic conditions that would determine the accuracy and validity of these approaches. Most companies are focusing their energy on the management of the minute detail and have missed the big picture.

We contend it is time for business to seek a higher strategy. We recommend they start at the beginning and ensure they understand the macro economic trend before they focus on the optimization of individual sites. This will help ensure that the final strategy deployed recognizes the general market momentum and unleashes the power of a comprehensive approach.

The end approach should integrate all current tools including the econometric modeling solution as the driver. The resulting design is a holistic approach that weaves the other solutions with the power of an understanding of the general economic community. In doing so, you unlock the power of a virtual aspect of understanding future market appetite.

Don't allow your company to be caught off guard again. Integrate statistical modeling techniques that unlock your consumer's fundamental drivers of their behavior. Understand the market appetite and you can maximize profitability.