Compliance with Econometric Management Applications for Managers

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"Econometrics may be defined as the quantitative analysis of actual economic phenomena based on the concurrent development of theory and Observation, related by appropriate methods of inference."

Samuelson, Koopmans and Stone (1954)

ABSTRACT

Econometric applications have become an integral part of modern economic training and business management. Modern managers in a number of sectors are increasingly applying economic applications to their businesses in order to establish healthy economic strategies, improve understanding, create fair value, improved solutions, and surpass competitiveness. Econometric applications provide organizations with a powerful set of tools to unlock knowledge and make effective decisions. The current paper focuses on how economic applications can work for business development, and improve the company's performance by helping it outperform its competitors in the global arena.

1. INTRODUCTION

Continuous competition, exposure to global markets, rising costs, and declining interest rates, etc. makes modern business a bigger challenge than ever before. In these cases, econometric and quantitative modeling applications are used by management in companies as a powerful tool. Econometric applications provide organizations with a powerful set of tools to unlock knowledge and make effective decisions. The studies used in the field of econometrics are mainly associated with conventional research, but we have chosen to present the current discussion on the appropriateness of economic applications to management, because a number of questions arise in the minds of modern executives. What exactly did the previous sales play in deciding future sales? How do mathematical predictions really predict future sales? How can a manager look at monthly and seasonal sales fluctuations? How can a manager determine the level of company growth in a prosperous career? What kind of tools are needed in the financial sector? etc.

The answers to the above questions require a good understanding of economic strategies and methods. Business land managers are often asked to create a quality and quantity index from a variety of data sources such as base, secondary, cross section, panel, etc. An effective business plan will come where there is a basic understanding of purpose predictions that will emerge. of data. In the modern business world, it has become increasingly important to use a modern economic model to analyze data. These are very powerful models that add a person with background information.

2. ECONOMETRIC APPLICATIONS

Econometrics applications involve the development of statistical models to represent real-world economic systems, be it entire economy, or industry, or individual business. The Econometric model is used to analyze complex market trends (demand function) to determine variables that drive the growth or decline in demand for a product or service. Economic models used to define economic power affect supply and cost (supply chain function) within an industry or firm. Few companies really understand the external forces driving their industries, their companies, or their types. Understanding these strengths provides the basis for strategic development and business planning.

Managers use economic indicators as tools in the decision-making process. Economic indicators include Gross Domestic Product, inflation rate, exports, unemployment rate, personal data, etc. Business strategists use these numbers to make decisions, such as increasing purchase orders, reducing layoffs or increasing productivity, etc. for example, if an entity considers that fewer jobs are added to the economy over a period of time, it may be less likely to hire candidates with the belief that few people can afford to spend on its products. On the other hand, an increase in the sale of durable goods, such as automobiles, may force a company to increase its production if it is in a closely related industry, such as steel.

Thus, economic indicators are a useful tool even though they may formulate a fulfilled prophecy.

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Step-1: Data and summary of empirical stylized facts

The stylized facts are often summarized from observed data. For instance, in microeconomics, a well-known stylized fact is the Engel's Curve, which characterizes that the share of a consumer's expenditure on a commodity out of total income will eventually decline as the income increases; in macroeconomics, a well-known stylized fact is the Phillips Curve, which characterizes a negative correlation between the inflation rate and the unemployment rate in an aggregate economy; and in finance, a well-known stylized fact about financial markets is volatility clustering, that is, a high volatility today tends to be followed by another high volatility tomorrow and vice versa. The empirical stylized facts often serve as a starting point for managerial econometric research. For example, the development of unit root and cointegration econometrics was mainly motivated by the empirical study of Nelson and Plossor (1982) who found that most macroeconomic time series are unit root processes.

Step 2: Development of models

With the empirical stylized facts in mind, managers can develop a model in order to explain them. This usually calls for specifying a mathematical model of economic theory. In fact, the objective of economic modelling is not merely to explain the stylized facts, but to understand the mechanism governing the economy and to forecast the future evolution of the economy.

Step3: Empirical verification

Economic theory only suggests a qualitative economic relationship. It does not offer any concrete functional form. In the process of transforming a mathematical model into a testable empirical econometric model, one often has to assume some functional form, up to some unknown model parameters. One need to estimate unknown model parameters based on the observed data, and check whether the econometric model is adequate. An adequate model should be at least consistent with the empirical stylised facts.

Step 4: Applications

After an econometric model passes the empirical evaluation, it can then be used to test hypotheses, to forecast future evolution of the economy, and to make policy decisions.

3. ECONOMETRIC METHODS AND APPLICATIONS IN BUSINESS

Nowadays, applied work in business requires a solid understanding of econometric methods to support decision-making. Combining a solid exposition of econometric methods (statistics, simple and multiple regression, non-linear regression, maximum likelihood, and generalized method of moments) with an application-oriented approach provides managers to enhance the performance of a firm and help to stay ahead of its competitors. The applications of econometrics of choice (logit and probit, multi- nomial and ordered choice, truncated and censored data, and duration data) and the econometrics of time series (univariate time series, trends, volatility, vector auto- regressions, panel data, and simultaneous equations) show how econometrics can solve practical questions in modern business and management. Various econometric methods and their implications have been shown in Table 2.

The ultimate application of econometrics in management is the creation of a comprehensive model of a market, an industry, or a company, so that the interaction of all economic indicators can be understood and predicted. For instance, an example from managing an Information Technology (IT) firm; many IT firms managers (being of a technical background) inherently focus on the product by nature and have less interest in other social sciences and econometric analysis. In such a case an IT firm would carry the risk of failing to relate to the reality of economic issues such as demand, competition, client, markets and its dynamics all of this would fill through its business model and the decision making process.

Economics is a decision science. A business manager is always making decisions. The available literature on the subject highlights that not only that manager will have to be very well informed about the macroeconomics, and the economic environment of his or her firm, but the basics of supply chain management (that's economy-driven), the most advanced economics field nowadays (applied econometrics, games theory for negotiation, neuroeconomics for marketing), and of course, finances.

Table 2: Applications of Econometrics

Applications	*What it does*
Generalised Linear Modelling	Determination of independent drivers, level of causality and adjustment of forecasts with data for various categories
Segmentation and ClusteringAnalysis	Identification of similar customer groups and products to develop marketing strategies and pricing plans.
Time Series Modelling	Preparing forecasts by constructing different time series models with different distribution ideas
Constrained Optimisation	Establish business rules by calculating strong business issues for a viable solution.
GARCH (Generalised autoregressive conditional heteroscedasticity)	Identification of independent drivers, direction and level of causality of parameter measurement in dynamic environments.
Neural Network Techniques	Development of measurement techniques based on machine learning to assist in pattern identification, sequencing detection and information retrieval.
Game Theoretic Applications	The identification of outstanding strategies and the following are the best in a flexible business environment with realistic assumptions of asymmetric knowledge.
Response Modelling	Estimation of response probabilities to key marketing,pricing and operation strategies.

4. ADVANTAGES FROM ECONOMETRICS

Bennion (1961) provided that there are at least two significant contributions the economic model can make too many business decisions; and, in a sense, these contributions are inseparable. First, the user gains a qualitative-quantitative understanding that the administrator will not be able to obtain in any other way. In order to obtain a set of numbers predicted in an economic model, it is first necessary to clearly define a complete set of variables that should be included in the estimates that make up the model. Any set of numbers predicted by the model is certainly a powerful asset in the wise use of any decision-making process.

The second contribution of the economic model is closely related to the first. There are times when an economist will have more confidence in a predictable set of numbers than at other times. Often in those times when his confidence is low, he will be able to identify the reasons (i.e., the areas in his model) for his low self-esteem. Then it is easy to replace speculation — about the estimated prices of the independent variables. It is clear that any other known predictive methods can begin to successfully compete with the economic model as a basis for assessing speculation and assessing the sensitivity of human outcomes in the transformation of those assumptions.

5. LEARNING FROM OTHERS

What econometrics can learn from managers is a problem-solving environment. What managers can learn from econometrics especially their knowledge gathered in the area of economic relations and the thought expressed in acquiring it. Needless to say, these are broad statements that require appropriate qualifications. But apart from such qualifications, which to some extent deal with priorities and existing ones.

So, it doesn't really matter, the main thing is that they can learn from each other, the main reason is that they have a lot in common. In fact, they have two things in common. Another thing that is being investigated, which is often the economic crisis — either microeconomics or macroeconomics. Another analytical tool, which is mathematical to a large extent

6. OBSERVATIONS

Making good decisions has always been the work of ne plus ultra (high achievable point) of senior management. Strengthening this work with available economic strategies is not about weakening its foundations but empowering them. The discussion above clearly shows that econometric applications can be widely used in general management and especially by management. Advanced economic strategies actually provide targeted benefits. As the data base becomes more and more reliable, and new methods and technologies become available, this game has just begun. Obviously, those managers or businesses that move first in this arena will find new ways to do better than their competitors and improve their competitive position. Undoubtedly their current purpose and objectives will drive the first set of applications. It is possible that over time, firms will identify areas of the Blue Ocean, using economic plans for their businesses, which could lead to new business models or sources of competitive advantage.

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