SAS® EARN AN MBA: USING SAS IN THE MBA ECONOMICS COURSE

Joseph Earley
Loyola Marymount University

Introduction

The purpose of this paper is to present reflections on the use of SAS in the MBA required course in business economics. A discussion is presented showing how SAS has become an integral part of the teaching pedagogy. The author describes how SAS has made it possible to offer an MBA business economics course which is as empirically rigorous and challenging as the traditionally offered theoretical course.

The essence of the paper is that for every theoretical concept discussed in the classroom, SAS has made it possible to add a practical statistical dimension. The paper presents a brief overview of the central topics covered in the course. It then discusses the various SAS procedures which are used in each step and how they build in sophistication as the semester proceeds. For example, PROC UNIVARIATE, PROC MEANS and PROC CORR are introduced immediately. PROC REG, PROC PDLREG, PROC STEPWISE, PROC RSQUARE, PROC FORECAST and PROC ARIMA are then introduced as the course builds.

The overwhelming conclusion reached after experience teaching this course is that SAS has made an invaluable contribution to the class. SAS has allowed the course to be both more challenging academically and interesting to the MBA candidates.

After gaining some experience in teaching the MBA business course, I realized that the solution to offering a challenging, rigorous course was to make the theoretical concepts more concrete by combining the discussion of each topic with a statistically-based empirical project. The principal mainstay of this approach was the use of SAS statistical procedures. The ease with which the MBA students learned the SAS system allowed us to use rigorous statistical methods far beyond what I thought would be possible in a one semester course.

Structure of the Course

The first step in implementing this approach was to review some statistical procedures. Most students will have completed a course in statistics by the time they reach the business economics course. A brief review of elementary statistical concepts was followed with a one-hour discussion of regression analysis - the main statistical tool of the economist. Handouts describing the procedure were made available. This was followed by a description of our computer facilities (mainframe SAS is installed on our system). A short segment of the next class was devoted to running a SAS PROC REG procedure. For example:

Data Example 1 :
Input X Y ;
Cards;
3 9
1 5
2 7
5 14
4 10
;
Proc Print;
Proc Reg;
Model Y = X / P R CLM DW ;
Output Out=out p=P ;
Proc Plot Data = out;
Plot Y'X =' A' P*X='P' / OVERLAY;

This exercise illustrates the ease with which the SAS system allows the student to use powerful statistical procedures available with minimal manual study. Following is a list of the economic content discussed in the course, along with a brief mention of the SAS procedures used.

The MBA Business Economics Course

The MBA (=Master of Business Administration) degree consists of approximately 36 to 45 credits of work in courses such as accounting, marketing, business law, international relations, personnel and the like. Usually each student must take certain core courses in these areas, followed by electives and specialized courses in one or two areas of concentration. Among the required courses that are usually included in the core is the course in business economics. The directive given to instructors of this course is that it cover the scope of economics both macro and micro. In addition, the course should be taught at a rigorous level, in order to distinguish it from survey courses at the undergraduate level. Among the required courses that are usually included in the core is the course in business economics. The directive given to instructors of this course is that it cover the scope of economics both macro and micro. In addition, the course should be taught at a rigorous level, in order to distinguish it from survey courses at the undergraduate level. This directive creates an interesting challenge for an instructor. The major complaint of business majors taking courses in economics is that the material covered is either too theoretical or irrelevant. At the graduate level in business this criticism compounds.

The overwhelming conclusion reached after experience teaching this course is that SAS has made an invaluable contribution to the class. SAS has allowed the course to be both more challenging academically and interesting to the MBA candidates.
Economic Topics

Microeconomic:
Demand and Supply Analysis
- PROC PLOT, PROC MEANS,
- PROC UNIVARIATE, PROC CORR, PROC REG

Production Theory
- PROC REG
<Various transformations: e.g., log>

Cost Theory
- PROC REG, PROC FORECAST

Macroeconomic:
Consumption Theory
- PROC AUTOREG, PROC STEPWISE, PROC RSQUARE

Monetary theory
- PROC STEPWISE, PROC PDLREG, PROC CORR, PROC REG

Inflation
- PROC RSQUARE, PROC REG, PROC PDLREG, PROC CORR

Monetarism
- PROC REG, PROC FORECAST

Economic Growth
- PROC ARIMA, PROC REG

Country Studies

Exchange Rate Analysis

Final Project:
- Students use new procedures such as:
  - PROC ARIMA <TRANSFER FUNCTIONS>
  - PROC X-11
  - PROC SYSLIN <for 2SLS>
  - PROC JACKREG
  - PROC REG <trigonometric>

In the macroeconomic section of the course the consumption function is estimated. Since this function has several arguments on the right hand side, PROC STEPWISE and PROC RSQUARE are introduced to illustrate how candidate regressors may be selected. Since estimating this function results in two-stage least squares and the 2SLS option under PROC SYSLIN.

Also, since the Durbin-Watson statistic from PROC REG indicates first-order auto correlation, PROC AUTOREG is mentioned with a discussion of how generalized least squares <GLS> is used.

Our discussion of monetary theory and inflation leads an investigation as to the manner in which variables influence each other over time. This naturally leads to the use of PROC PDLREG to estimate an Almon-polynomial distributed lag model. As we develop these new procedures, students are asked to review previous projects and use these procedures for comparison. Finally, most interesting from the viewpoint of statistical sophistication, is the project students develop as part of their final project. In the past new procedures such as PROC ARIMA, PROC JACKREG, PROC X-11 and PROC REG with trigonometric transformations have been used.

Conclusion

The overwhelming conclusion reached after experience teaching the MBA business economics course is that SAS has made an invaluable contribution to the class. The use of SAS has allowed the course to be both more challenging academically and interesting to the MBA candidates.

By combining the discussion of each economic topic with a statistically based empirical project, the MBA students were able to pursue rigorous statistical methods far beyond what I thought would be possible in a one semester course. The principal mainstay of this approach was the use of SAS statistical procedures.

References