2-27-2008

Economic Stimulus: Charting the Cautious Course; Econometrics Versus Regression Analysis

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ECONOMICS COMMENTATOR

ECONOMIC STIMULUS: CHARTING THE CAUTIOUS COURSE

by
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Recent headlines have announced somber economic news: an unemployment rate that increased by three-tenths of a percent in December 2007 to 5%; a 4th quarter GDP growth rate of only 0.6%; a housing foreclosure rate in 2007 that doubled the 2006 figure; billion dollar write-downs by global investment banks of sub-prime mortgage backed assets, and ultimately, the fear of imminent US recession.

Less than a year on the job, Federal Reserve chairman Ben Bernanke quickly has his plate full. In following the footprints of his iconic predecessor, Alan Greenspan, Bernanke does not lack for free advice for righting the economy. Some in the financial sector have called for draconian rate cuts in the key fed funds rate (which acts as the bell cow which other rates follow) by 200 basis points, from its current 3% to 1% - its nadir under the Greenspan regime. Seeking a quick fix in heading off recession, Congress recently passed a fiscal stimulus package of approximately $150 billion, or, a bit more than 1% of current GDP. As recessions tend to reduce GDP by 1% - 2%, this would seem the classic prescription of "leaning against the prevailing economic wind" perhaps just enough to right the economy.

However, Ben Bernanke's primary charter as Fed chairman and author of monetary policy, maintaining stable prices, should be accorded a higher weighting. Unfortunately, this policy benchmark is sometimes overlooked, particularly when recession clouds build on the horizon. Like Homer's Odysseus, Bernanke must chart a careful course between the Scylla of
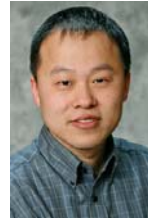
ECONOMETRICS VERSUS REGRESSION ANALYSIS

by
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Econometrics and regression analysis are different. In some sense all differences boil down to one thing: objectives. If interest is in the overall association between variables, use regression analysis. If a causal relationship or a ceteris paribus effect is the goal, use econometric models. For example, consider the relationship between students' grades and their attendance. We start with a simple regression with grade on the left hand side and attendance on the right hand side. Then we hear the following talk between a statistician and an econometrician:

Statistician: Gee, I am lucky. This regression is just what I want. Look at its high R^2.

Econometrician: Forget about R^2. I am worrying about the coefficient of attendance, which says that on average a student attending one more class can earn 2 more points in exams. I don't believe attendance is that important. Maybe we forgot about controlling for something. How about using GPA as another independent variable?

Statistician: That is a bad idea. Multicollinearity will arise if you add GPA. People with a high GPA are more likely to be motivated and thus have good

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rising unemployment and the Charybdis of unacceptable inflation. Steer too hard to avoid one evil, and the other beckons.

History provides evidence that previous pump-priming to stave off or mitigate recessions has often generated inflation, of a severity to require strong intervention and consequent recession. In the 1970's, the Fed, then under the command of Arthur F. Burns, intervened with stimulus to combat stagflation generated by the first oil crisis and rising commodity prices. The inflationary fires were kindled and smoldered throughout the 1970's – only to flare up wildly at decade's end. "Tall Paul" Volcker was appointed by President Carter in 1979 to quash double-digit inflation. Volcker was successful in ratcheting down inflation to 5% within several years – but at the cost of the deepest recession since the Great Depression. In 2001, Alan Greenspan brought interest rates down (the federal funds rate fell to 1%) in the wake of 9/11, a short recession, and the bursting of the dot.com stock market bubble. This excess liquidity pumped into financial markets provided the genesis for cheap money, a soaring housing market, irrational lending practices, and the sub-prime lending crisis which in 2008 has affected nearly all sectors of the US economy and global markets as well.

But, how to plot the careful course? With the swirl of political winds and conflicting economic perspectives, this presents a daunting task for the Federal Reserve and Congress. While the Fed was chartered in 1913 to be completely independent of political influence, reality dictates otherwise. There are two instruments used to counter macroeconomic destabilization, monetary (the Fed) and fiscal (Congress and President) policy. At the moment, it appears that, together, the policy that has been implemented may constitute "overkill" with inflation the primary fallout and future recession, a possible accompaniment.

First, policymakers are vigorously attacking recession when none, yet, exists. Granted, growth in 4th quarter of 2007 was puny indeed at 0.6 percent, but recession is defined as six consecutive months of **declining** GDP. It is quite possible that measures already put in place, such as the 125 basis point decrease in the fed

funds rate, may trigger sufficient easing in other critical rates to keep the economy out of recession, or, at the very least, help shorten and flatten any slump to less than a year and 6% unemployment. Second, neither tax rebates nor further interest rate cuts can possibly impact the present quarter, which very well may see negative GDP growth. Monetary policy acts with a lag of 6 to 18 months and tax rebates will not be spent until late May or June at the earliest. Third, these very policy instruments may impact the economy at a time when inflation is becoming the larger problem. In 2007, the CPI-U, including food and energy prices, rose by 4.1%, the highest annual increase in 17 years.

With stabilization policy, timing may be as important as the instruments used. There are some signs that interest rate cuts already implemented are finding traction. Rates on the traditional 30 year mortgage have fallen a full percentage point over the past six months and refinancing activity has tripled since December. Also, lower fixed mortgage rates should exert downward pressure on adjustable mortgage rates and help the transition to a higher percentage of fixed rate financing. Finally, recently enacted tax cuts may not prove the hoped-for stimulus to consumer spending. Polls indicate a substantial portion of the tax cuts may go to paying down consumer debt or into savings. If these monies are not recycled one for one into new loans because banks are uneasy about extending new credit, then the positive impact is lessened.

While the Federal Reserve is the most powerful force for economic stabilization in the US, the word "myopic" best describes its ability to foresee the ramifications of policy actions. Following the bursting of the dot.com bubble in 2000 and the shrinkage of the Nasdaq composite index to ¼ of its historical high, Chairman Greenspan pushed the fed funds rate down to one percent, but then held it too low for too long, contributing to the housing boom-to-bust cycle we are experiencing.

Summarily, the timing of stabilization initiatives are as important, if not more so, than the policy instruments selected. Estimating when economic policy will impact is not an exact science, and its strongest effects are as likely to come at an inopportune time as at a propitious time.

Accordingly, the full legacy of any Fed chairman is revealed several years after departure, after the ripples of policy action have run their course. Thus, the nexus between a Chairman taking leave of the Fed and hagiography-in-progress should be an extended one.

attendance. In other words, attendance and GPA are highly correlated. We better drop one of them.

Econometrician: I disagree with you. If you drop GPA, basically you put it into the error term. In that case, how can you make sure the coefficient of attendance measures its ceteris paribus effect? By definition, the ceteris paribus effect of attendance is obtainable only if all other factors are held constant. In this case, if attendance changes, the error term (containing GPA) must change at the same time. Your results without GPA on the right hand side will have omitted variable bias.

Statistician: I don't care about the ceteris paribus effect. I just want to find a linear relationship between grades and attendance.

Do you see my points? Statisticians and econometricians have different goals, and therefore pay attention to different details. If problems arise they have different remedies. A statistician running regression analysis may get worried if he sees the following:

1. A low R^2, which means a good linear fit between variables has not been found or the linear association between variables is not strong.
2. Multicollinearity between independent variables, which leads to inflated standard errors and unstable estimation results.
3. Patterns in residuals signifying heteroskedasticity and serial correlation, which suggests that there are estimators (such as generalized least square) better than ordinary least square (OLS).

On the other hand, an econometrician's job is not done if he finds the following:

1. The key assumption of zero correlation between the independent variable and error term is violated. That means he has not controlled for enough other variables in order to estimate the ceteris paribus effect of the key variable. If data of those variables are available, he may explicitly use those variables as explanatory variables in a multiple regression.
2. Heteroskedasticity and serial correlation in error terms. Instead of using generalized least square, an econometrician is more likely to stick with OLS, but with an adjusted formula for standard errors of coefficients (called heteroskedasticity and autocorrelation consistent, or HAC, estimator of standard errors).
3. A sample not representative of the population. This may be caused by sample selection. An econometrician may use the procedure of Heckman to correct the bias. Similarly, special models (such as Tobit models) are necessary if the data are cornered, censored or truncated.
4. Nonstationary data, which means that the estimation results may be misleading (called spurious regression). The regression using nonstationary data makes sense only if those variables are co-integrated, or related in the long term.

Different goals give rise to different methodologies. As an illustration, let's compare two different procedures for variable selection.

In regression analysis, the variable selection is based on R^2. The variable with the highest simple correlation with the dependent variable is used first. Then the second independent variable is chosen based on its marginal contribution to R^2, or equivalently, its partial correlation with the dependent variable after the effect of the first variable is netted out. This process can continue until a satisfactory R^2 is achieved. The F test plays a key role in this process.

By contrast, the variable selection in econometrics is largely guided by economic theory, or common sense if theory is absent. The variable appearing in the theory should also appear in the econometric model, regardless of its contribution to R^2 and its correlation with other independent variables. Typically an econometrician drops one variable not because of multicollinearity concern, but because of its insignificant t ratio. An econometrician dislikes the ideas of forward or backward selection procedures and would call it data mining.

Specification tests, such as the Hausman test, are important in econometrics.

The list for the differences between regression analysis and econometrics is long. Here I only touch on part of it. The lesson is that you should always make it clear what you want to do before selecting the appropriate statistical methods.

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