Meta-analysis in economics

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Meta-analysis is a relatively new approach to the presentation of empirical results in economics. This approach, though, is used more and more often, as shown in Figure 1. There we present a time series of the number of hits in Econlit with the keyword ‘meta-analysis’ in any one of the fields, and the number of journal articles of that number of hits. In 1991 there were two hits, of which one was a journal article (in the Journal of Accounting Research); these numbers grew to 14 hits and 14 articles in 2001. In that year, articles appeared in mainstream journals like the Economic Journal and the Journal of Economic Perspectives. In total, Econlit lists 76 journal articles, five working papers, 14 books, one book review, and eight collective volume articles that contain the word ‘meta-analysis’.

Meta-analysis is not found in the subject index of the first four volumes of the Handbook of Econometrics. From the increase of the number of publications in Figure 1, though, we see that meta-analysis is gaining acceptance as a way to assess empirical results.

Even though economists are becoming more interested in meta-analysis, the method is not used as much in economics as it is in other social sciences. This must have something to do with the important feature that data used by economists are hardly ever obtained under controlled circumstances. Data are often derived from a data set that was compiled for another reason, and not especially for estimating some parameter of interest. In any empirical paper, this leads to potential omitted variable bias of the estimation results, and it is not clear how analysing many empirical studies – each with another secondary data set with its own typical problems – would help to solve this problem. Meta-analysis interpreted as a way to get ‘better’ point estimates does not seem to be a fruitful avenue of economic research, considering the data problems. In some circumstances the data sets may well be comparable (probably this is more likely to be the case in macroeconomic studies than in microeconomic studies), and information on the distribution of point estimates can be aggregated.

However, the temptation to consider estimates to be comparable is big. Ederveen and de Mooij write ‘From this sample, we eliminated some extreme semi-elasticities (those that are more than two standard deviations larger or smaller than the mean)’. This makes sense if one draws independent observations that are from a normal distribution. It is not clear whether that is the case in their article (CPB Report 2002/1). In fact, one would expect exploratory data analysis methods to be used when comparing estimates. A figure with a density or Box-plot (perhaps conditioned on characteristics of the study) can be more informative than a meta-analytical regression.

To use meta-analysis, one must first identify a parameter of interest. This can be difficult, especially in non-linear models (not to mention the case of semi- or non-parametric models). Suppose one has a number of studies with wage elasticities of labour market supply. This parameter depends on the point of the curve where it is calculated. Even though often only estimates are presented evaluated in the means of the variables, substantial variation of an elasticity may exist within a single study. It is difficult to compare studies when elasticities are calculated in different points.

Meta-analysis has its roots in medicine, sociology, and psychology. In these fields, replication of studies is more common than in economics. In fact, in economics there have also been...
studies to see whether published results could be replicated, with mixed findings. Dewald et al. conclude in their famous replication paper that ‘... inadvert errors in published empirical articles are a commonplace rather than a rare occurrence’. If these articles would be used in a meta-analytical study, the researcher should start thinking about errors-in-variables, and we know how difficult that problem is to solve! Fortunately, the situation in economics has improved since the early eighties: many journals nowadays require data sets to be made available to other researchers, and the use of standard statistical packages is less prone to errors than programming co-integration regression coefficients estimator oneself.

I like to think of meta-analysis as Lipsey and Wilson: ‘Meta-analysis can be understood as a form of survey research in which research reports, rather than people, are surveyed.’ This statement clearly indicates where the problems are in interpreting meta-analysis: is there non-response, does every respondent interpret the question similarly, what is the sampling frame, is sampling theory applicable, or should we just describe the data, etc. Then, after collecting the data, meta-analysis can be used to describe the data. Perhaps it is then most useful to identify the behaviour of estimates over time or geographical regions. Has the wage elasticity of labour supply decreased over time? Does it differ between Northern and Southern Europe? Meta-analysis is a useful addition to the toolbox of an empirical economist, but care must be taken when interpreting the results. These may not be so easily interpretable after all, as is the case in all empirical research.

References

Emissions trading in the Netherlands

Peter Zapfeli

Mulder (CPB) asks the question to what extent a Dutch national CO₂ trading scheme is a worthwhile effort toward an international trading scheme (i.e. is it a first step toward a European-wide emissions trading scheme) when presenting the proposal of the Dutch Commission on CO₂ trade and related economic analysis.

His conclusion – underlined by modeling results – is that a national scheme along the lines proposed by the Dutch Commission is an expensive policy instrument due to the high transaction costs. The first-best option according to Mulder is to impose CO₂-emissions trading with an absolute ceiling on an international level. In the meantime, he states, improving the design of the energy tax system may be an efficient alternative.

In this comment I would like to address two issues.

First, does the approach proposed by the Dutch Commission make sense from a European perspective towards an EU-wide cap and trade allowance scheme as proposed by the European Commission in October 2001?

The Dutch model adds to the existing and envisaged national schemes in Europe. For the time being, there are two schemes in implementation (in Denmark and the United Kingdom) and some more or less concrete plans in other Member States and European countries, like Sweden and Norway. The shared characteristic of all these existing or planned schemes is that they differ markedly from one to another. The Danish scheme comprises only power generators, while in the voluntary UK scheme, with financial participation incentives, in principle any company may participate. Such a development obviously raises concerns about the single market and may cause new market barriers due to the emerging market of emission allowances. It would be ironic if the breakthrough of quantitative market-based environmental policy in Europe would lead to a new fragmentation of the internal market. Preventing this is one of the major reasons to move to an

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