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24. Using Grid technologies for the mapping out of taxation policy

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Short overview:

It is a fact that the impact of taxes in the economy is significant. Consequently, it is very important for the Public Administration to have reliable elements and alternative scripts that are related with the effective application of tax policy. This paper presents an application which is a powerful tool for the tracing of taxation policy. The scope of this tool is to present the ongoing opportunities that Grid technologies provide to many sectors, such as the sector of Public Administration.

Analysis:

The regression that we used to appreciate the tax policy of Greek government is the following: $S_{govt} = a_0 + a_1 * T + a_2 * TR + a_3 * INT + a_4 * G$ where $a_i, i=1, \dots, 4$ are the coefficients of the regression and a_0 is the constant term, S_{govt} the Government budget deficit/surplus, TR is the Transfer Payments, INT is the Net Interest Payments and G is the Government Purchases. Due to the lack of real elements of many years, the application creates a lot of instances of data. Sample of elements for the past fifteen years were taken from the databases of OASA, Eurostat and National Statistical Service of Greece. The application exports a report that includes all the statistic and econometric results of the model with the most adequate data. Using such a kind of report the government could forecast its budget deficit or surplus setting up various scripts. Obviously, this is only a tool for examining different solutions of the taxation policy and cannot substitute the theoretical approach of the problem.

Impact:

Having a vast list of historical elements relative with interaction of various factors in the tax policy, we can seek models that can be used for formulation of forecasts with regard to the future development of important tax sizes. According to these models, we can advance in control of various affairs, altering either the prices of entries or the prices of parameters of models. Because of application's demands for memory and computational resources, it is infeasible to be executed locally in a typical computer, so a Grid should be used in order to accomplish this operation. The infrastructure of Hellas Grid and Eumed Grid gives the possibility for processing big volume of data and having substantially simultaneous control of different approaches, models or scripts.

Conclusions:

The application was developed with the high-level open source language Gnu Octave (edition 2.9.12). With the help of the infrastructure of Hellas Grid we were able to execute our application. The size of the produced data set was about twenty gigabytes and the execution time of the application was usually, since the availability of the Grid differs each moment, little above one hour.

Keywords: Grid, Taxation Policy, Public Administration, Econometrics, Octave