What Is Isolation of the Unknown?

In logic and in science, it is a basic principle to isolate the unknown thing of interest in order to observe, describe and explain the unknown thing. The unknown may be a physical substance, a mathematical quantity, a dependent variable, or any other unknown entity.

In science, it is necessary to physically isolate a new chemical element from all other elements. Madam Marie Curie, in the final step of a long arduous process beginning with pitchblende ore, separated the new chemical element radium from radium chloride, a chemical compound.

In math, it is necessary to mentally isolate the unknown quantity in an algebraic equation. By convention, the unknown quantity of interest is the left-hand side of the equation. Other than the simple cases that can be solved on sight by most persons, it is necessary to isolate the unknown variable, constant or other term before it can be solved for.

In econometrics, it is necessary to mentally isolate the dependent variable in a causal, inferential, stochastic, econometrics model. By convention, the dependent variable is the left-hand side of an econometrics model equation.

In economics and finance, it is necessary to mentally isolate a concept or operational variable of interest. Only with an isolated variable can analysis be performed *ceteris paribus*, because otherwise, there would be a contradiction of holding a given variable constant and varying the same variable at the same time. The following is from dictionary.com. *Ceteris paribus* means “with all other factors or things remaining the same”. This Latin phrase translates approximately to “holding other things constant” and

is usually rendered in English as “all other things being equal”. In economics and finance, the term is used as shorthand for indicating the effect of one economic variable on another, holding constant all other variables that may affect the second variable.

For example, when discussing the laws of supply and demand, one could say that if demand for a given product outweighs supply, *ceteris paribus*, prices will rise. Here, the use of “ceteris paribus” is simply saying that as long as all other factors that could affect the outcome (such as the existence of a substitute product) remain constant, prices will increase in this situation.

Ceteris paribus contrasts with “mutatis mutandis”, which means “The necessary changes having been made; having substituted new terms; with respective differences taken into consideration; with the necessary changes having been carried out”. Likewise, it contrasts with “pari passu”, which means “At an equal pace or equal rate; side by side; e.g., *inflation and interest rates increasing* pari passu”.

Where the process is mental and not physical, to isolate the unknown sometimes requires imagination instead of routine steps in an algorithm. Even with artificial intelligence, computer software lacks such imagination. Due to the number and complexity of the calculations, most econometric models are tested and estimated with computer software applications run on relatively high-speed, large-capacity computers. These mechanical programs will calculate the values of the econometric model parameters (intercept and slope coefficients) and related statistics whether or not the econometric model equation is isolated on the left-hand side. Therefore, computer software applications for testing and estimating econometric models cannot identify fatal fallacies such as what is known in econometrics as circular simultaneity, a form of

vicious circular reasoning. Other than trivial cases of identification, e.g., $X = a + bX + e$, circular simultaneity must be detected and diagnosed by a human.

Isolation of the unknown avoids violation of genuine method. Genuine method proceeds from the better known to the lesser known, not from the known to the equally known. Failure to isolate the unknown results in proceeding from the known to the equally known.