TELLUSANT QUICK READS

UNBUNDLING DEMAND DRIVERS USING PATH DIAGRAMS

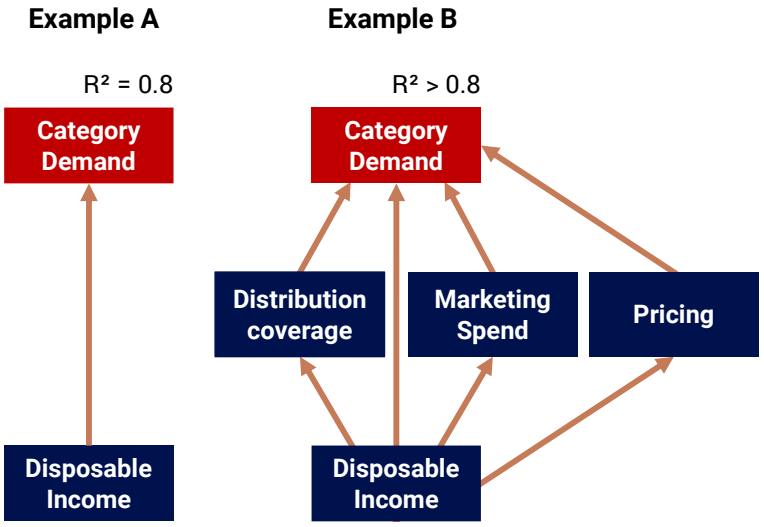
Household income is the most important driver of demand for almost all categories globally. It is so overwhelmingly important that other demand drivers seemingly pale in comparison.

Example A in the graph is what you typically find. Run a regression of disposable income on category demand and you find that 65%-85% of demand is explained by income (R^2).

As one executive at a global company exclaimed "we're slaves under economics!" This is true but let us modify the perspective slightly.

PATH DIAGRAM EXAMPLES

Graph representations of statistical / ML models



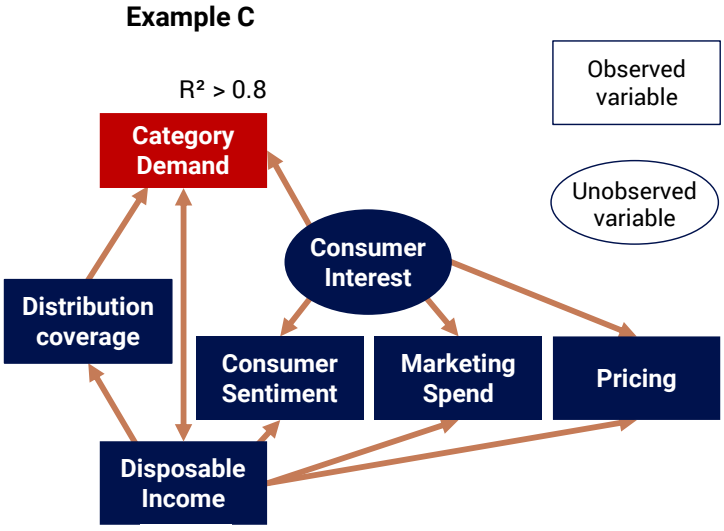
Example B introduces three other demand drivers: distribution coverage, marketing spend, and price. What happens is that the direct effect of income on demand in Example A, is now unbundled into a direct effect, and three indirect effects trough those three drivers.

In a nutshell, income has a direct effect on distribution coverage, marketing spend, and price, which in turn have direct effects on demand. (The result is a slightly higher R^2 than in Example A.)

Thus, Example A masks the importance of these three drivers. It is not that they can account of a maximum of 0.2 of the variance; it is that they are partly bundled into the income effect. The statement that income explains 80% of the variance in demand is correct, but so is the statement that the three other drivers account for 40% of demand.

We used a so-called path diagram (simplified) to illustrate the point. Path diagrams are a formal representation of mathematical equations. The boxes and arrows are not illustrative. They have exact meaning in matrix equations.

Example C is a more sophisticated example of the relationships.[1] It introduces an unobserved variable (consumer interest) and a bi-directional arrow. This leads to a generalized version of regressions called structural equation models (SEM).[2]



Source: S. Canback thought

This example illustrates another point in quantitative analysis. It is difficult to use sophisticated models in environments where the recipients have little or no statistical training, such as corporate executives.

One always must strike a balance between a great model and an understandable model. There is no point in being sophisticated if no one understands what you have done.

How to overcome the need for great models that cannot be understood? By codifying them in standardized applications. This means they are vetted once with the recipients, and then accepted as the corporate standard way to solve certain problems. Instead of opening up debate on validity over and over again as now happens, executives will focus on insights. This is what we build at Tellusant.

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[1] Example C is a variant of the Golder-Tellis demand model.

[2] Our chairman used SEM extensively in his doctoral research on why corporate diseconomies of scale: *Bureaucratic Limits of Firm Size*. http://bura.brunel.ac.uk/handle/2438/9030