

Economics and  
Complexity

## WORKSHOP ON CREATING CAUSAL MODELS

Creating a causal model is an iterative process that includes the model as well as the descriptive framework



CAUSAL MODELLING FOR  
INVESTMENT MANAGEMENT

# Schedule of the Workshop

Duration: eight hours

In presence (Location Genoa, Italy)

Price: 500 euros

Friday, January 31, 2025

Friday, February 21, 2025

Friday, March 28, 2025

# A PRACTICAL WORKSHOP

This intensive workshop offers an in-depth discussion of the techniques of causal modelling applied to finance. The course starts by presenting the classical causal models, causal Bayesian nets, SEM and SCM models with a quick reminder of System Dynamics.

Next, we discuss models of processes that cannot be manipulated as only one realization is known: factor models, Vector AutoRegressive – VAR – models, and PCA. We will show with practical examples how we can choose causal factors and how we can apply causal models to dynamic factor models.

We will then present the deployment of causal models in the case of variables that can be manipulated, in particular investment decisions. These models adopt a notion of causality as manipulability.

All examples that will be discussed in this workshop are created with TETRAD. Developed at Carnegie Mellon University, TETRAD is a free software for discovering and manipulating causal models.

The 50th Anniversary Issue of The Journal of Portfolio Management carries the article: Frank J. Fabozzi, Sergio Focardi, and Joseph Simonian, Paradigm Shift: Embracing Holism in Causal Modeling for Investment Applications.

# CAUSAL MODELS FOR INVESTMENT MANAGEMENT

Causal models applied to firms and to economies are based on the notion of causality as manipulability because the main objective is understanding the effects of decisions or policy changes.

In finance and investment management, the decision-making process is less important than forecasting. The mathematics of decision making might be very complex; however, the most critical elements are the forecasts on which decisions are made.

In finance we only have a unique realization of most processes such as prices. In order to estimate models, we must apply data transformations that yield ergodic processes. In practice, we apply models that yield white noise.

In finance, causal models apply to processes on which we cannot realistically intervene. Interventions of causal financial models are pure idealizations. Causality is embodied in the notion of mechanisms more than manipulability. For instance, we search for factors that affect prices and returns through causal mechanisms.

More classical causal models are also used in finance. For instance, the relationship between investment decisions and returns is certainly causal. Causal models can also be used in the modelling of derivatives.