

ASSET STOCK COORDINATION AND LONG-TERM DYNAMICS IN LOVE AND COMMERCE

From Romeo and Juliet to People Express

Synopsis of a Talk

John DW Morecroft

London Business School

Regent's Park, London NW1 4SA United Kingdom

+44 (0)20 7000 7000

jmorecroft@london.edu

Abstract

A fundamental idea in system dynamics is that interdependencies in business and society pre-determine the performance over time of firms and industries. This idea is often summarised in the phrase 'feedback structure gives rise to dynamic behaviour'. To illustrate I use a selection of well-known system dynamics models, spanning a range from Romeo and Juliet to People Express. I review the feedback structure of the models and the dynamics that arise from different ways of coordinating 'operations' and asset stocks. Using a variety of learning support materials I analyse asset stock coordination dynamics. The style of model analysis combines visualisation, and simulation with non-technical narrative interpretation of simulations to yield intuitively appealing insight into performance paradoxes. This approach, which belongs in the tradition of case-based system dynamics, helps modellers and executives to identify influential policy levers and to implement practical policy changes that improve functional coordination and firm performance.

Keywords: feedback structure, performance over time, behavioural decisionmaking, asset stock coordination, style of model analysis, policy design.

Predicate: Small is Often Beautiful (in Models of Asset Stock Coordination)

It is a paradox of complexity that puzzling performance through time in business and society is often observed in tiny models containing only a handful of dynamical concepts. Even the most basic dynamic process of stock accumulation is poorly understood (Booth Sweeney and Sterman 2000).

Asset Stock Coordination in Love and Commerce

Asset stock accumulation is at the heart of change over time in business and society. All business and social systems contain a variety of interlocking asset stocks or 'resources' from which dynamics arise. To illustrate this vital idea I first review the structure and dynamics of the well-known Romeo and Juliet simulator (Radzicki 1993 and Morecroft 2010). This tiny model contains just two interlocking stock accumulations whose feedback structure generates elegant cyclical dynamics – a pattern of behaviour over time that surprises many people.

At first glance it may seem that a tiny simulator of a love relationship is far removed from business operations and strategy. But really it is not. To explain why, I select a stylised system dynamics model of a manufacturing firm, and compare it visually with the Romeo and

Juliet model, I demonstrate striking similarity in the feedback structure of the two models. This visual similarity helps to explain why there is identical cyclicality in accumulations of love, inventory and workforce. I then review common and enduring features of the two coordinating networks that define the relationship between lovers on the one hand and functional areas of the firm on the other.

Operating Policy, Bounded Rationality, Dominant Logic and Asset Stock Coordination

I use structural insights from the factory model to envisage changes to standard operating policies (such as inventory control, forecasting and workforce planning) that, when implemented, should improve cross-functional coordination and boost business performance. Beneficial changes normally modify information flows within and between functions of the firm. There follows a brief review of the information processing assumptions behind operating policies. The degree of success that firms achieve in asset stock coordination reflects the bounded rationality of decision makers, the psychological environment in which their decisions are made and the resulting ‘dominant logic’ of each operating policy.

The Rise and Fall of People Express

From the discussion of operating policy and dominant logic it is but a small step to a behavioural understanding of covert asset stock coordination problems that lay behind the dramatic rise and fall of People Express (a visionary low-cost start-up airline) in the US airline industry of the 1980s.

References

Booth Sweeney L, Sterman JD (2000). Bathtub dynamics: initial results of a systems thinking inventory. *System Dynamics Review* 16(4): 249–286.

Morecroft JDW (2010). Romeo and Juliet in Brazil: Use of Metaphorical Models for Feedback Systems Thinking, Chapter 6 in *Tracing Connections: Voices of Systems Thinkers*, an edited volume in tribute to Barry Richmond, isee systems publications, Lebanon NH and The Creative Learning Exchange, Acton MA

Radzicki MJ 1993. “Dyadic Processes, Tempestuous Relationships, and System Dynamics,” *System Dynamics Review*, 9 (1), 79–94.

List of Learning Support Resources Mentioned or Used in the Talk

Morecroft JDW (2015). *Strategic Modelling and Business Dynamics: A Feedback Systems View* (2nd edition), Wiley, Chichester.

- The Romeo and Juliet simulator is in the online learning support folder for Chapter 10.
- Stylised models of a manufacturing firm are described in Chapter 5 of the book and are available as simulators in the online learning support folder for Chapter 5.
- Materials on policy structure and bounded rationality are in Chapter 7 of the book
- Materials and mini-simulators for the rise and fall of People Express are in the online learning support folder for Chapter 6.