



15.879 Advanced System Dynamics Modeling
Spring 2025
Exercise 6- Ponzi Schemes

Submit your model to the shared dropbox before the class on Friday 3/14/2025

Compared to previous weeks, this exercise provides an opportunity to build a less-structured model based on a historical case.

Ponzi schemes --fraudulent investment schemes that take money from new investors to pay previous ones while maintaining a growing investor pool with promises of high returns-- are named after Chalse Ponzi who introduced one of the earlier schemes in the 1920 in Boston. Many less notorious programs have elements of a Ponzi scheme as well, for example social security pays current retirees from money contributed (mostly) by the later generation. Many economic bubbles also share the basic speculative nature of investments at the heart of Ponzi schemes. Build a simple model of Ponzi's original scheme. Here is a brief summary of the original Ponzi scheme's story:

*"Charles Ponzi became noted in 1920, in Boston, for his supposed arbitrage scheme, which ultimately proved to be merely a masquerade for paying off early investors with the deposits of later investors. The Ponzi Scheme is named after him. He claimed he would double investors' money in 90 days through a bizarre plan to buy and resell international postal-reply coupons. (These, according to the U.S. Postal Service, then operating as the Post Office Department, actually cannot be redeemed for cash.) Ponzi collected more than \$8 million from about 30,000 investors, in just seven months, before the scheme collapsed. He served fourteen years in prison, was deported from the United States, and spent the rest of his life vainly seeking ways to provide restitution for the losses of his investors."*¹

To have a clearer understanding of the story, read some additional details from the Wikipedia (or many other online sources), e.g.:

https://en.wikipedia.org/wiki/Charles_Ponzi#Origin_of_the_term_%22Ponzi_scheme%22_and_IRC_scheme

Your goal is to build a model that:

- Replicates the historical case of Ponzi (no need for calibration to exact numbers; just qualitative match with the magnitude of historical case is enough)
- Identify the conditions under which a Ponzi scheme can continue for a long time, even indefinitely.

Given the limited time, strive for a very simple model, but make sure it captures the basic physics (of the money and what is owed), as well as key psychological drivers of Ponzi schemes. You may find it helpful to start with a causal loop diagram for this exercise, and be clear about the mechanisms you want to include for the growth and collapse of the scheme before embarking on formulations.

¹ Source: https://en.wikipedia.org/wiki/List_of_Ponzi_schemes#1920s

Submission Instructions

Put your Vensim model(s) in the shared dropbox folder under session 6. Please name your model submissions as: S06-<Last Name>-Ponzi.mdl
for example, "S06-Rahmandad- Ponzi.mdl".

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