

Critical Issues in the Recruiting and Retaining of Mathematics and Science Teachers

Systems Thinking and Dynamic Modeling Conference
June 29 – July 2, 2004

Daniel Burke

Linda Cavalluzzo

Joseph Harris

Gary Hirsch

Problem Statement:

Urban and rural high poverty school districts have difficulty in providing highly qualified science and mathematics teachers for their students. This problem is expected to become even more severe due to aging of the teacher workforce and the high attrition rate of young teachers.

Objectives of the study: Our study focuses on three central questions:

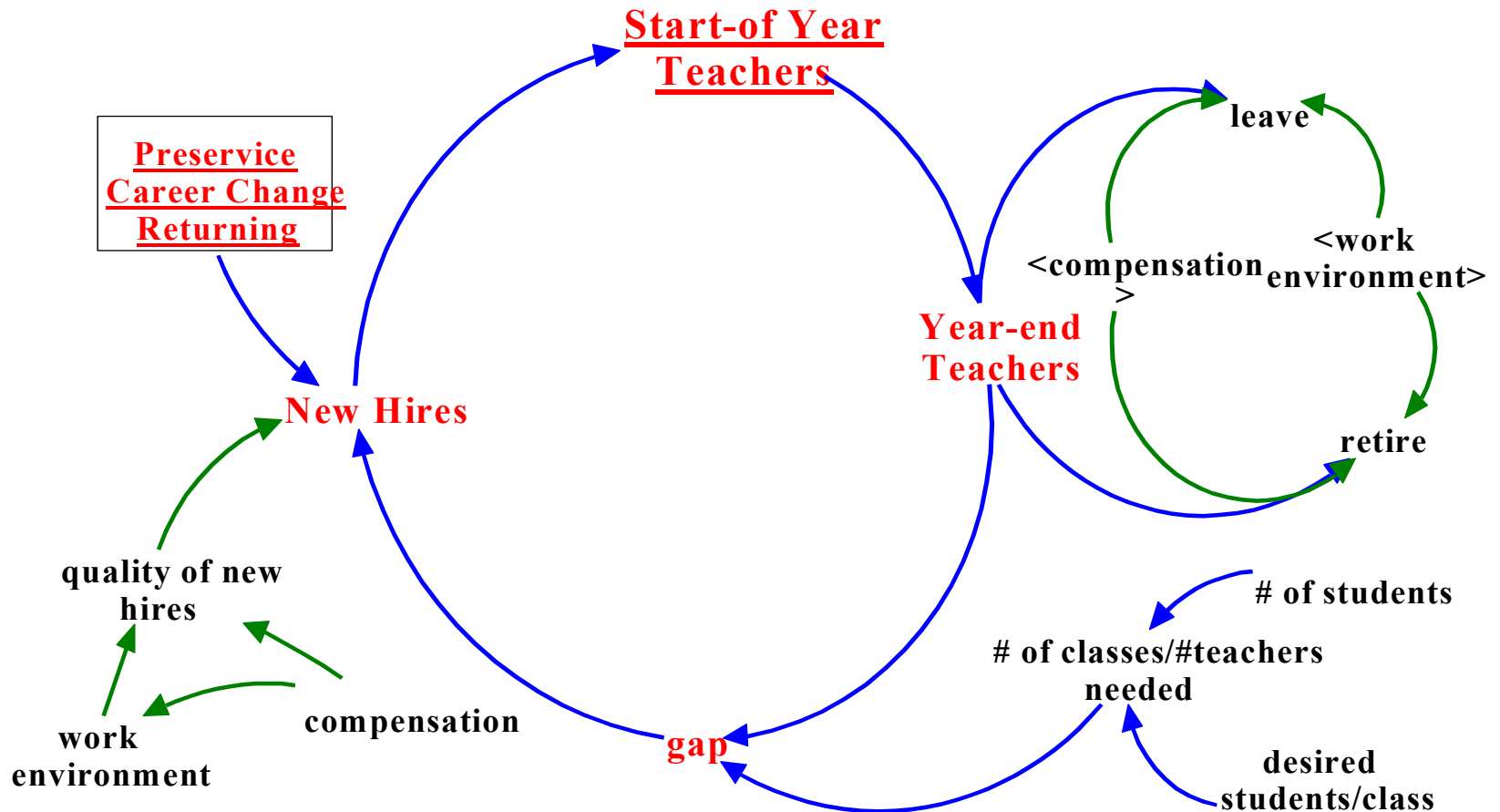
- ❑ What is the relationship between teacher characteristics and experiences and student achievement?
- ❑ What are the most effective leverage points in the personnel system for developing and maintaining a science and mathematics instructional workforce that has the desired characteristics?
- ❑ How should school districts allocate their resources (financial and non-financial) to optimize the quality of their science and mathematics instructional workforce?

Research Approach:

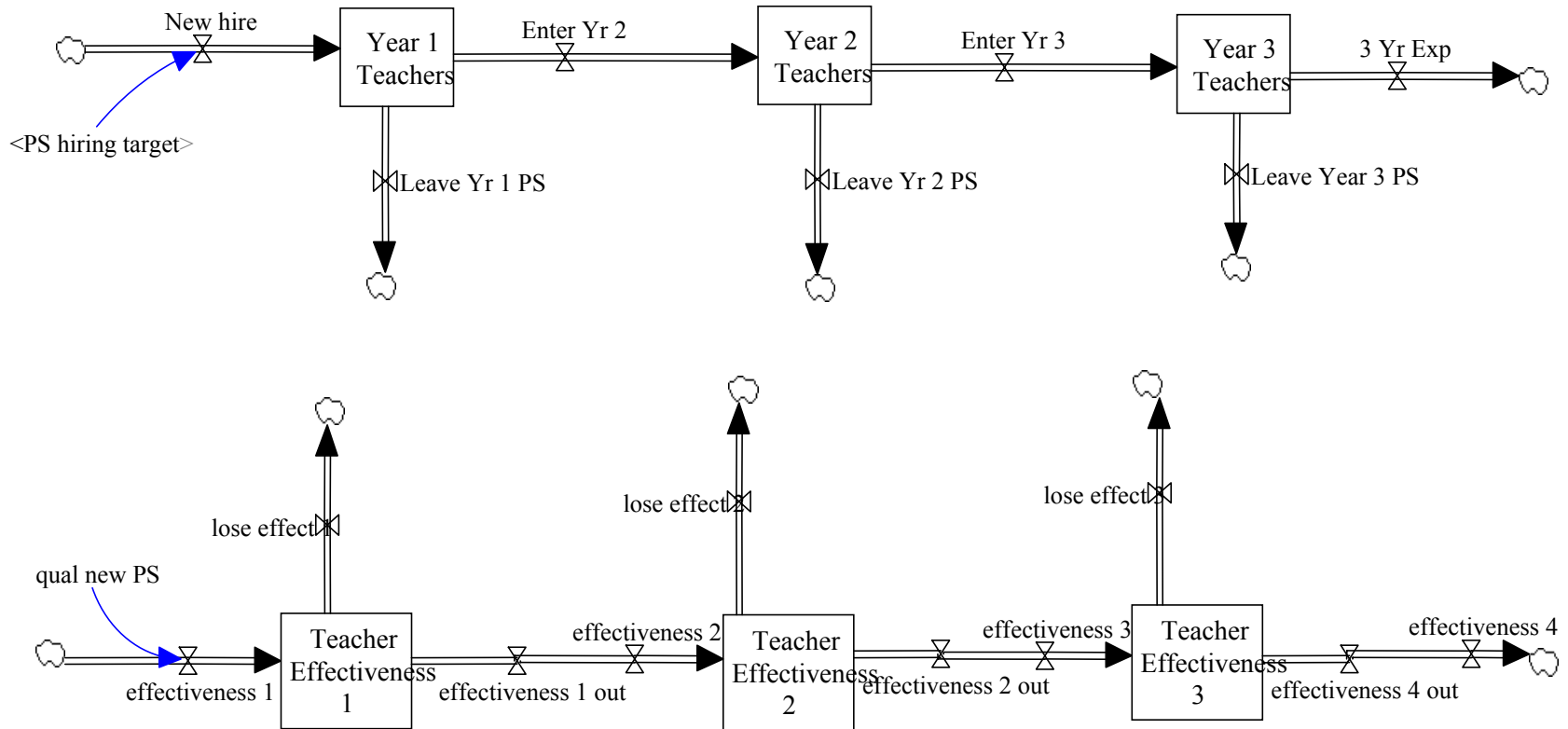
We are concurrently building:

- A statistical model to understand the relationship between compensation and working environment on teacher recruiting and retention;
- A second statistical model to examine the relationship between teacher characteristics and experiences and student achievement; and
- A systems-based model of a teacher aging chain and teaching effectiveness co-flow that uses values developed in the statistical models to improve understanding of the impact of resource allocation and policy decisions on building and maintaining a high quality workforce.

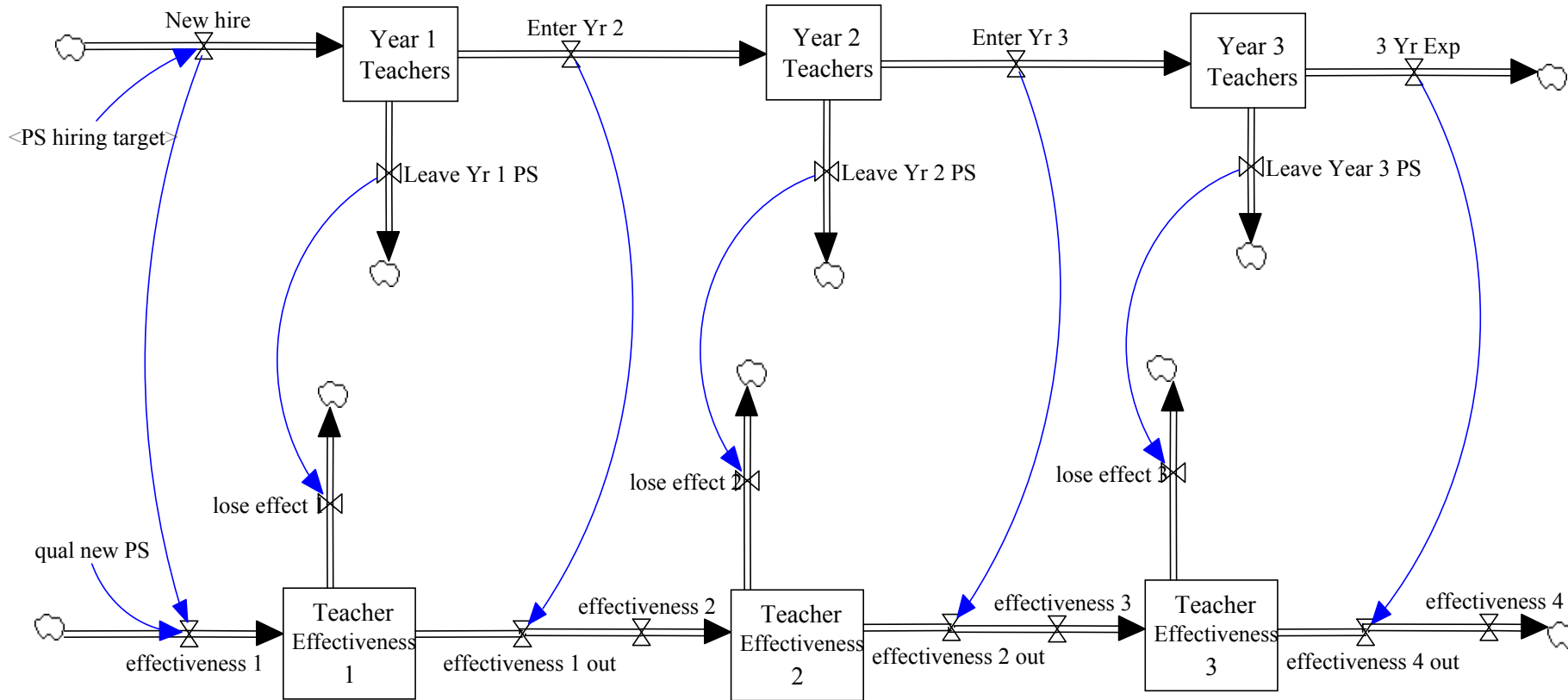
Dynamic Behavior of the System



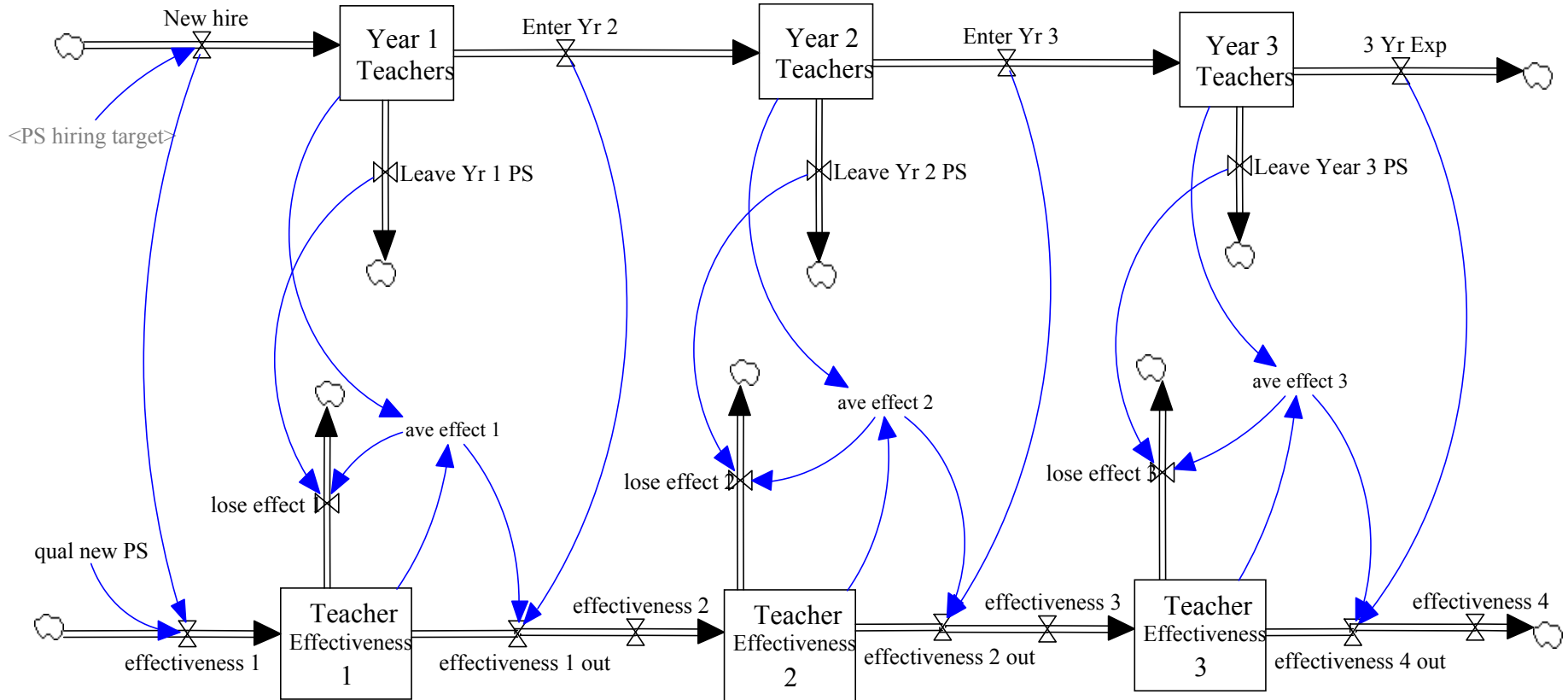
Length of Service/Effectiveness Co-flow: Part I



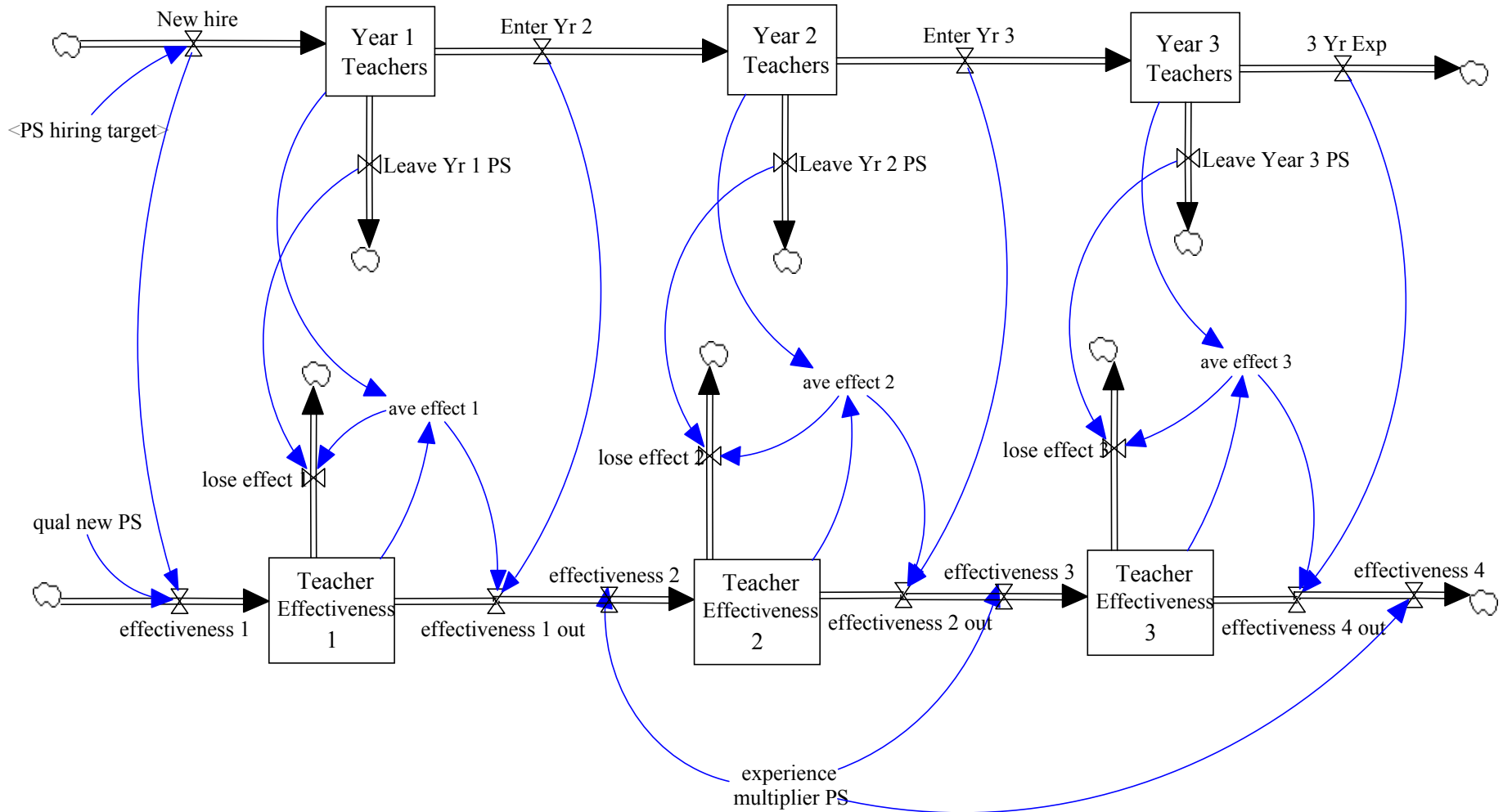
Length of Service/Effectiveness Co-flow: Part I



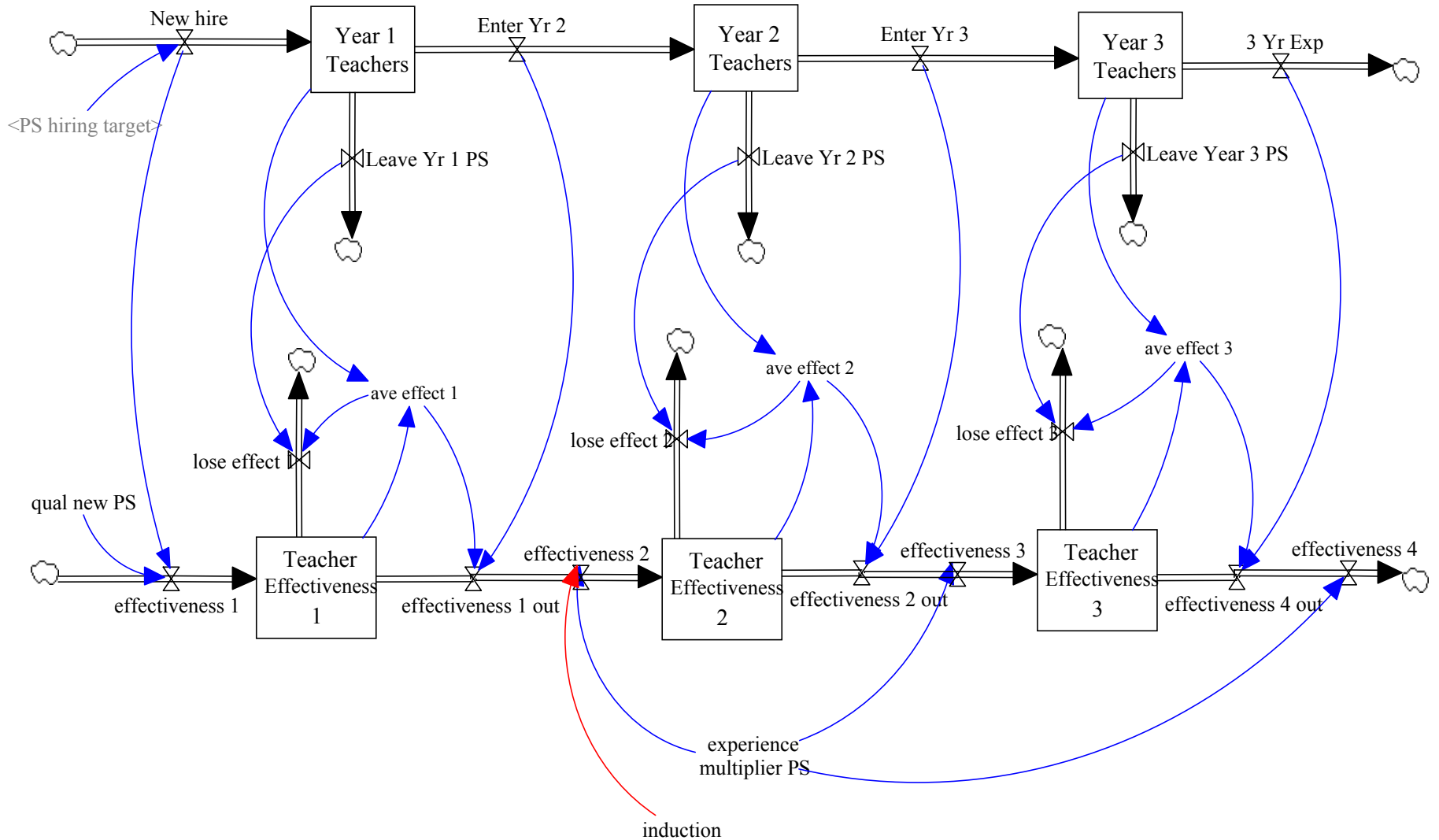
Length of Service/Effectiveness Co-flow: Part I



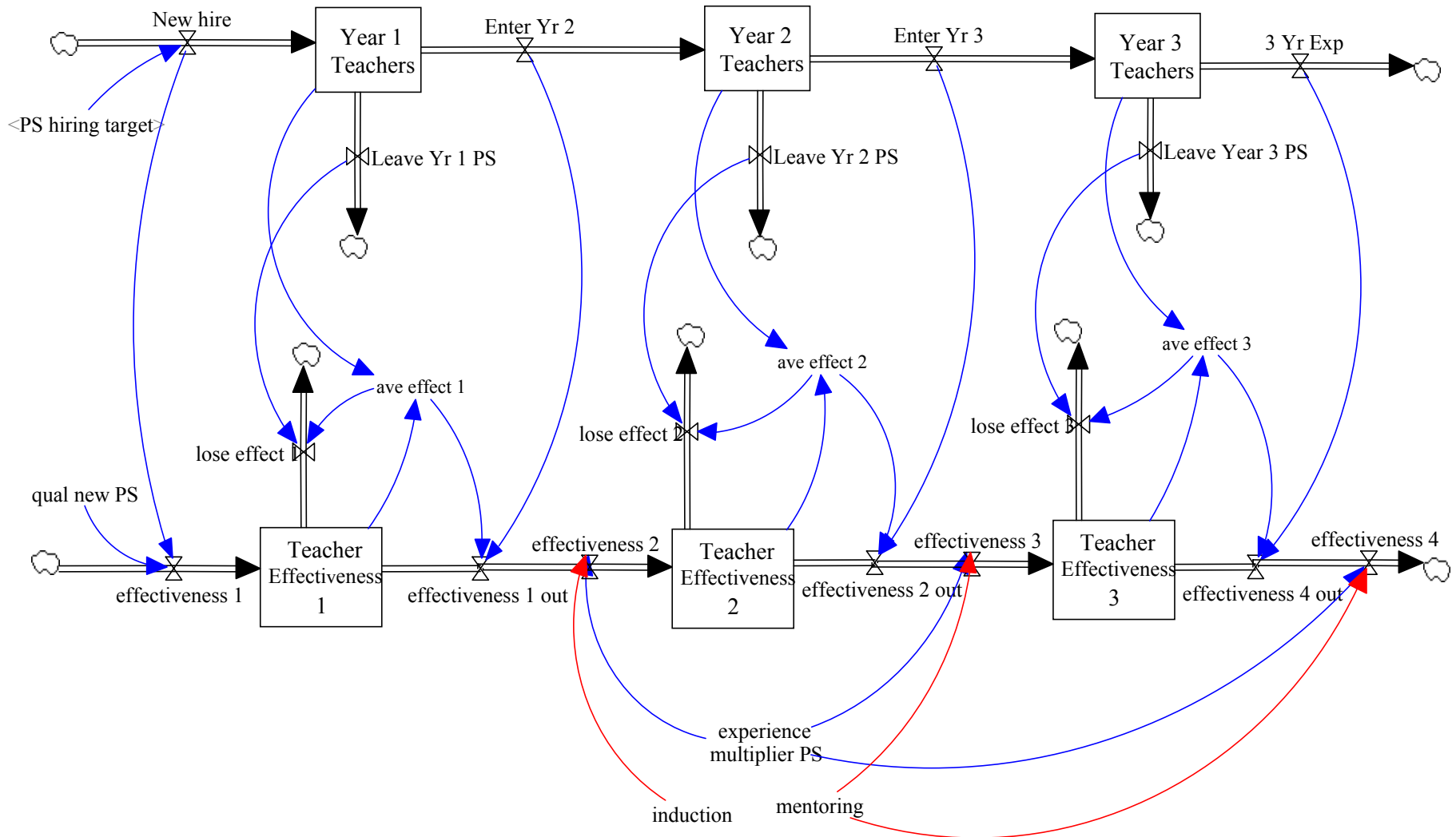
Length of Service/Effectiveness Co-flow: Part I



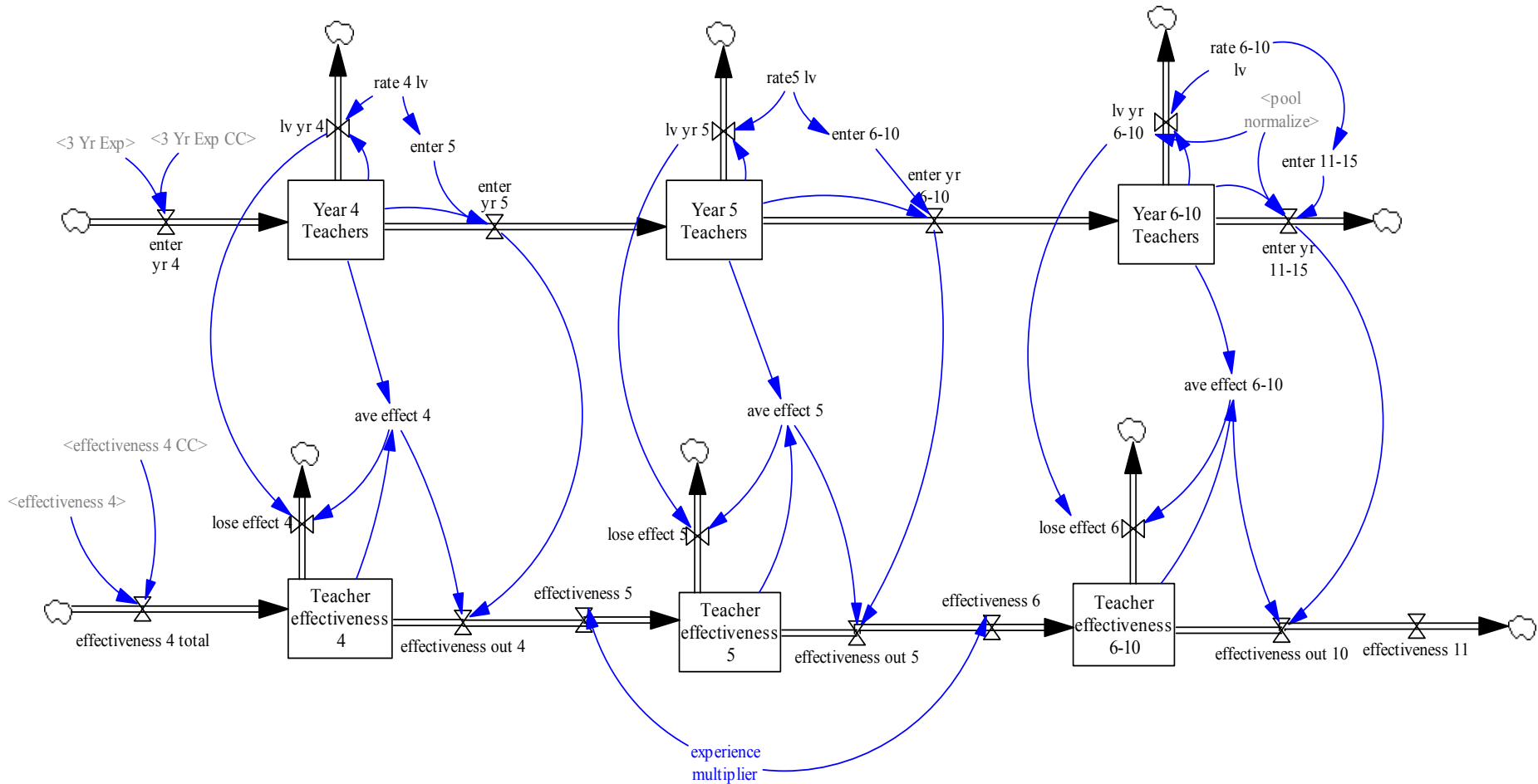
Length of Service/Effectiveness Co-flow: Part I



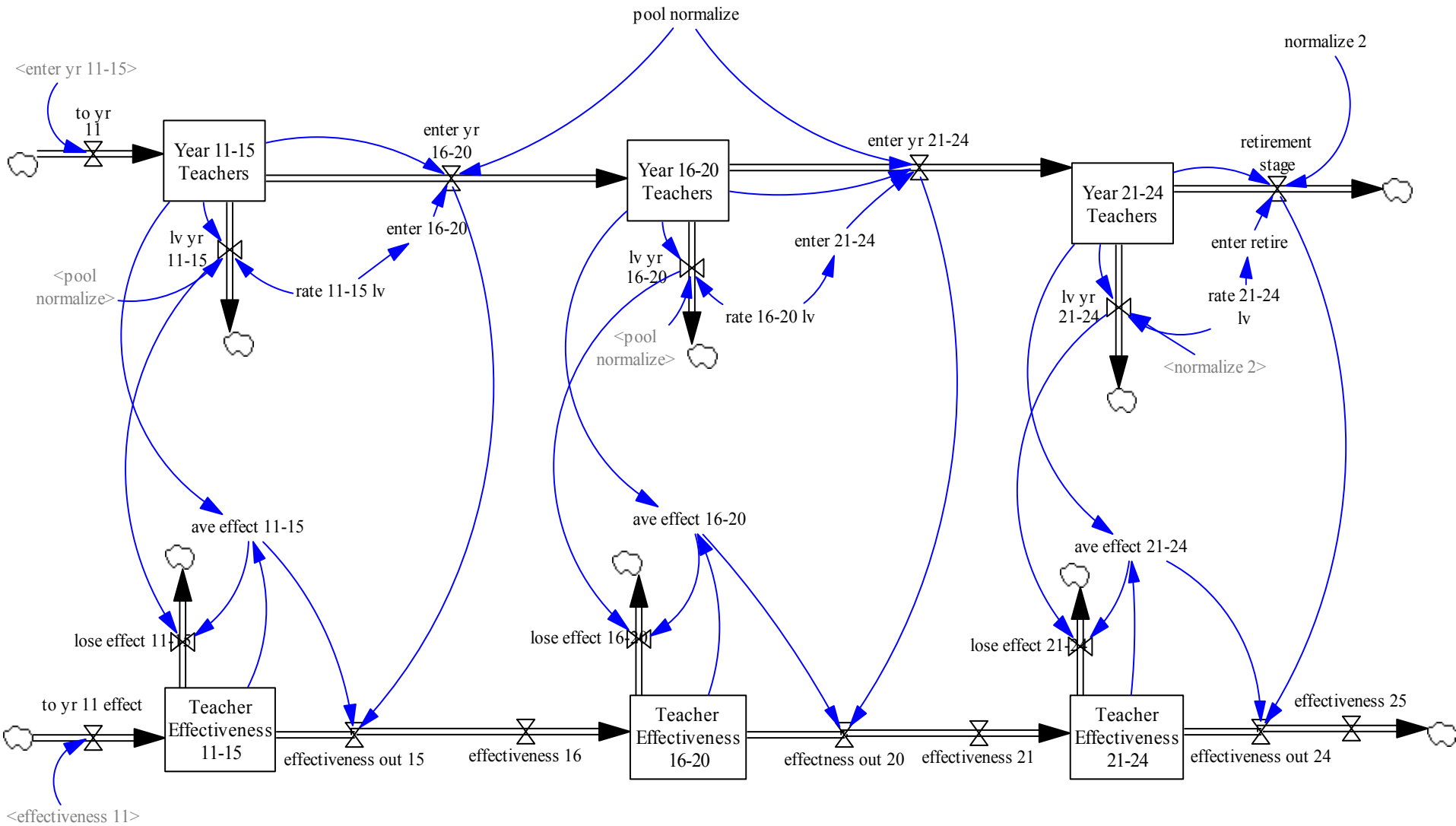
Length of Service/Effectiveness Co-flow: Part I



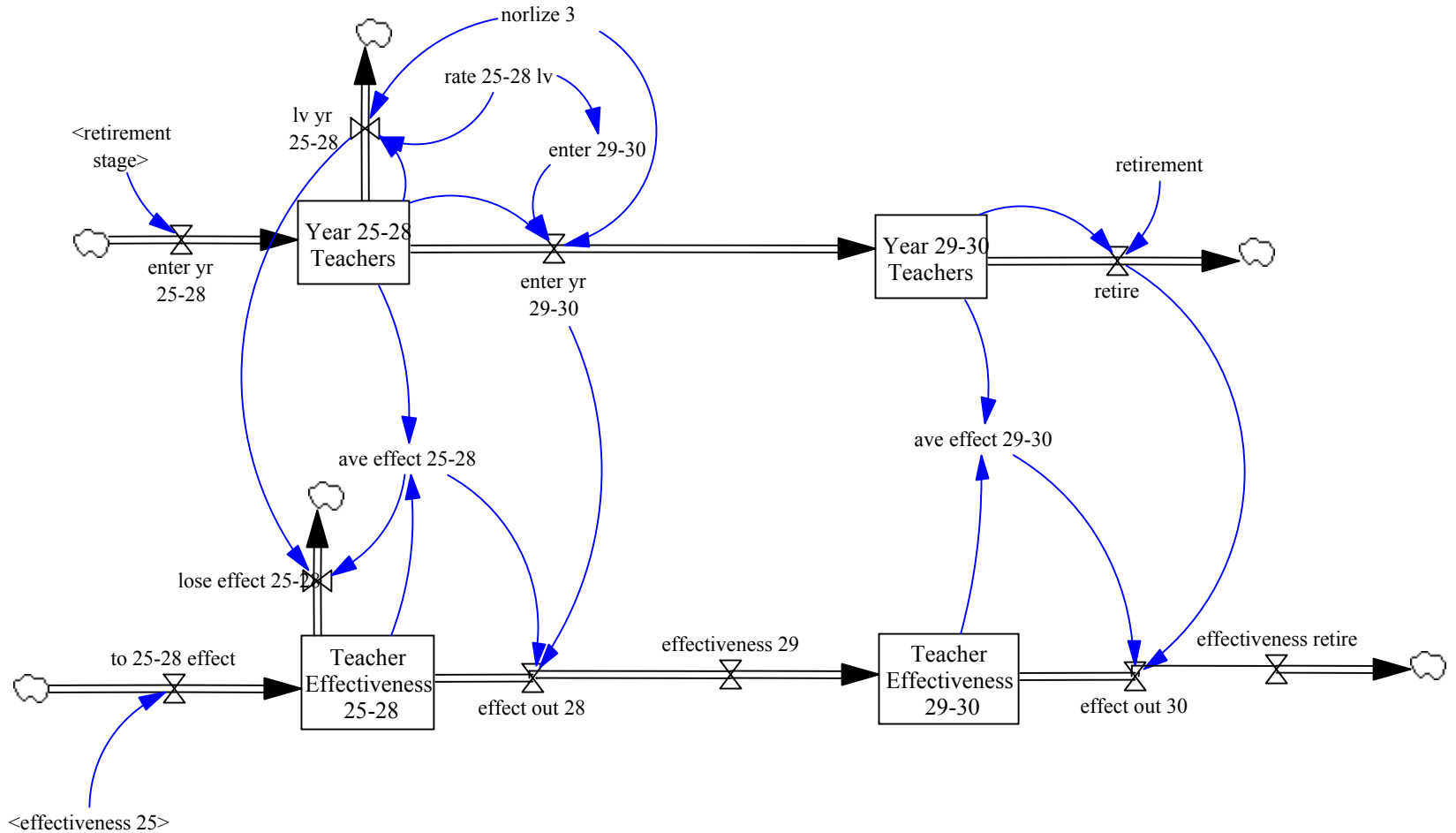
Years 4 – 10 Co-flow



Years 11 – 24 Co-flow



Years 25 – Retire Co-flow



Integrations

