Discussion of "The Sustainability of State and Local Government Pensions: A Public Finance Approach" by Lenney, Lutz, Scheule, and Sheiner (LLSS)

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Overview

- Paper studies sustainability of pension promises
- Goal is stabilization of pension debt to GDP
- Hard question: requires projections of annual pension fund cash flows and accruals in landscape of heterogeneous plan design
- Relies on modeling of new entrants into the system under current pension deals that new entrants receive
    - ➢ which in many cases are different from earlier tiers due to reforms

Main Comments

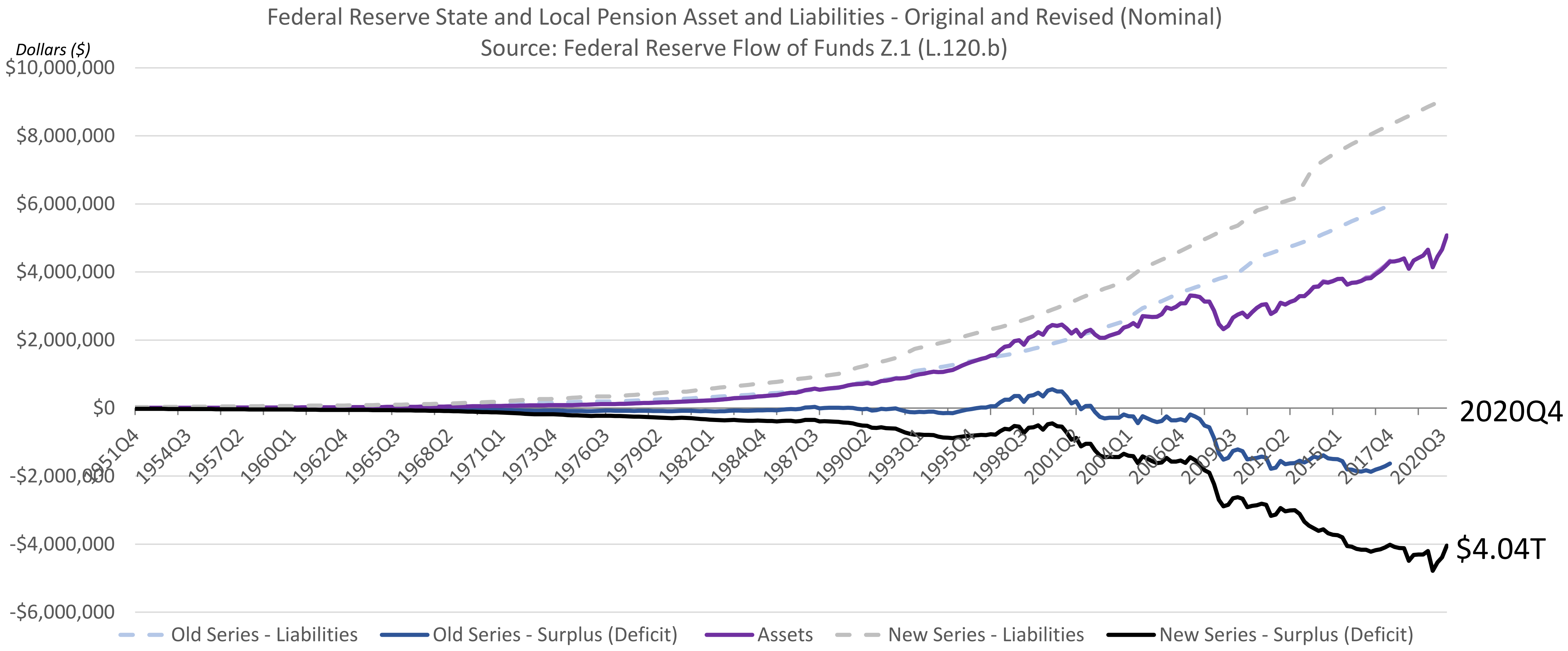
- Stabilization goal is reasonable to consider

- However, public sector's approach to funding with risk assets creates additional issues for this type of debt (unfunded pension liabilities) relative to government bonds

- Instability due to market risk isn't in the model, because the model is deterministic: no distribution of possible outcomes
  - ➢ Higher expected return you target, the greater the distribution of outcomes

- Only meaningful scenario is r=d=0% → fiscal adjustment is 14.9% of payroll vs. current 29%. So a **51%** increase.
  - ➢ I will provide some reasons I think this might still be too low

State and Local Pensions in the Federal Reserve Financial Accounts of the U.S. (1)



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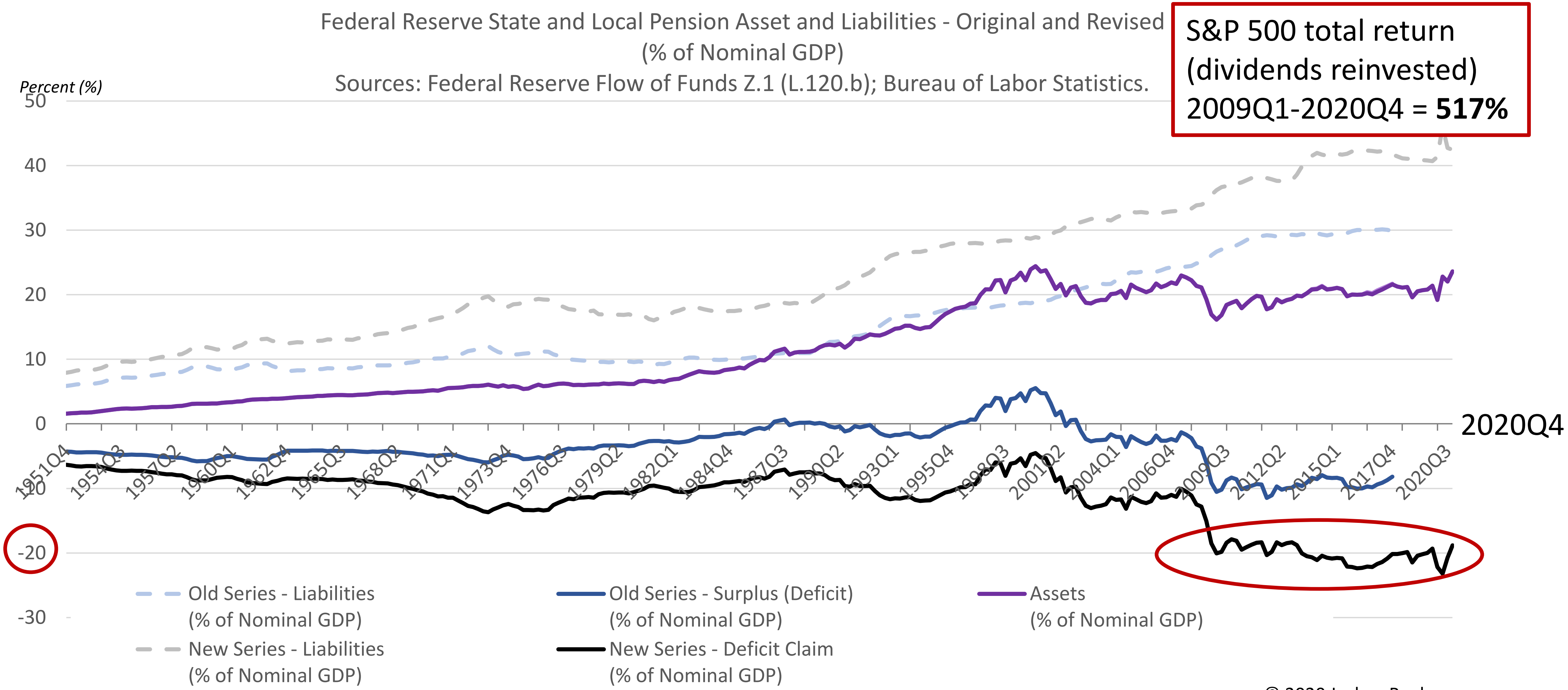
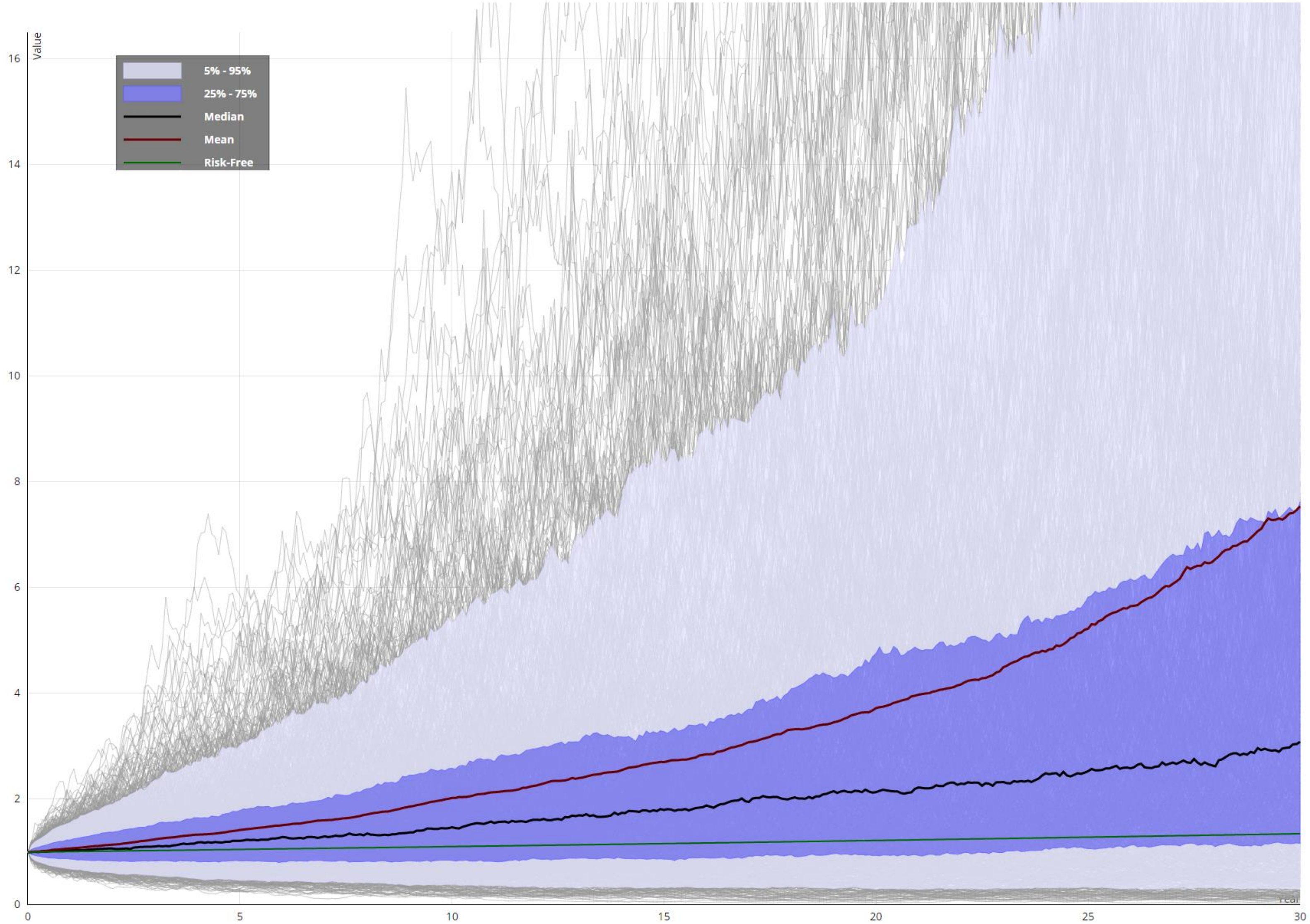
Ideas Defining A Free Society

State and Local Pensions in the Federal Reserve Financial Accounts of the U.S. (2)



Source: econgraphs.org/graphs/finance/capm/simulated_returns

Standard Finance Market Model: E[R]=7%, MRP=4%, β=1.5



Beta	1.5
Sigma	0.17
Risk-Free Return (RF)	1.0%
MRP	4.0%
Years (T)	30
Number of Draws	1,000
Y axis max	16.5

Get new shocks

Show all draws

After 30 years:	Dollar Value	Annualized Return
95th Pct.	$29.74	11.97%
75th Pct.	$7.62	7.00%
Mean	$7.54	6.97%
Median	$3.09	3.83%
25th Pct.	$1.16	0.51%
5th Pct.	$0.30	-3.96%

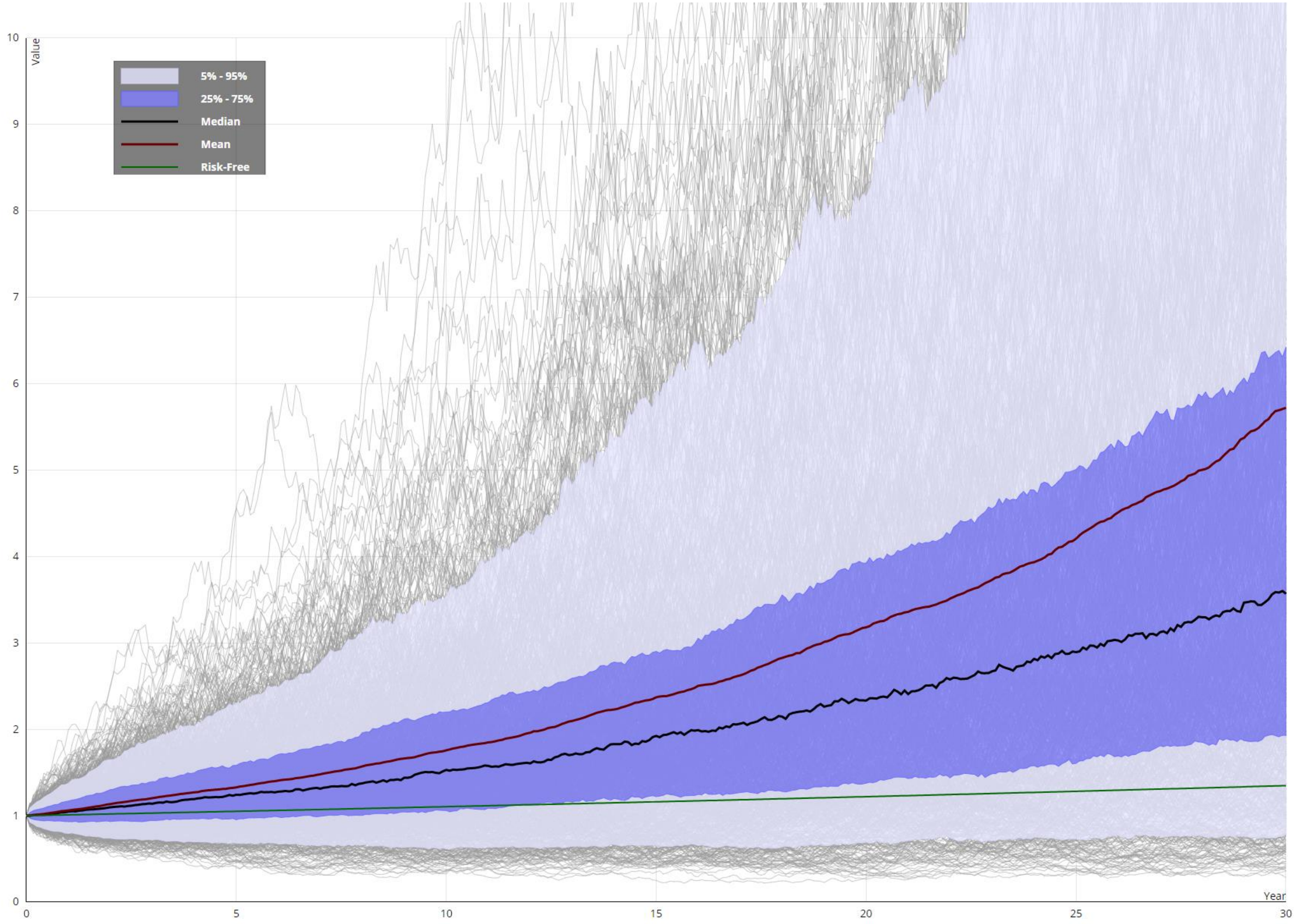
Black-Scholes-Merton assumptions: lognormal returns

$$S_T = S_0 e^{[R_T T]}$$

$$R_T \sim \phi\left(r + MRP - \frac{\sigma^2}{2}, \frac{\sigma}{\sqrt{T}}\right)$$

Source: econgraphs.org/graphs/finance/capm/simulated_returns

Standard Finance Market Model: E[R]=6%, MRP=5%, ß=1



Beta	1.0
Sigma	0.17
Risk-Free Return (RF)	1.0%
MRP	5.0%
Years (T)	30
Number of Draws	1,000
Y axis max	10.0

Get new shocks

Show all draws

After 30 years:	Dollar Value	Annualized Return
95th Pct.	$16.95	9.89%
75th Pct.	$6.42	6.39%
Mean	$5.72	5.99%
Median	$3.57	4.33%
25th Pct.	$1.93	2.21%
5th Pct.	$0.79	-0.80%

Black-Scholes-Merton assumptions: lognormal returns

$$S_T = S_0 e^{[R_T T]}$$

$$R_T \sim \phi\left(r + MRP - \frac{\sigma^2}{2}, \frac{\sigma}{\sqrt{T}}\right)$$

Implications of Modelling Stochastic Process Deterministically

- Agree that **d** and **r** can and should play distinct roles
  - **d** measures liability
  - **r** is determined by asset allocation
  - It may be optimal to fund less <100%, effectively borrowing to invest in risk assets, expose to distribution of outcomes with higher mean

- But what does it mean to separate **d** and **r** in a deterministic analysis?
- Costrell and McGee (2020) analyze steady state of this paper
  - Steady state contribution rate ultimately becomes independent of **d**

$$contributions = benefits - (r - g)\frac{a}{(1+g)} \qquad a \equiv \frac{Assets}{GDP}$$

  - Relying on earning above risk-free profits with certainty

Only meaningful Scenario: $r=d=r_f$

- Accounting definition of stability in level dollars: must pay
  - PV of new benefit accruals (“normal cost” or “NC”);
  - Plus interest on unfunded liability
- Rauh (2017) found **83% increase** in employer contributions necessary to cover these quantities as of 2017

- LLSS are looking for stability as share of nominal GDP, so benefit from **g**
- They find 14.9% of pay increase on 29% of pay baseline -> **51% increase**

	Increase in contribution rate required if changes are made (percent of payroll):			
Real rate of return	Start Today	Start In 10 years	Start In 20 years	Start In 30 years
0%	14.91%	12.71%	10.71%	8.82%

- But it is LOWER if you wait 30 years (8.82% of pay, or **30% increase**)

Comments About Adjustments

1. 15 plans (37.5% of plans) are insolvent before 30 years (Table 2)
   - Authors rely on idea that plans can issue debt to "smooth through the period of peak benefit outflows"
   - Add any volatility and there is a chance more could become insolvent

2. Waiting would stabilize the funding ratio at a much lower level
   - Still less costly as share of payroll because GDP higher and NCs much lower(?)
   - However, it again adds risk that due to volatility the plan becomes insolvent and must have big contribution increase to afford PAYGO

3. To really understand mechanics, need some more info:
   - NC at stated rate, t=0 and t=30
   - NC at risk-free rate, t=0 and t=30
   - Calculated PAYGO rate, t=0 and t=30
   - Funding ratio if start increasing contributions at t=0 vs t=30

Conclusions

- Interesting paper, asking good question and taking on difficult modeling
- Appreciate “public finance” goal of stabilization of pension debt/GDP
- But not advisable to ignore the “finance” insight of distributions of outcomes
- In talking about this paper, I will emphasize $r=d=r_f$ scenario until stochastic analysis is introduced
- Much potential to learn something from $r=d=r_f$, namely how much the new tiers have reduced necessary contribution increases