# The Role of Unionization in the Investment Management of State-Sponsored Public Pension Systems: A Hazard Model Approach

Hao Sun (Doctoral Candidate)

Rockefeller School of Public Affairs and Policy

University at Albany – SUNY

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# Overview

- Research Questions:
  - **Whether there is variation in the asset allocation among the investment portfolios of public retirement system?**
  - **If so, does unionization affect the timing of adjusting risk levels of investment portfolios (Increasing Risk Level of Investment Portfolio)?**
- Research Strategy:
  - Modern Portfolio Theory (MPT): Risk vs. Return of Pension Investment Portfolio
  - Perspective of Institutional Theory: “Right to Work” law and Public Retirement System
  - Cox proportional hazards model: evaluate the timing of adjusting asset allocation:
- Data in this Presentation:
  - The Public Plans Data
  - U.S. Bureau of Labor Statistics and National Right to Work Committee
  - Investment Return Data of Different Assets from Various Sources:
    equity, fixed income (domestic&international), real estate, cash and an alternative asset

# Literature Review

1. Modern Portfolio Theory (MPT) introduced by a Nobel prize laureate, Harry Markowitz.

   The statement: no added diversification can lower the risk for a given return level and vice versa (no additional returns can be gained for a given risk level).

***Steady Focus***

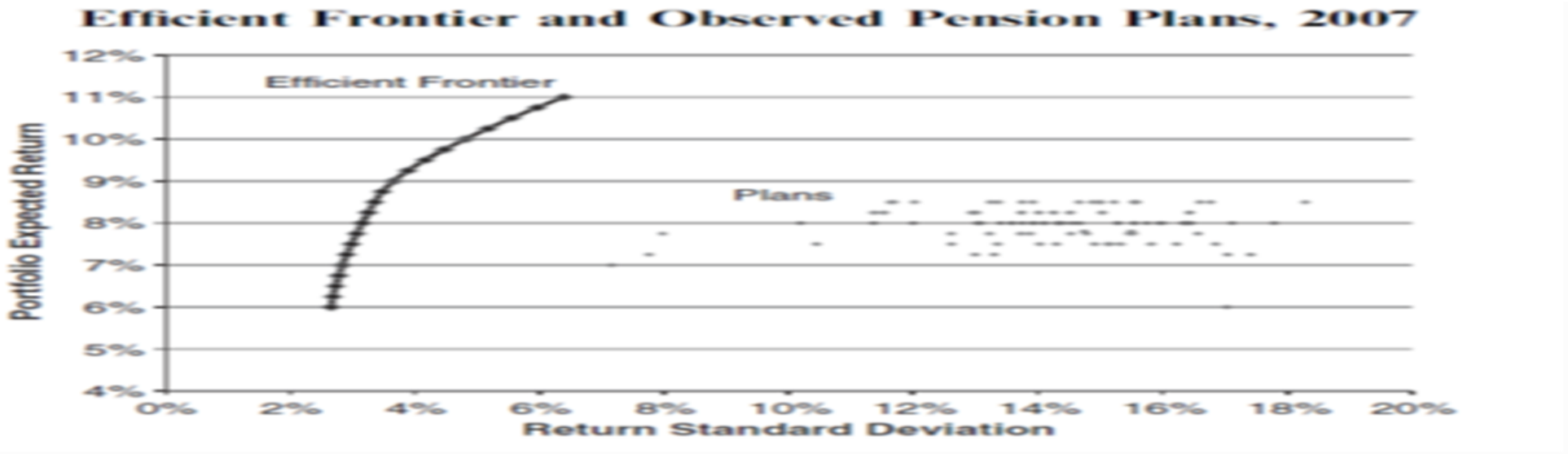


**Figure 1. Efficient Frontier of Previous Historical Data and only 2007 Observation[1]**

# Literature Review

*2. Unions and Investment Management :* ***Omitted-Variable Biases***

- **Upward Bias:** Funding Ratio (Mohan & Zhang, 2012)
- **Downward Bias:** Human Incentive Factors (Chen, Yao and Zhang, 2014)
- **Non-causal findings**: Asset Allocations (Lucas& Zeldes, 2009); Investment Strategies (Stalebrink, Kriz, and Guo, 2010)

# Literature Review

*3. Unions and Investment Management : **Incorrect Approach***

- **Perspective of institutional theory** is important (Chen, 2016; Coggburn & Reddick, 2007; Matkin et al., 2015; Schneider, 2005)
- Whether state law permits collective bargaining by state employees ("**Right to Work**") is particularly a critical factor influencing unions' behavior (Chaney et al., 2002; Mitchell & Smith, 1994).

# Literature Review

limitations in the literature :

1. ***Inappropriate Approach***: political economy model vs. institutional theory;

2. **Omitted-Variable Biases:** either upward or downward bias;

3. **Incorrect Focus**: Steady focus vs. Dynamic process-oriented focus.

# Why previous findings were not satisfactory ?

1. *Heavy focus on political economy model*
   - Try to understand the relationship without identifying the pathway
   - Perspective of Institutional theory (Matkin et al., 2015)

2. *Lack focus of major stakeholder*

3. *Lack a process-oriented focus*

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**Cox Proportional Hazard Model**

# Methodology

**Cox proportional hazard model** overcomes the three limitations :

1. ***Appropriate Model*** : institutional perspective is based upon the competing hazard ratios for institutional measurement “Right-to-Work” (RTW), relying on the institutionalization process of institutions (Tolbert & Zucker, 1996);

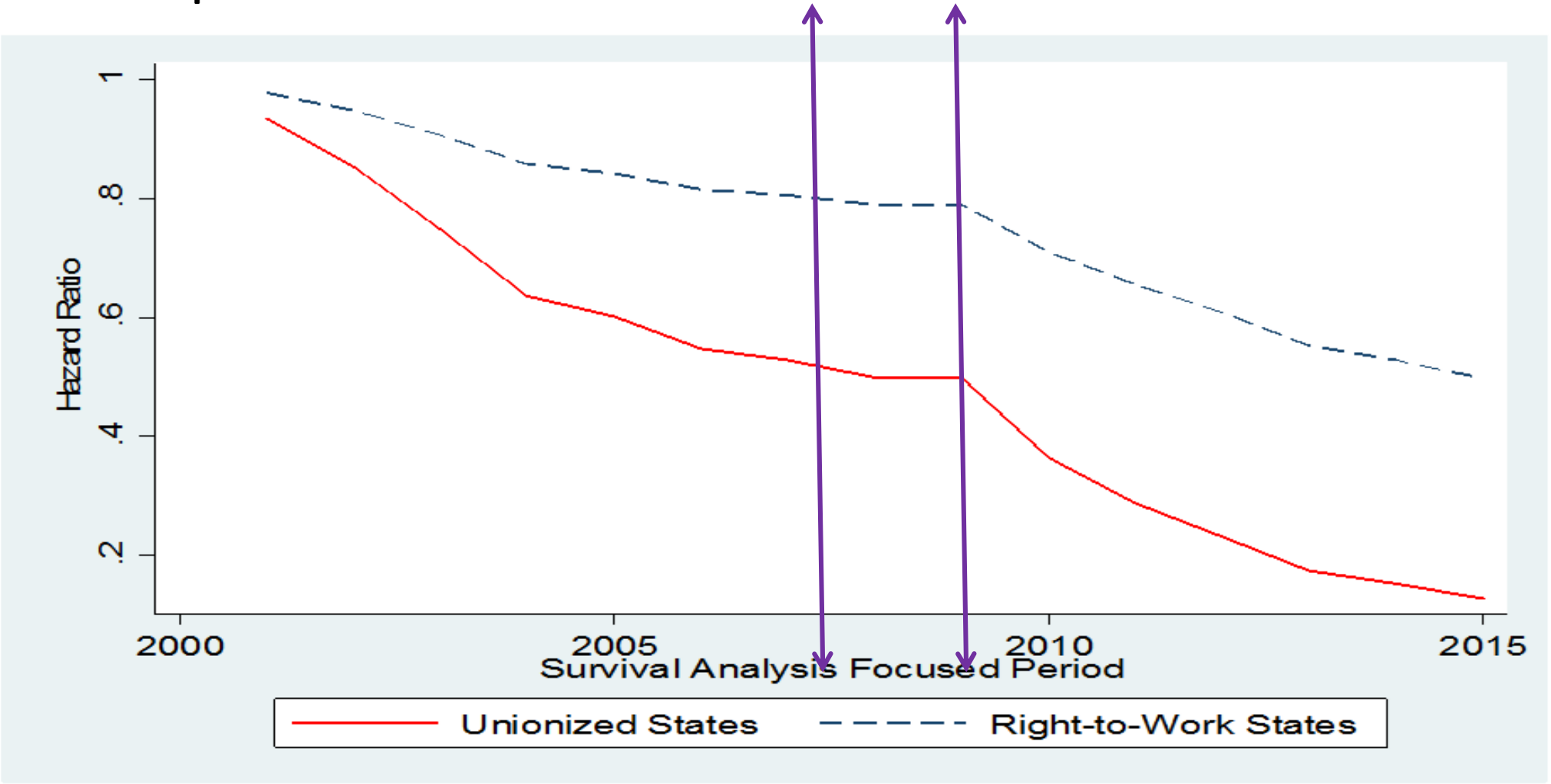
2. ***Role of Unions***: consider unions and institutional environment of the investment management studies;

3. ***Correct Focus***:

A. Nonlinear baseline hazard ratio;

B. Process-based understanding of investment managerial behavior examining the timing of adjusting risk level of public pension systems (Increasing Risk Level).

# Example: Figure 2. Unionized States Were Faster Decreasing Discount Rates



# The Result ….

# Research Questions

- Whether there is variation in the asset allocation practice of public retirement systems referring to the efficient frontier suggested by the Modern Portfolio Theory (MPT)?

- If so, how will unionization affect the timing of adjusting risk levels of investment portfolios (Increasing Risk )?
  - **Increase the risk level of investment portfolios**

# Research Question 1: Efficient Frontier and Observed Pension Plans 2001 -2016 – *VARY*

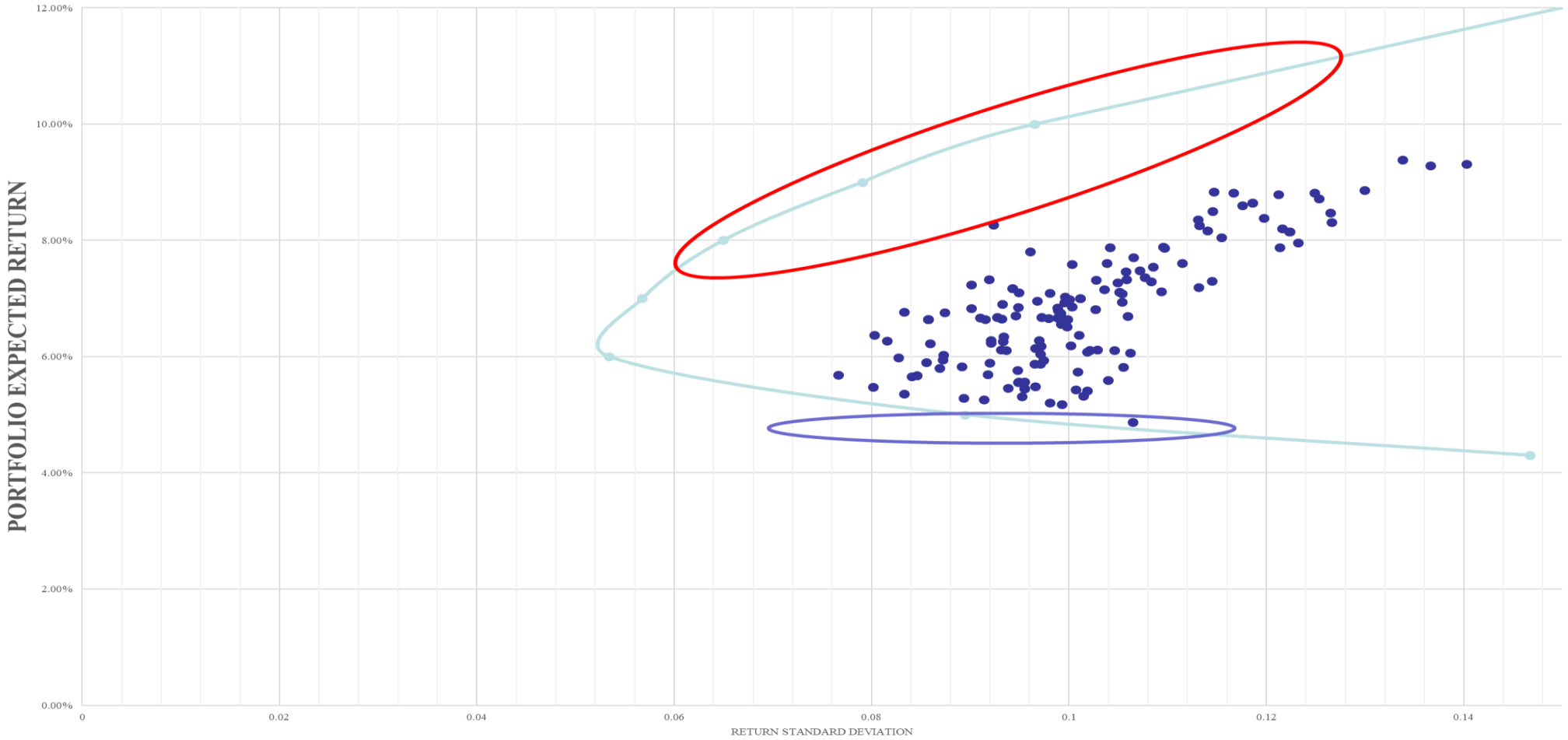
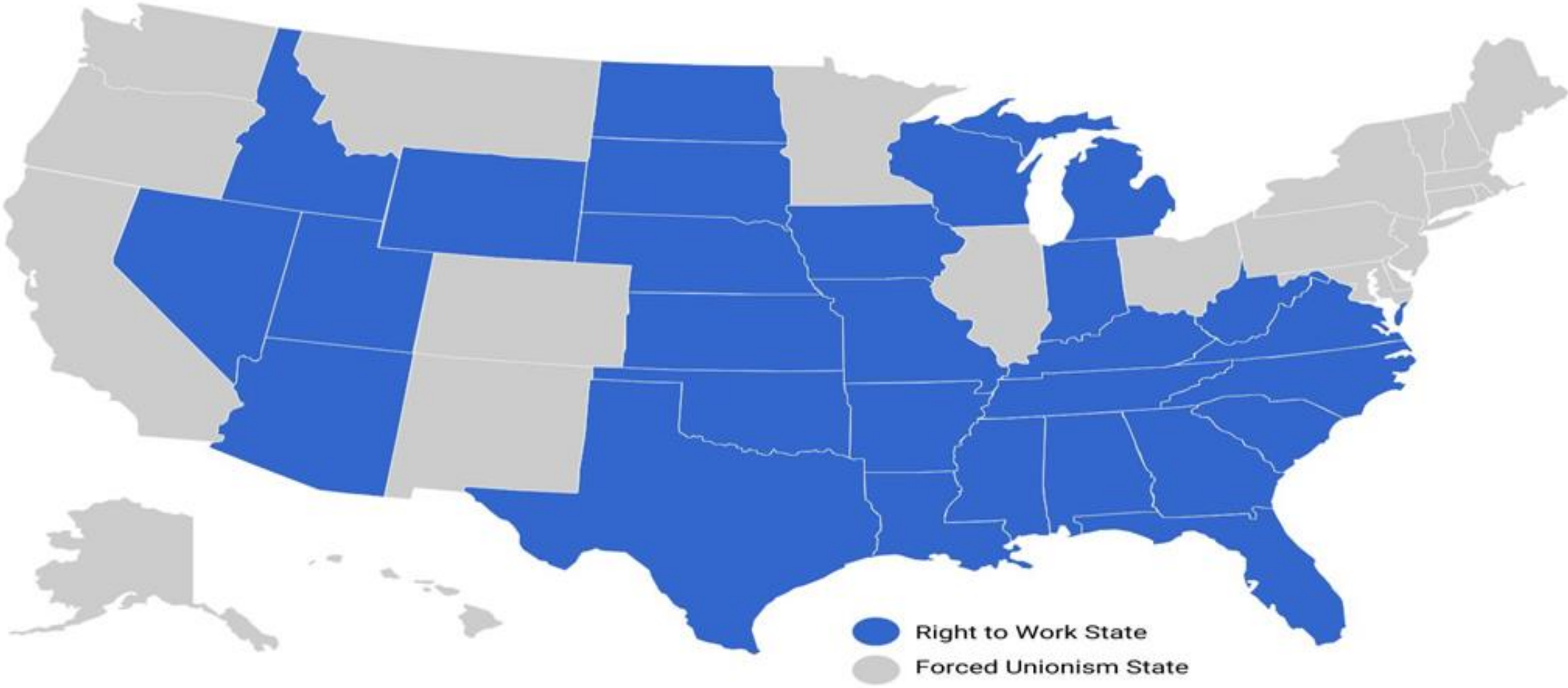



**Figure 3. Efficient Frontier with PPD 2001 - 2016**

# Figure 4. Quoted from 2017 the National Right to Work Committee

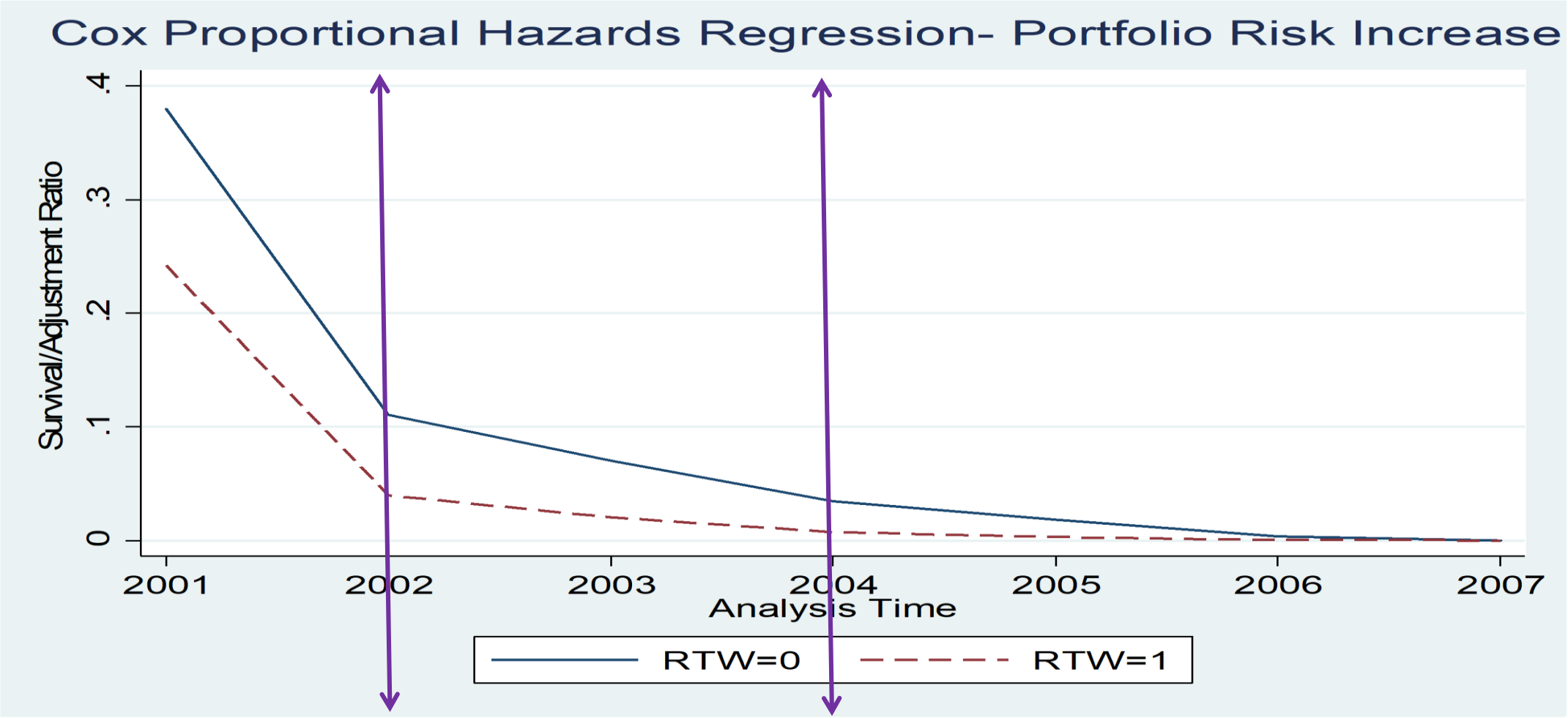


# Hypothesis of Research Question 2

Unionized states are slower to adopt changes that reduce financial sustainability of pension systems, thus

- Slower to increase risk level of investment portfolio;
- The risk level here is the difference between real risk and expected risk in MPT.

# Figure 5. Competing Hazard Ratios Unionized States vs. Right-to-Work States




**Unionized States were more conservative while Right-to-Work states were faster increasing to higher risk level**

# Summary

- This project explores and examines the role of public employee unions and investment management process:
  - There is variation in the asset allocation of investment portfolios
  - The timing of adjusting investment risk level of public retirement system also varies

- Institutional perspective (**RTW**) is significant in the investment management process;
  - **Slower when compatible (Unionized States)**
  - **Faster when conflicting ("RTW" States) ?**

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State University of New York

**Thank you and Questions?**

# Appendices (Fixed Effects vs. Survival Analysis)

| VARIABLES | (1) | (2) |
|---|---|---|
| | **Risk Ratio** | **Risk Ratio Increase** |
| | **Fixed Effects** | **Perfect SA** |
| **Pension Plan Sizes (Lg Assets_Value)** | 0.0125 | -0.00517 |
| | (0.0212) | (0.0715) |
| **Financial Sustainability (Active Member%)** | **-1.368*** ** | -0.286 |
| | (0.246) | (0.842) |
| **Finiancial Condition (ActFundedRatio%)** | -0.188 | -0.129 |
| | (0.141) | (0.477) |
| **Finiancial Discipline (Contribution paid%)** | 0.0105 | 0.161 |
| | (0.0415) | (0.221) |
| **Investment Strategy (Equities%)** | **-1.105*** ** | -0.632 |
| | (0.210) | (0.843) |
| **InvestmentReturn(1yr)** | **-2.404*** ** | -0.770 |
| | (0.190) | (0.776) |
| **EmployerType** | -0.0170 | -0.106 |
| | (0.0630) | (0.203) |
| **Union Density (Coverage %)** | **0.0249*** | 0.0816 |
| | (0.0133) | (0.0534) |
| **Union Density (Member %)** | -0.0133 | -0.0657 |
| | (0.0131) | (0.0510) |
| **Right to Work** | **0.664*** ** | **0.941** ** |
| | (0.123) | (0.476) |
| **Union Density (Member %) * Right to Work** | **-0.0150*** ** | -0.0215 |
| | (0.00405) | (0.0152) |
| **Observations** | 1870 | 406 |
| **R-squared** | 0.105 | |
| **Plan Fixed effects** | Yes | |
| Standard errors in parentheses | *** p<0.01, ** p<0.05, * p<0.1 | |

# Appendices

1. Equity Return: The Closing Price of S&P 500 (^GSPC) SNP - SNP Real Time Price (in USD). Data source: Yahoo Finance https://finance.yahoo.com/quote/%5EGSPC?p=%5EGSPC
2. Fixed Income Domestic Return: The BofA Merrill Lynch US Corporate Master Index value, which tracks the performance of US dollar denominated investment grade rated corporate debt publicly issued in the US domestic market.
   Data source: FRED Graph Observations Federal Reserve Economic Data https://fred.stlouisfed.org/series/BAMLCC0A0CMTRIV
3. Fixed Income International Return: The BofA Merrill Lynch Emerging Markets Corporate Plus Index tracks the performance of US dollar (USD) and Euro denominated emerging markets non-sovereign debt publicly issued within the major domestic and Eurobond markets.
   Data source: FRED Graph Observations Federal Reserve Economic Data https://fred.stlouisfed.org/series/BAMLEMCBPITRIV
4. Real Estate return: Wilshire US Real Estate Securities Total Market Index (Wilshire US RESI) Data source: FRED Graph Observations Federal Reserve Economic Data https://fred.stlouisfed.org/series/WILLRESIND
5. Cash 3-Month Treasury Bill: Secondary Market Rate Data source: FRED Graph Observations Federal Reserve Economic Data https://fred.stlouisfed.org/series/TB3MS
6. Alternative asset:
   a. Barclay Hedge Fund Index Historical Data: The Barclay Hedge Fund Index is a measure of the average return of all hedge funds (excepting Funds of Funds) in the Barclay database. Data source: Barclay https://www.barclayhedge.com/research/indices/ghs/Hedge_Fund_Index.html b. S&P GSCI
   b. Commodity Index Spot Level: The S&P GSCI is the first major investable commodity index. It is one of the most widely recognized benchmarks that is broad-based and production weighted to represent the global commodity market beta. Data source: YCharts https://ycharts.com/indices/%5EGNX/level

# Appendices **Asset Allocation (PPD 2001-2016 173 Plans)**

| | |
|---|---|
| ">0.99", "<1.01" | 2415 |
| ">0.98", "<1.02" | 2444 |
| ">0.95", "<1.05" | 2457 |
| ">0.90", "<1.10" | 2477 |
| **Total** | **2720** |

# Appendices **Years Right-to-Work Legislation Enacted (2001 to 2017)**

| State | Year Enacted |
|---|---|
| Arkansas | 1944 |
| Arizona | 1946 |
| Nebraska | 1946 |
| South Dakota | 1946 |
| Georgia | 1947 |
| Iowa | 1947 |
| North Carolina | 1947 |
| Tennessee | 1947 |
| Virginia | 1947 |
| North Dakota | 1948 |
| Nevada | 1952 |
| Alabama | 1953 |
| South Carolina | 1954 |
| Utah | 1955 |
| Kansas | 1958 |
| Mississippi | 1960 |
| Wyoming | 1963 |
| Florida | 1968 |
| Louisiana | 1976 |
| Idaho | 1986 |
| Texas | 1993 |
| Oklahoma | 2001 |
| Indiana | 2012 |
| Michigan | 2012 |
| Wisconsin | 2015 |
| West Virginia | 2016 |
| Kentucky | 2017 |
| Missouri | 2017 |