

WHICH BANANA PIECE COULD BE YOUR RETIREMENT NEST EGG?

April 2014



Rodrigo Silva
Principal

Mercer Colombia

General Framework

1

Money is **financially** accrued but **actuarially** spent

Affiliates are exposed to **risk**

Communicate all of the above

Communicate

2



What is Risk?

3

www.thefreedictionary.com

- Risk is the possibility you'll lose money if an investment you make provides a disappointing return.

What is Risk?



Plain Model: Assumptions

5

The affiliate saves **all the time**

No administrative **fees**

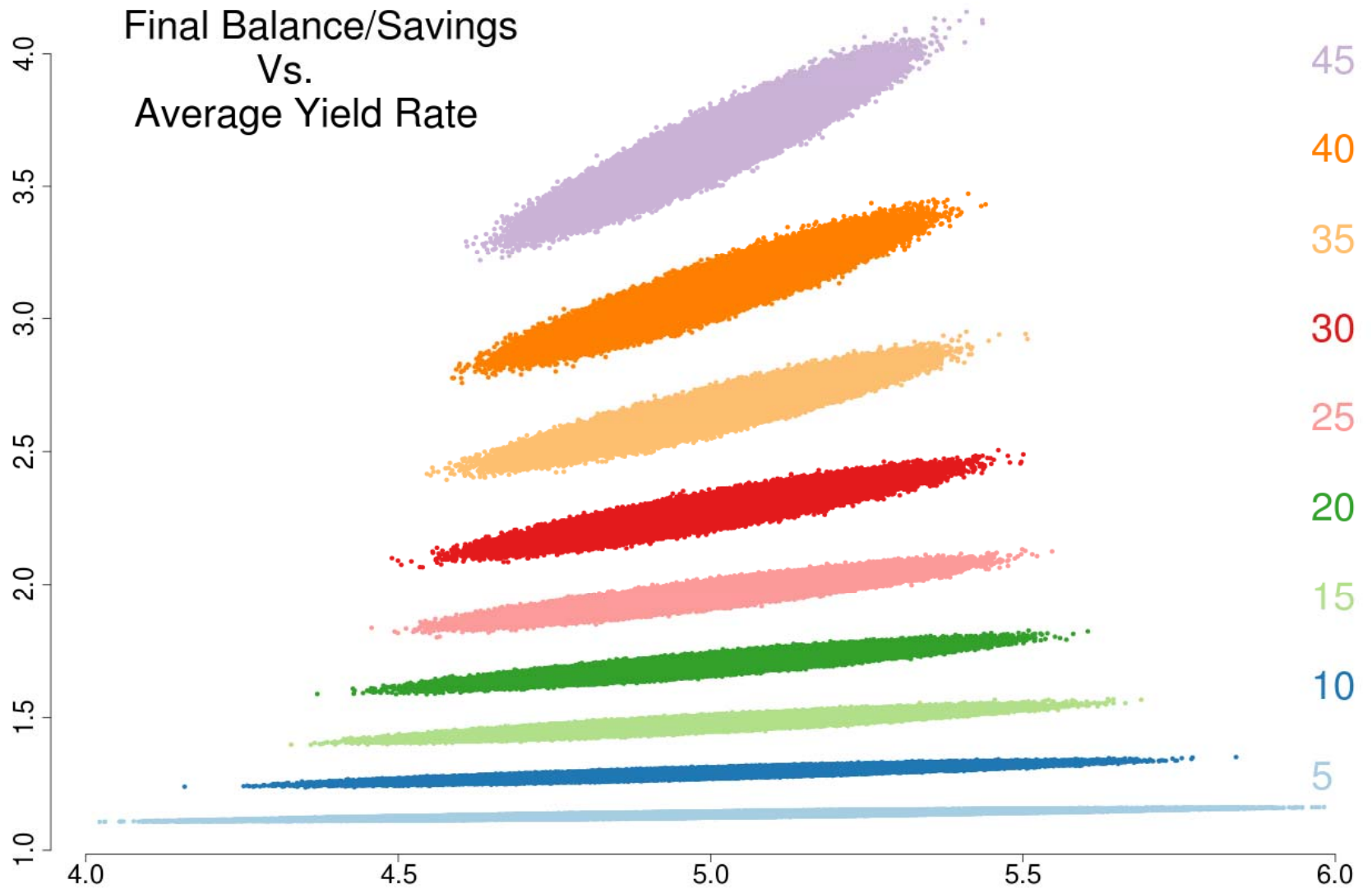
Fixed interest rate for every year

Independent rates for each other
year

Constant currency

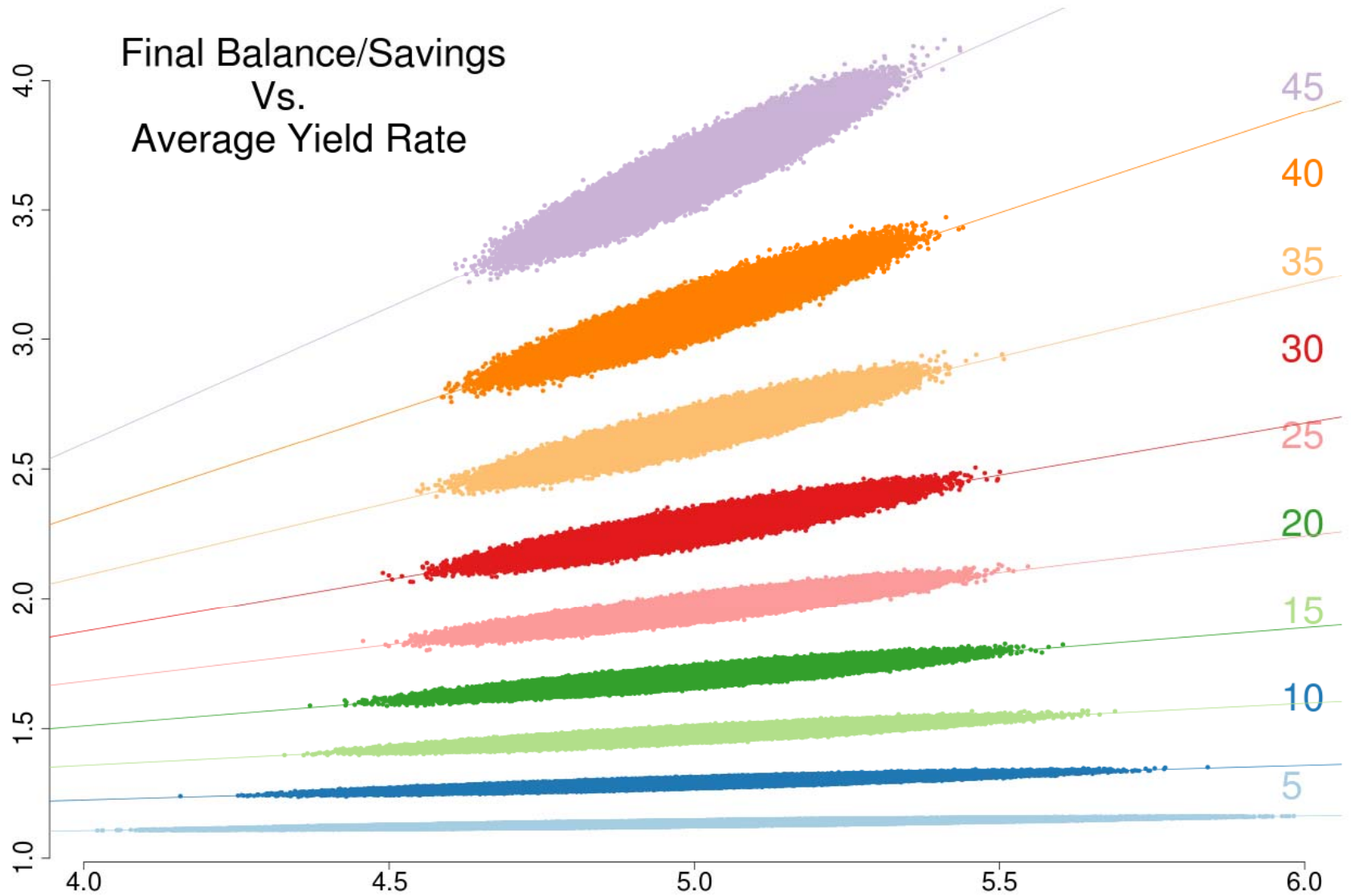
Plain Model: Results

6



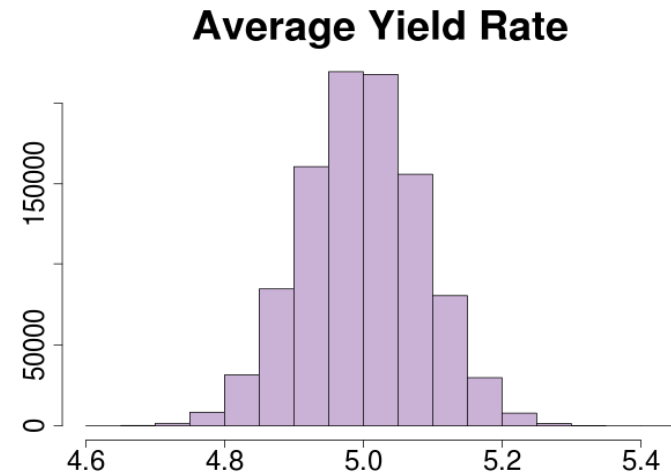
Plain Model: Results

7



Plain Model: Results

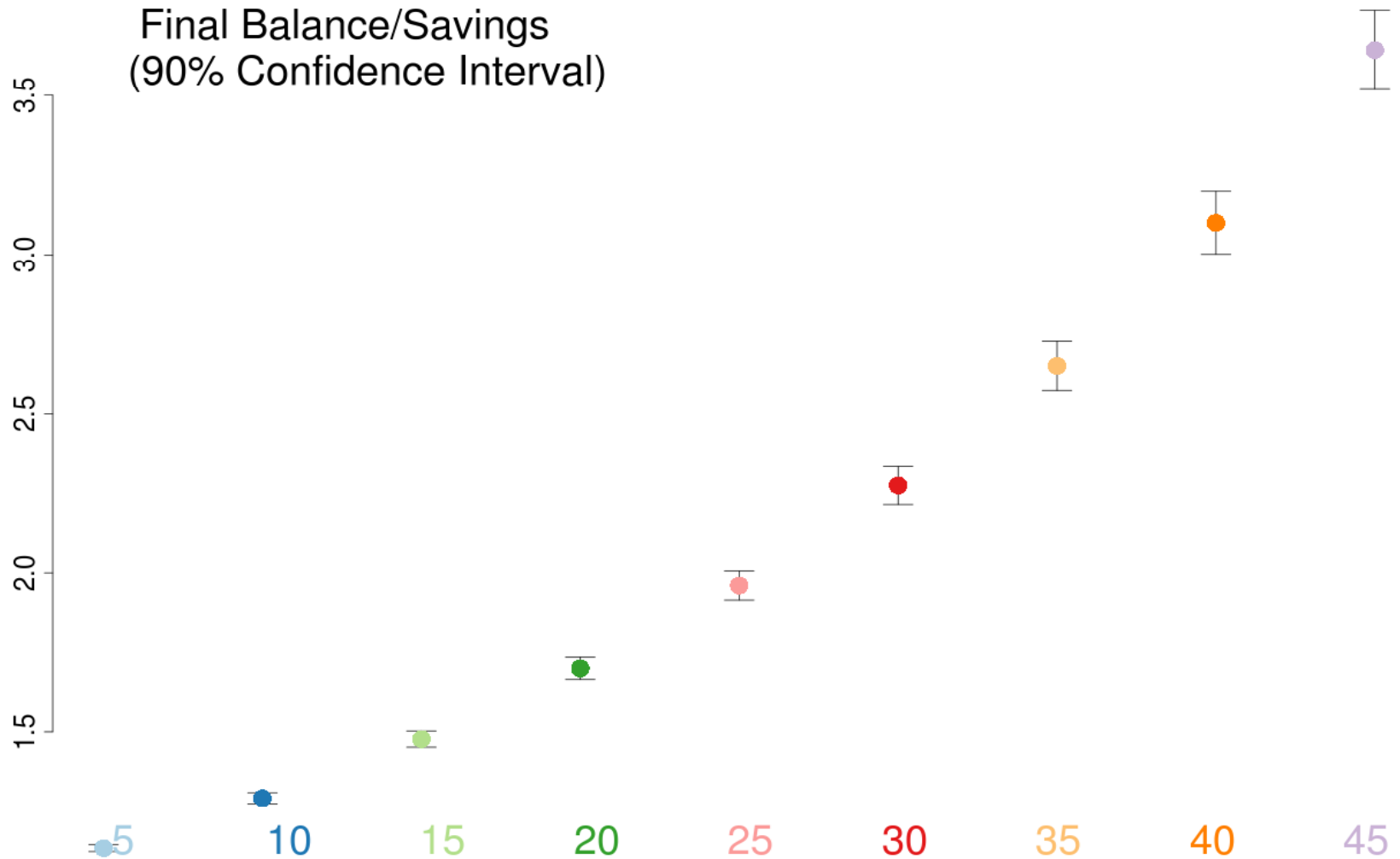
8



Uniform distributed rates
interest gives **normal results**

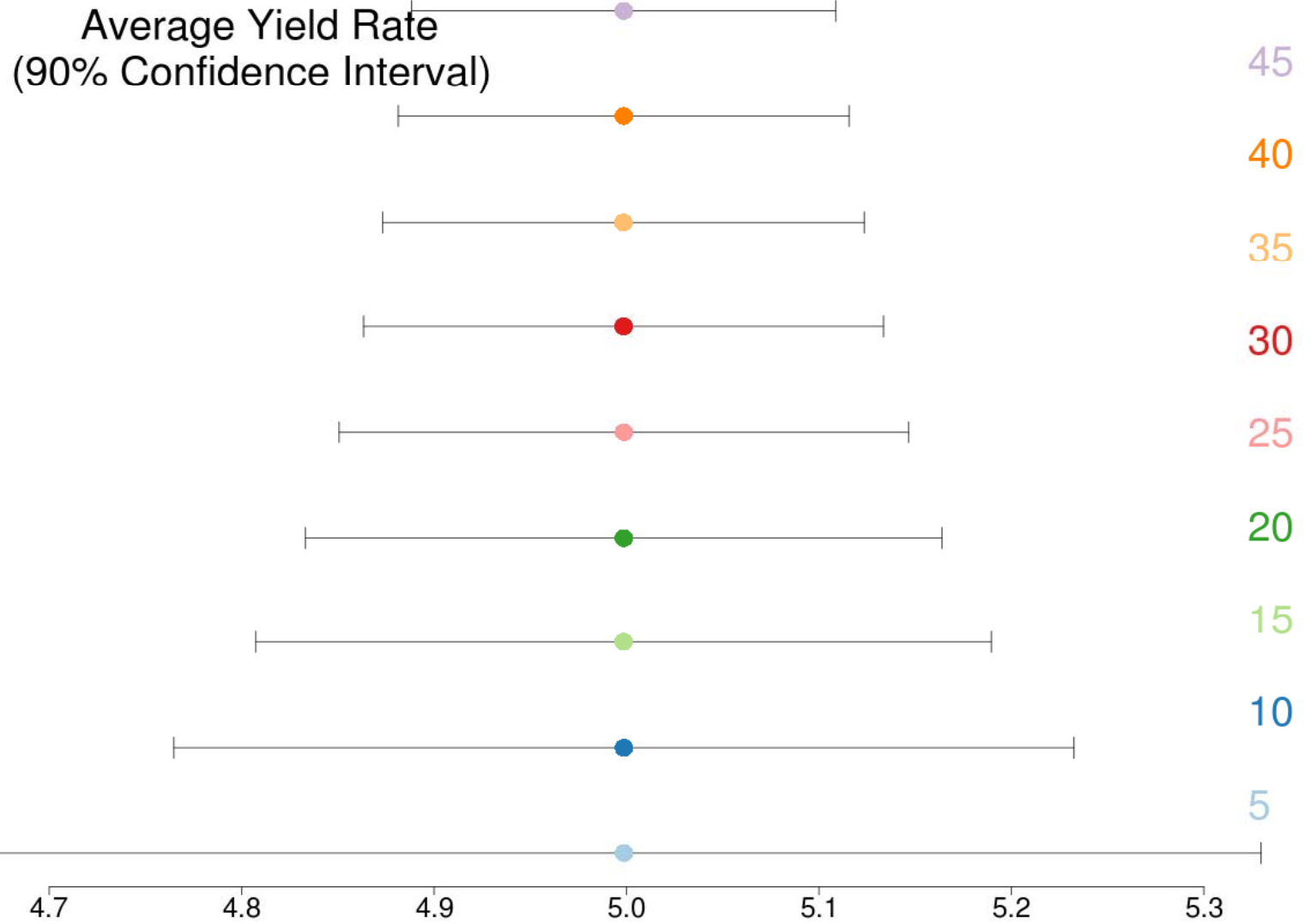
Plain Model: Results

9



Plain Model: Results

10



Plain Model: Conclusions

11

With the same **average rate**, different **balances** are obtained

The same **balance** can be obtained with different **rates**

Short term processes are **not** rate sensitive

More saving future time means more **centered** processes

Assumptions for Colombia

12

Nominal rates obtained from **historical** rates for one of the AFPs

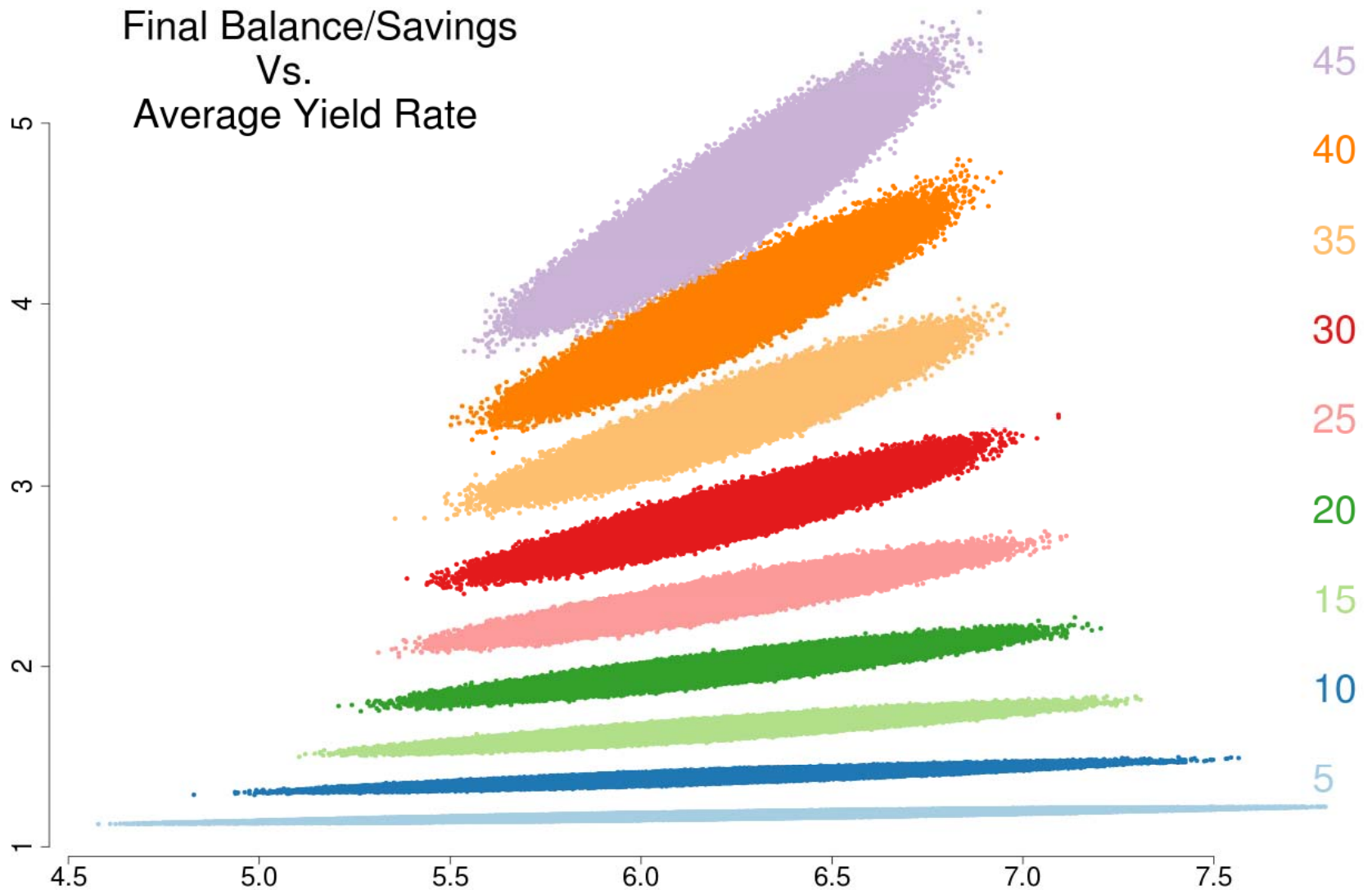
Real rate of $6.22\% \pm 1.72\%$, **UUD**

Salary **grows** according to a “National Average Salary”

Retirement age is 62|57 for men, 40 years saving means they engage in the system since 22|17

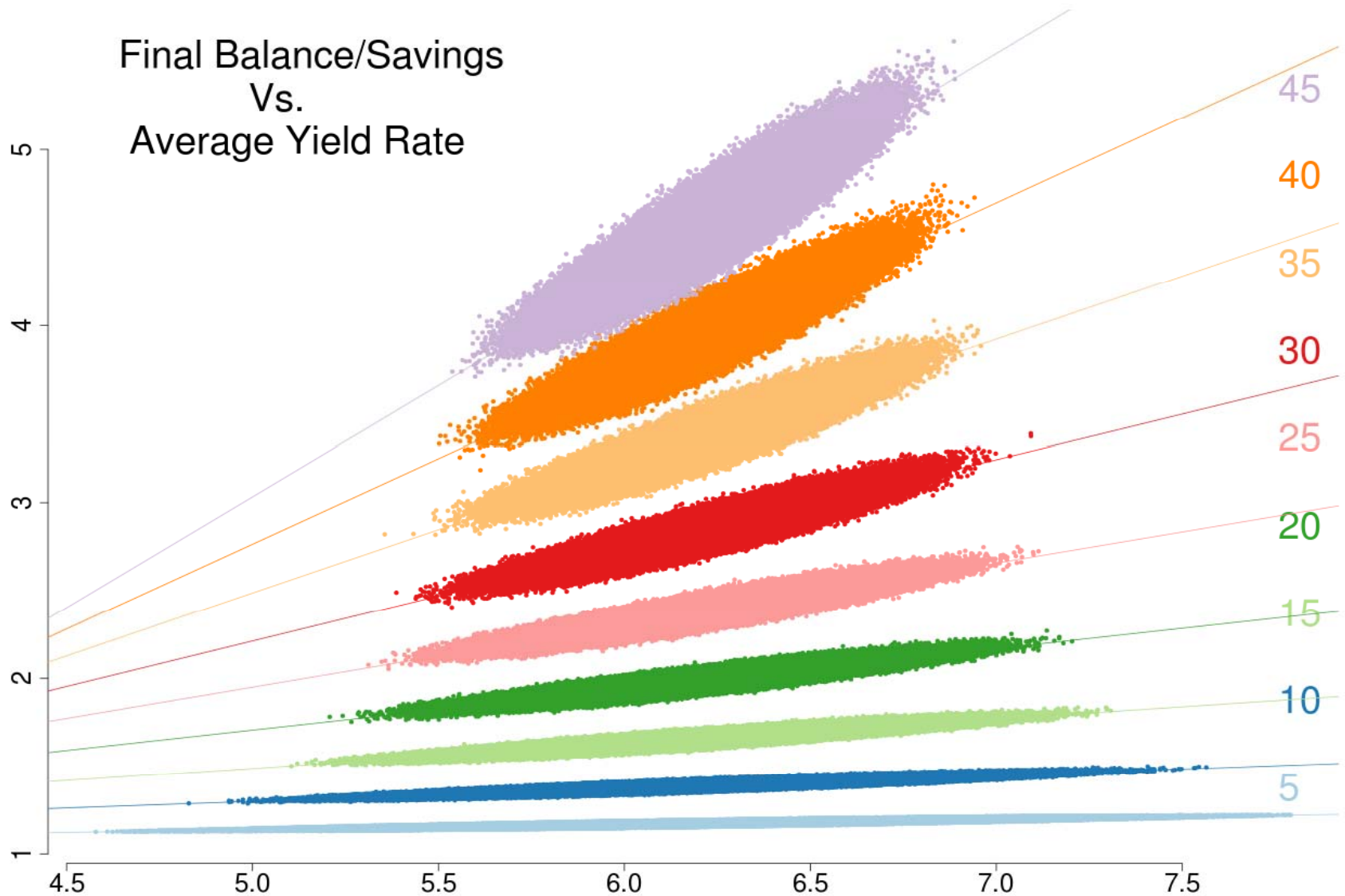
Model for Colombia: Results

13



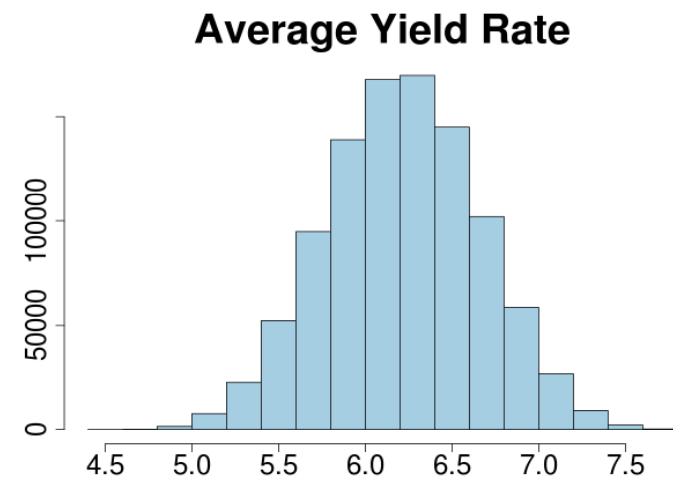
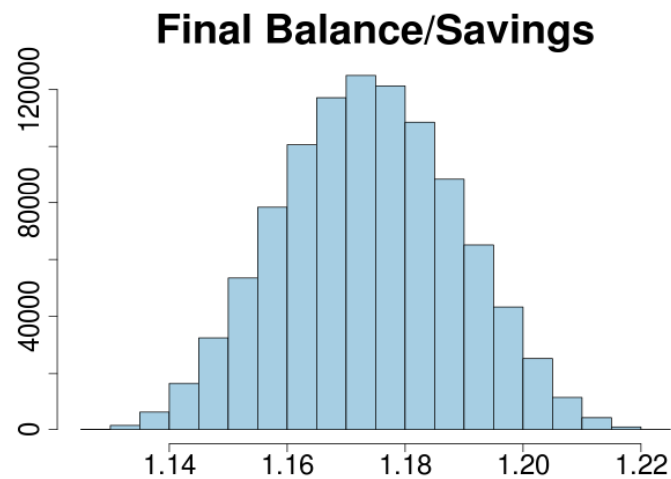
Model for Colombia: Results

14



Model for Colombia: Results

15

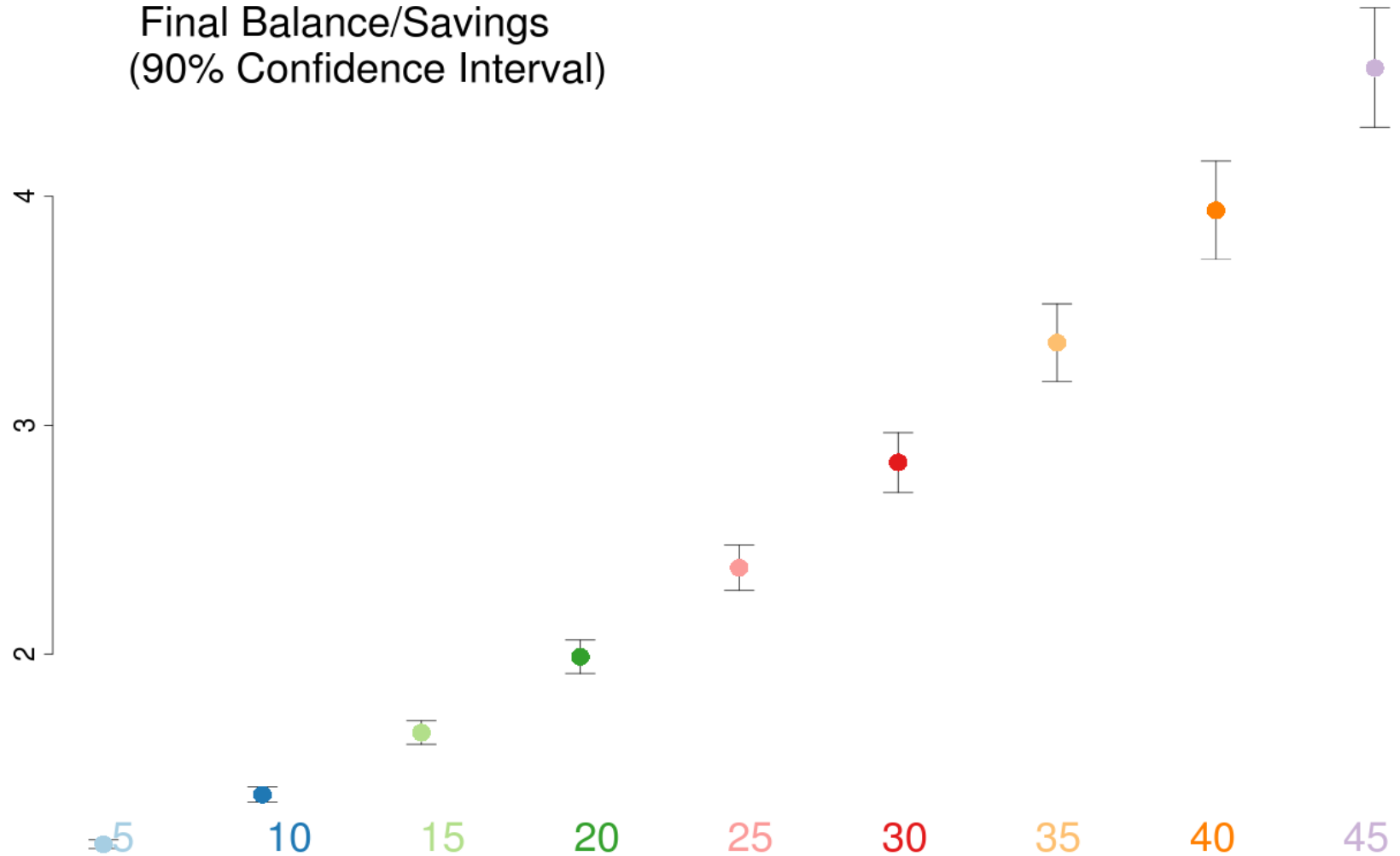


Normal
Results

Model for Colombia: Results

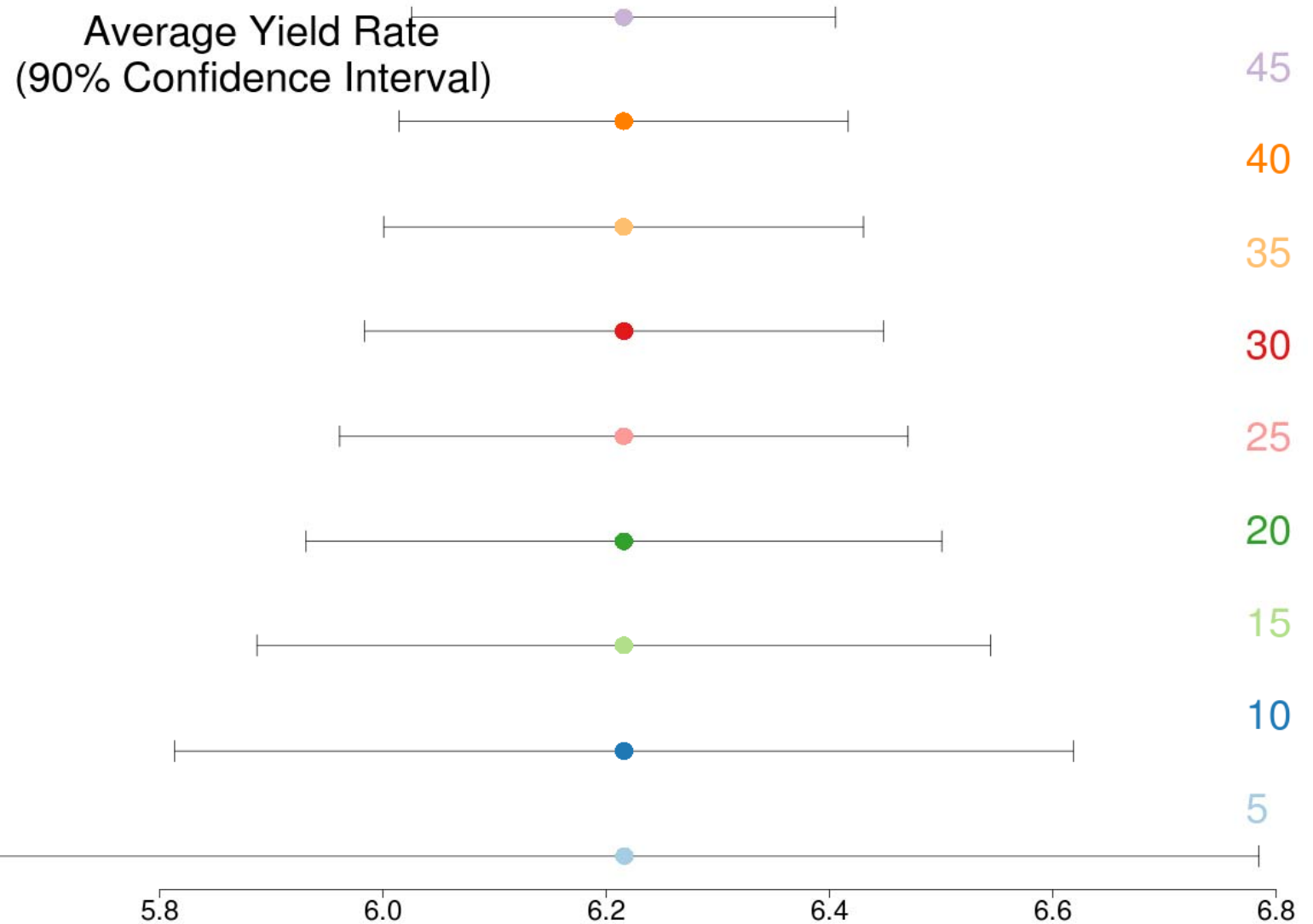
16

Final Balance/Savings
(90% Confidence Interval)



Model for Colombia: Results

17



Assumptions for México

18

Multifunds implemented in **1997**

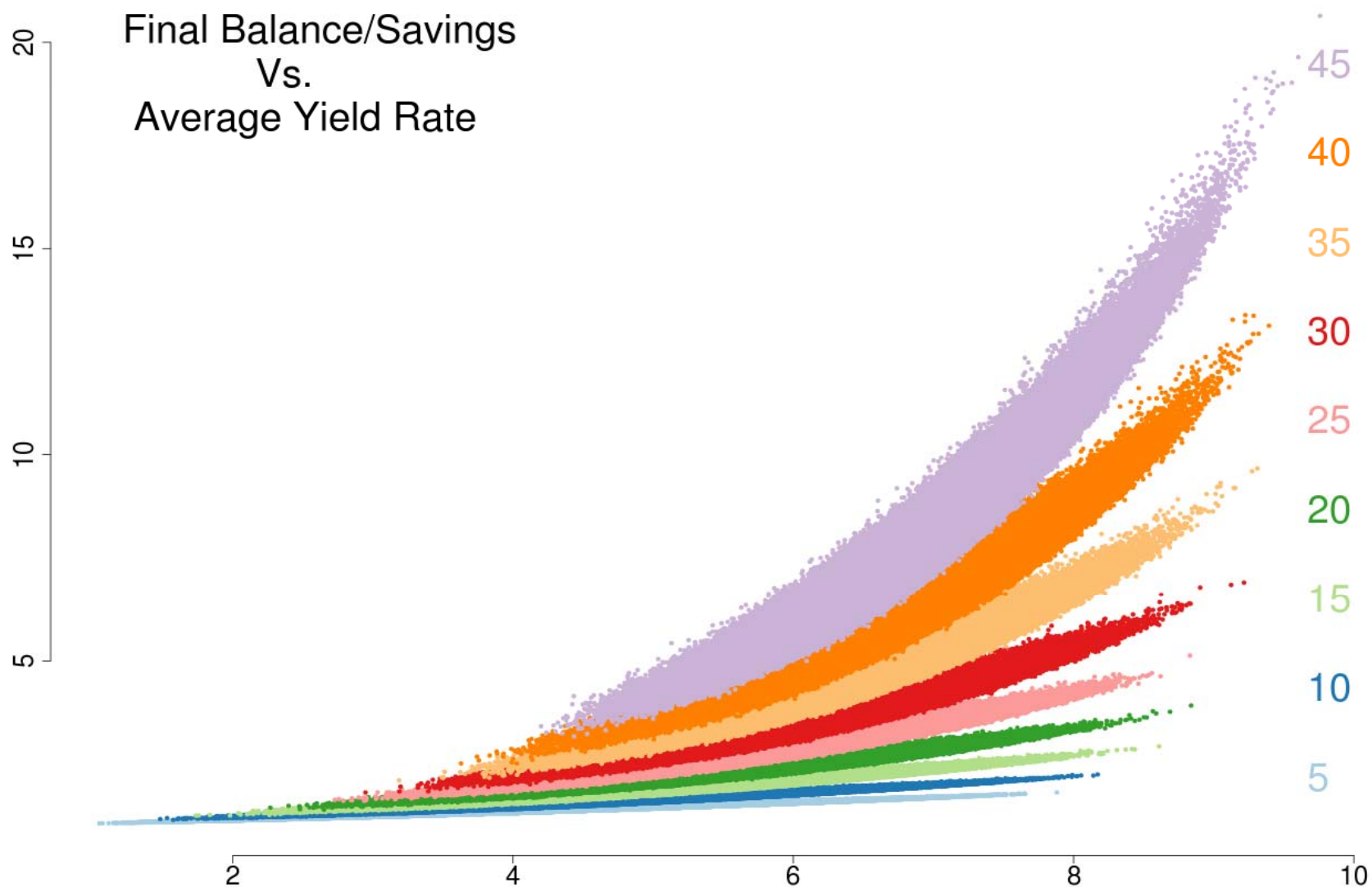
Publicly **mandated**, privately managed



Real Rate	8.89	8.03	6.87	5.84	4.40
Dev.	8.90	8.23	6.82	6.16	3.56

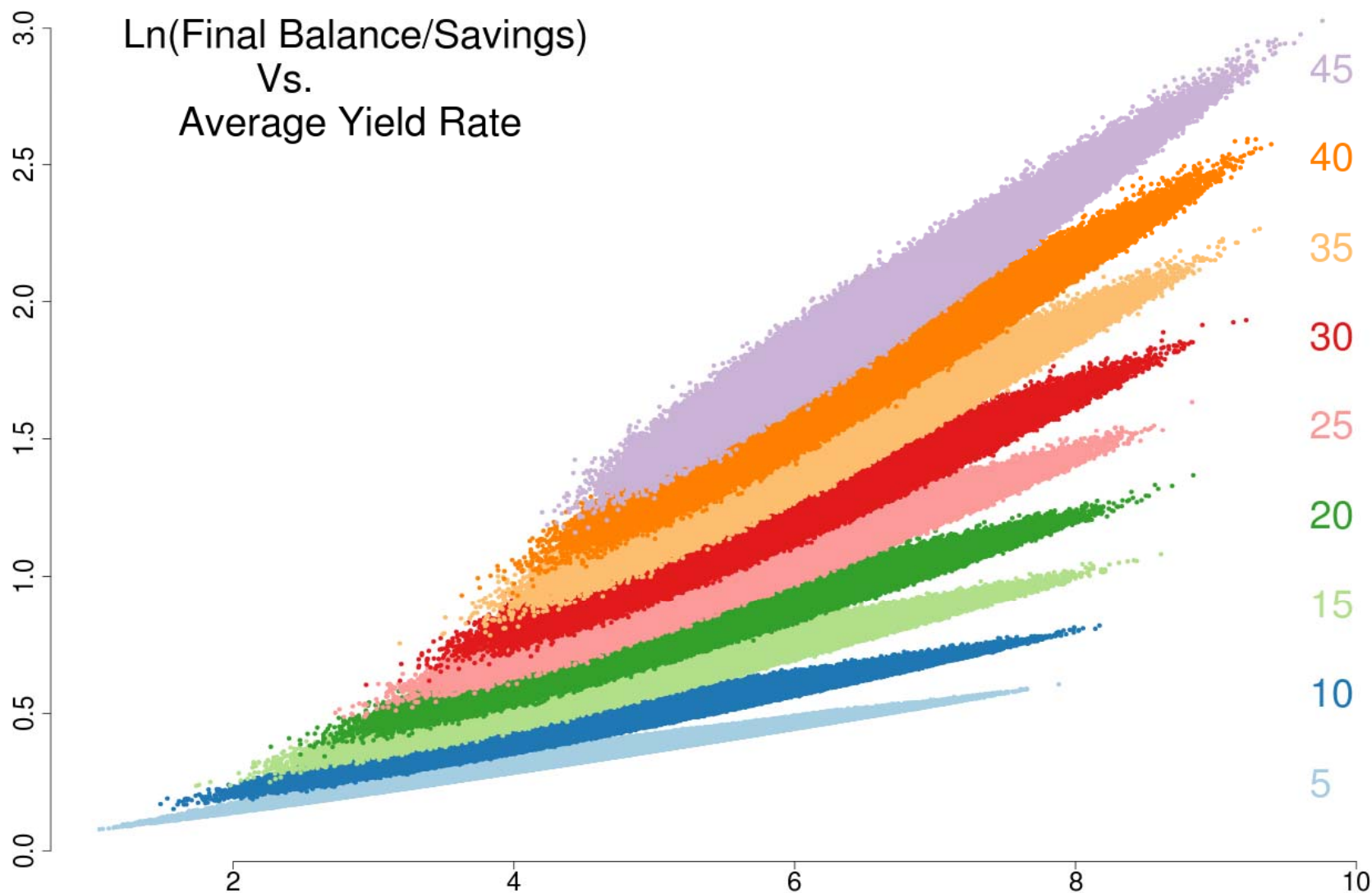
Model for México: Results

19



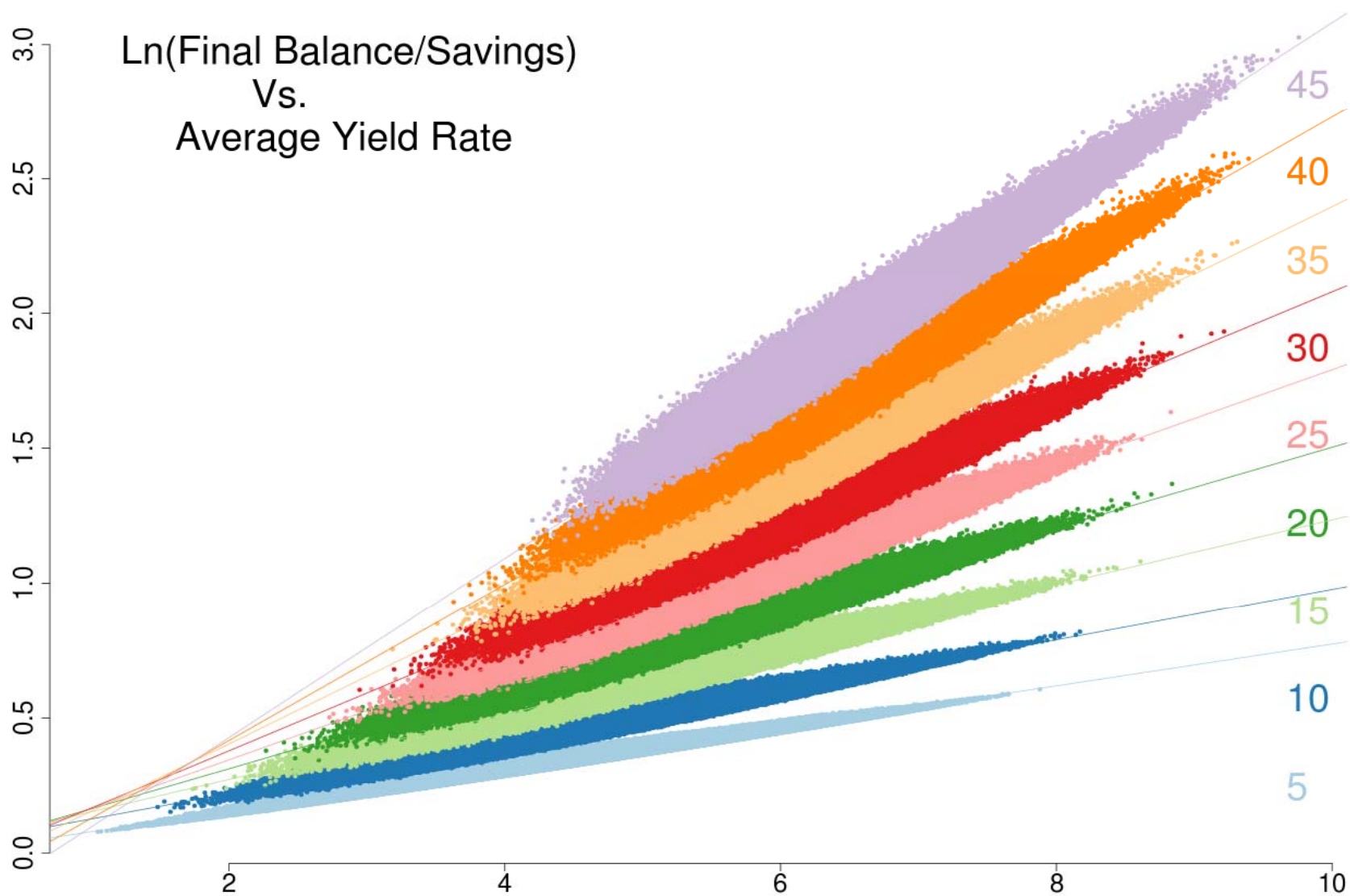
Model for México: Results

20



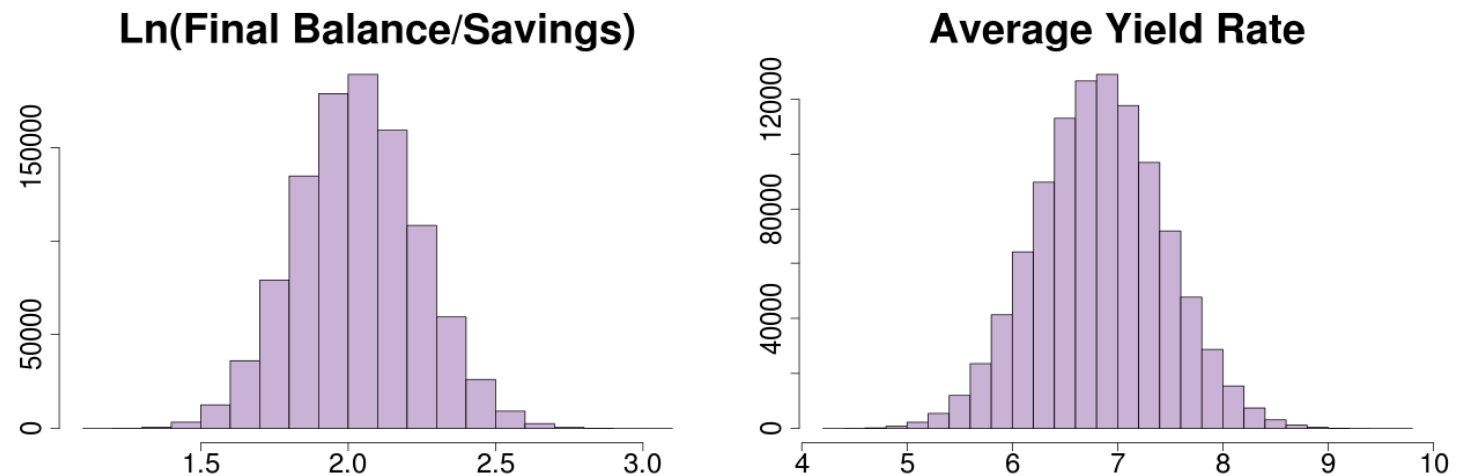
Model for México: Results

21



Model for México: Results

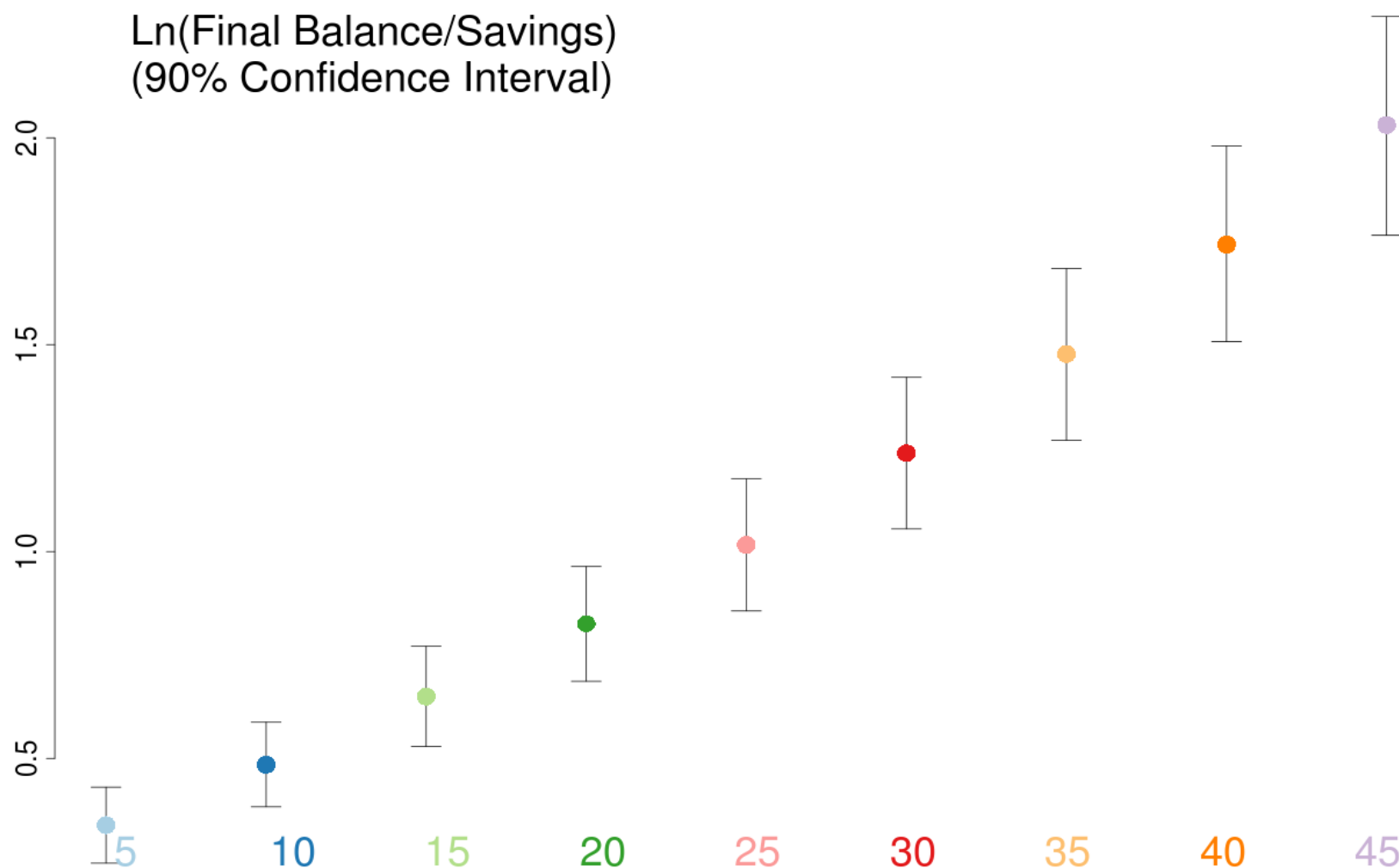
22



Normal Results for the
logarithm's (Ln) **Ratio**

Model for México: Results

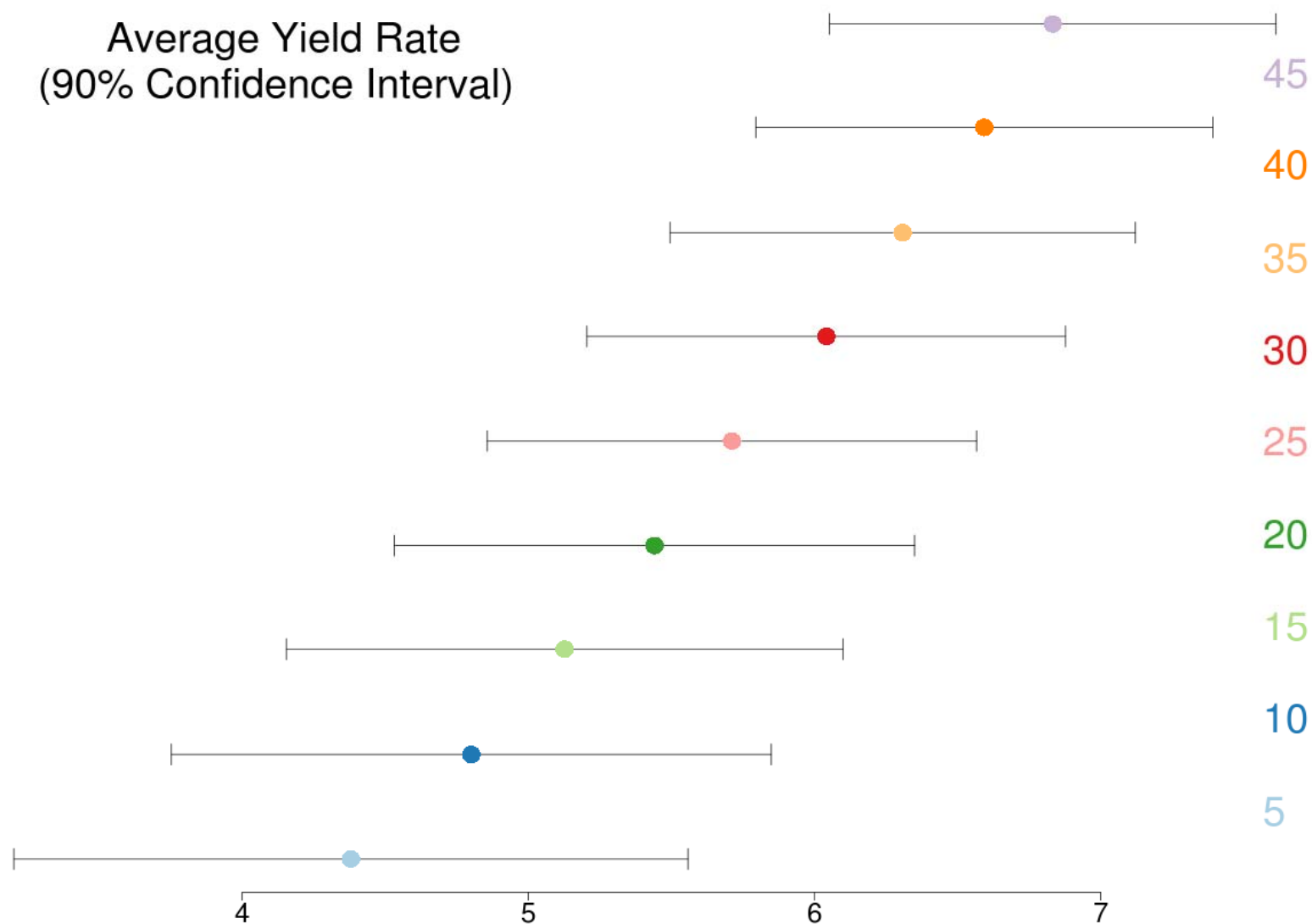
23



Model for México: Results

24

Average Yield Rate
(90% Confidence Interval)



Conclusions

25

Longer investment period favor the odds of a **greater balance**

Magnification effect: The slope of successive “*Bananas*” is greater for longer investment periods

The “*Banana*” model allows the **comparison** between DC systems

Conclusions

26

The “*Banana*” model depicts the **risk** in a DC system

The multifund scheme’s risk gives a **generous** reward: The magnification effect favors the affiliated in an **exponential** way





Este documento contiene metodologías, conocimientos técnicos, ideas, conceptos, técnicas, métodos de análisis, modelos, formatos, diseños, herramientas, material, y conceptos que son de propiedad de exclusiva de MERCER sin restricción alguna. Por lo tanto, el contenido de esta propuesta no podrá entregarse, compartirse, distribuirse con terceras personas, ni emplearse con fines distintos de los contemplados al momento que fueron proporcionados, sin que medie autorización previa escrita de Mercer.