Which Banana Piece Could be your Retirement Nest Egg?

Rodrigo Silva
General Framework

In a DC system, money is **financially** accrued and it is **actuarially** spent.

Affiliates are exposed to system **risk**.

It is necessary to **communicate** what does it means.
What is Risk?

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

www.thefreedictionary.com
What is Risk?
Plain Model: Assumptions

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

Final Balance/Savings Vs. Average Yield Rate
Plain Model: Results

Final Balance/Savings Vs. Average Yield Rate
Uniform distributed rates interest gives normal results
Plain Model: Results

Final Balance/Savings
(90% Confidence Interval)
Plain Model: Results

Average Yield Rate (90% Confidence Interval)
Plain Model: Conclusions

With the same average rate, different balances are obtained

The same balance can be obtained with different rates

Short tem processes are not rate sensitive

More saving future time means more centered processes
Assumptions for Colombia

Nominal rates obtained from historical rates for one of the AFPs

Real rate of 6.22% ± 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

Final Balance/Savings Vs. Average Yield Rate
Model for Colombia: Results

Final Balance/Savings Vs. Average Yield Rate
Model for Colombia: Results

Normal Results

Final Balance/Savings

Average Yield Rate
Model for Colombia: Results

Final Balance/Savings
(90% Confidence Interval)
Model for Colombia: Results

Average Yield Rate (90% Confidence Interval)
Assumptions for México

Multifunds implemented in **1997**

Publicly **mandated**, privately managed

<table>
<thead>
<tr>
<th>Real Rate</th>
<th>8.89</th>
<th>8.03</th>
<th>6.87</th>
<th>5.84</th>
<th>4.40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation</td>
<td>8.90</td>
<td>8.23</td>
<td>6.82</td>
<td>6.16</td>
<td>3.56</td>
</tr>
</tbody>
</table>
Model for México: Results

Final Balance/Savings
Vs.
Average Yield Rate
Model for México: Results

\[ \ln(\text{Final Balance/Savings}) \]

Vs.

Average Yield Rate

[Graph depicting a scatter plot with Ln(Final Balance/Savings) on the y-axis and Average Yield Rate on the x-axis.]
Model for México: Results

\[ \ln(\text{Final Balance/Savings}) \]

Vs.

Average Yield Rate
Model for México: Results

Normal Results for the logarithm’s (Ln) Ratio
Model for México: Results

\[ \ln(\text{Final Balance/Savings}) \]

(90% Confidence Interval)
Model for México: Results

Average Yield Rate
(90% Confidence Interval)
General Conclusions

Longer investment period favor the odds of a \textbf{greater balance}

\textbf{Magnification effect}: The slope of successive \textit{“Bananas”} is greater for longer investment periods

\textbf{Magnification effect}: The slope of successive \textit{“Bananas”} is greater for longer investment periods
General Conclusions

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.

Rodrigo Silva
r.silva55@egresados.uniandes.edu.co
Rodrigo Silva
r.silva55@egresados.uniandes.edu.co