



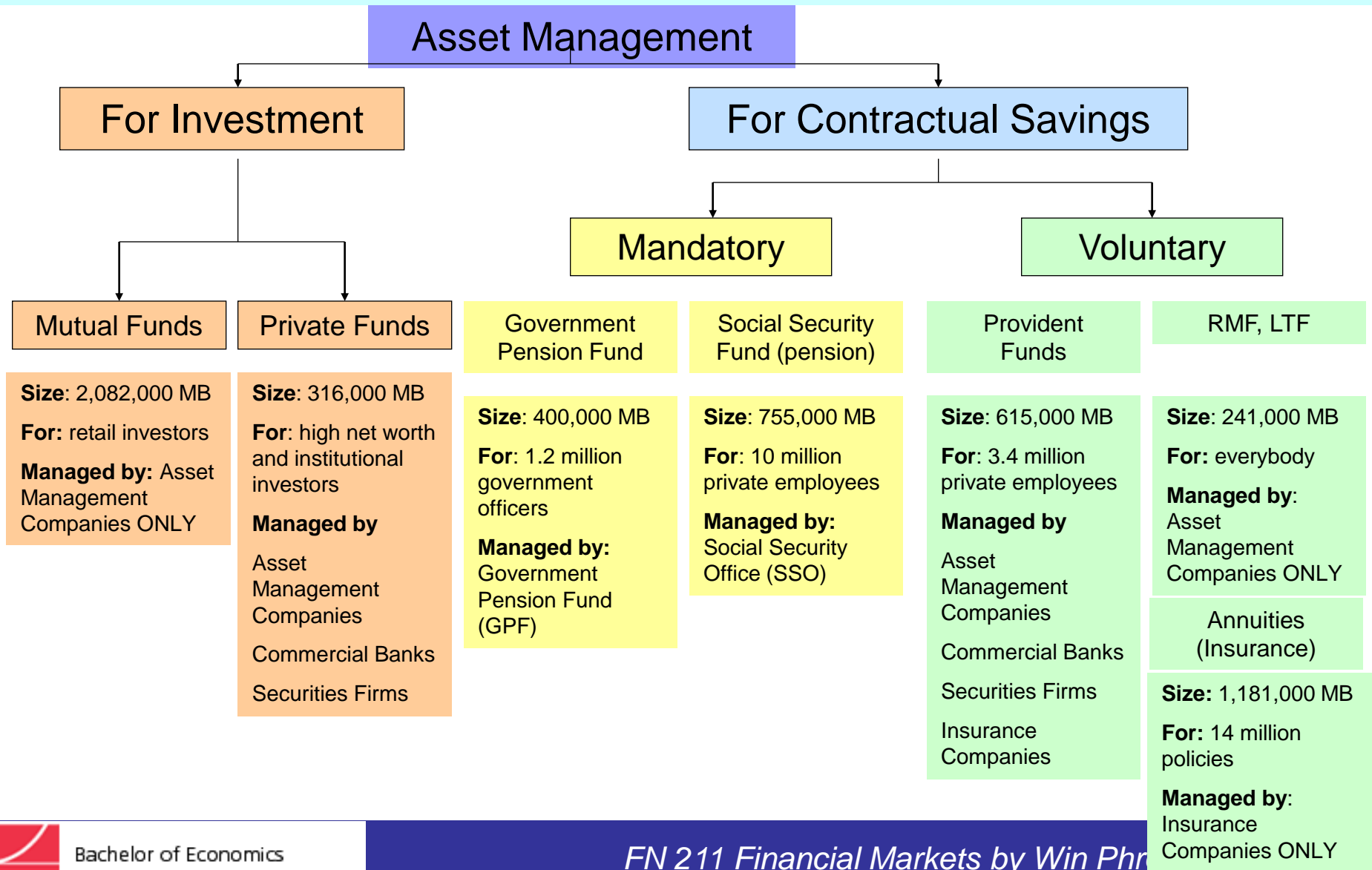
Bachelor of Economics
THAMMASAT UNIVERSITY

FN 211 Financial Markets

Class 8: Pension Funds

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The Asset Management Industry as of 31 Dec 2011



Pension Funds:

Introduction

Pension funds contain assets that are set aside to support a promise of retirement income. Generally, that promise is made by a private organization or a government. This organization is referred to as a **plan sponsor**.

There are two types of pension funds.

1. **A defined-contribution plan** specifies the sponsor's obligations in terms of contributions to the pension fund rather than the benefits to plan participants.
2. **A defined-benefit plan** is a plan that specifies the plan sponsor's obligations in terms of the benefit to plan participants.

Pension Funds:

Introduction

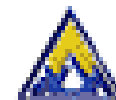
- For a defined-contribution plan, because the benefit is not promised, the participants bear the risk of poor investment results or the benefit is not enough to cover living expenses.

Example: **Government Pension Fund** (covers 1.2 million government officers)



- For a defined-benefit plan, because the sponsor has a financial obligation to pay specified future benefits, the sponsor bears a risk of not being able to make the promise.

Example: **Social Security Fund** (covers 10 million employees of private companies)



สำนักงานประกันสังคม
Social Security Office

Pension Funds: The Government Pension Fund

Government Pension Fund

Contributions: 3% from employer (the government) +
3% from employee

Pension Benefits: Lump sum equals to total
contributions plus investment income

Pension Funds:

The Government Pension Fund

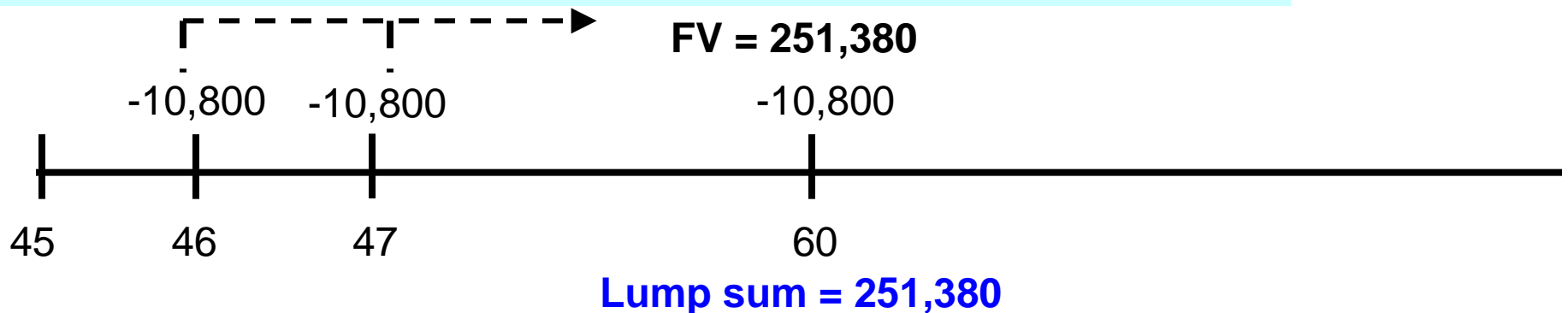
Mrs. Somsri, age 45, is a **government officer** and has just become a member of the GPF.

- She has monthly income of B15,000
- Her contribution = $3\% \times 15,000 = \text{B}450$ per month
- Employer Contribution = $3\% \times 15,000 = \text{B}450$ per month
- Total monthly contribution is then 900 Baht per month or 10,800 Baht per year.

When Mrs. Somsri **retires** at age 60

- Her retirement benefit is a lump sum equal to total contribution plus investment income earned during the contribution period.

Pension Funds: The Government Pension Fund



- Assuming annual investment return of 6% (annual compounding), her contribution of 10,800 per year for 15 years will grow to 251,380 Baht by the time she retires at age 60. (PV = 0, PMT = 10800, N = 15, I = 6, FV = 251,380)
- Her **lump sum pension** will then be **251,380 Baht**.
- As a plan participant, Mrs. Somsri bears the risk that
 - Investment return may be $< 6\%$ or...
 - this lump sum amount may not be enough to cover her living expenses for the rest of her life.

Pension Funds:

The Social Security Fund



Social Security Fund

Contributions: 3% from employer + 3% from employee

Pension Benefits:

- Contribute < 15 years
Lump sum equals to contributions plus investment income
- Contribute = 15 years
monthly pension equals to 20% of the average of the last 5 years of salary
- Contribute > 15 years
monthly pension equals to 20% of the average of the last 5 years of salary + bonus equals to 1.5% of the average of the last 5 years of salary for each additional year of contribution

Pension Funds:

The Social Security Fund



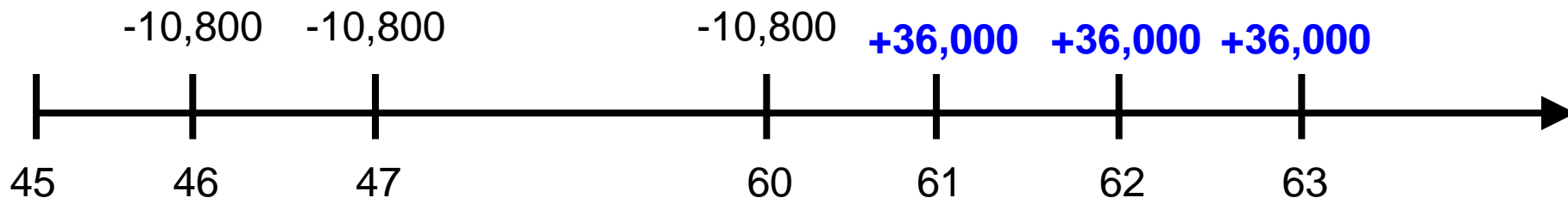
Mr. Somkid, age 45, is an **employee of a private company** and has just become a member of the SSF.

- He has monthly income of B15,000.
- His contribution = $3\% \times 15,000 = \text{B}450$ per month
- Employer Contribution = $3\% \times 15,000 = \text{B}450$ per month
- Total monthly contribution is then 900 Baht per month or 10,800 Baht per year.

When Mr. Somkid **retires** at age 60. (Note that he has contributed for 15 years)

- His retirement benefit = $20\% \times 15,000 = 3,000$ Baht per month or 36,000 Baht per year for the rest of his life.

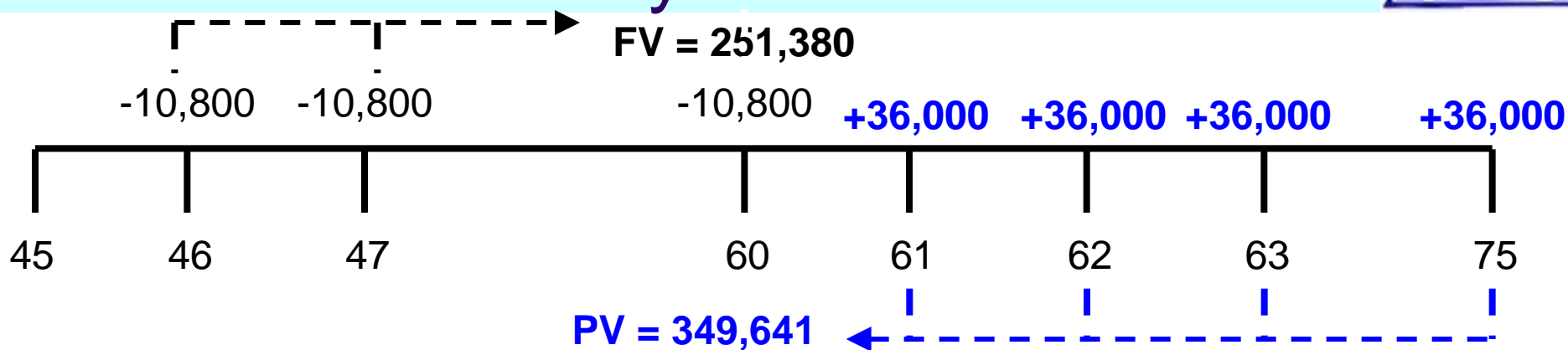
Pension Funds: The Social Security Fund



- Mr. Somkid has been contributing 900 Baht per month or 10,800 Baht per year for 15 years.
- He is entitled to **monthly pension** of 3,000 Baht per month or 36,000 Baht per year for the rest of his life.
- Although 3,000 Baht per month does not seem much, Mr. Somkid is **guaranteed** to receive this monthly pension benefit even if he lives long until the age of 80, 90 or 100+



Pension Funds: The Social Security Fund



- Assuming annual investment return of 6% (annual compounding), his contribution of 10,800 per year for 15 years will grow to 251,380 Baht by the time he retires at age 60. ($PV = 0$, $PMT = 10800$, $N = 15$, $I = 6$, $FV = 251,380$)
- Assuming Mr. Somkid passes away at age 75 and a discount rate of 6%, his **retirement benefits** of 36,000 Baht per year for 15 years have a PV of 349,641 Baht. ($FV = 0$, $PMT = 36000$, $N = 15$, $I = 6$, $PV = 349,641$)

Pension Funds: Summary



	GPF	SSF
Type	Defined Contribution	Defined Benefit
Contribution Rate	3% employee + 3% employer	3% employee + 3% employer
FV of Total Contribution	251,380	251,380
Benefit	Lump-sum at retirement = 251,380	Monthly pension until death = 3,000 (PV = 349,641 if live for 15 years)
Risk Taker	Participants (Mrs. Somsri)	Plan Sponsor (SSF)

Pension Funds:

The Social Security Fund



Additional Notes for the Social Security Fund

To qualify for monthly pension benefits, member must...

- Be at least 55 years old - - > Minimum Retirement Age
- Has contributed ≥ 15 years
- Has already retired from work

SSF was set up in 1999.

- Given that members must contribute ≥ 15 years to be qualified for pension, SSF will start to pay pension in 2014.
- Member who retires before 2014, and thus has contributed <15 years, will be entitled to lump sum pension.

Pension Funds:

The Social Security Fund



- Notice that, as a defined-benefit pension plan, SSF is required by law to provide pension benefit to Mr. Somkid, even though the **PV of benefits (349,641 Baht)** is greater than FV of contributions (251,380 Baht). - - > **Too generous**
- Assuming investment return of 6% and life expectancy of 75 for Thai male, SSF will always make a loss.
- As the plan sponsor, SSF bears the risk of not being able to provide enough pension benefits.

Pension Funds:

The Social Security Fund

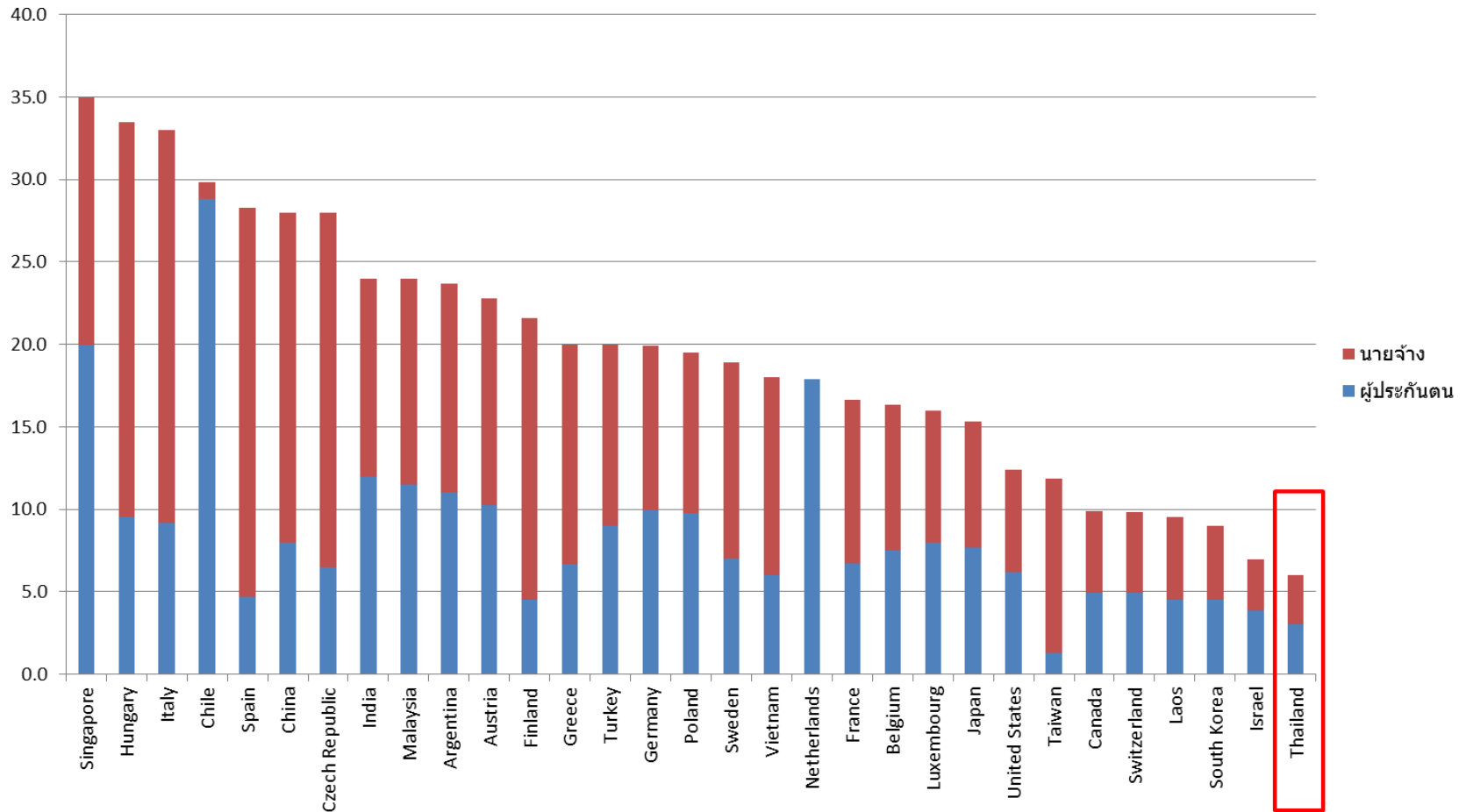


- Given that SSF will not pay pension benefits until 2014, at the moment there is more inflow (from contributions) than outflow (from paying benefits).
- In the future, SSF may face 2 potential problems:
 1. Structural changes - more elderly people
 2. The scheme may be too generous – in case of Mr. Somkid, PV of benefits (349,641 Baht) is greater than FV of contributions (251,380 Baht).
- Altogether, there will be a point where outflow is greater than inflow. It is projected that SSF will have a **shortfall** in 2044.

Pension Funds:

Contribution rates of selected countries

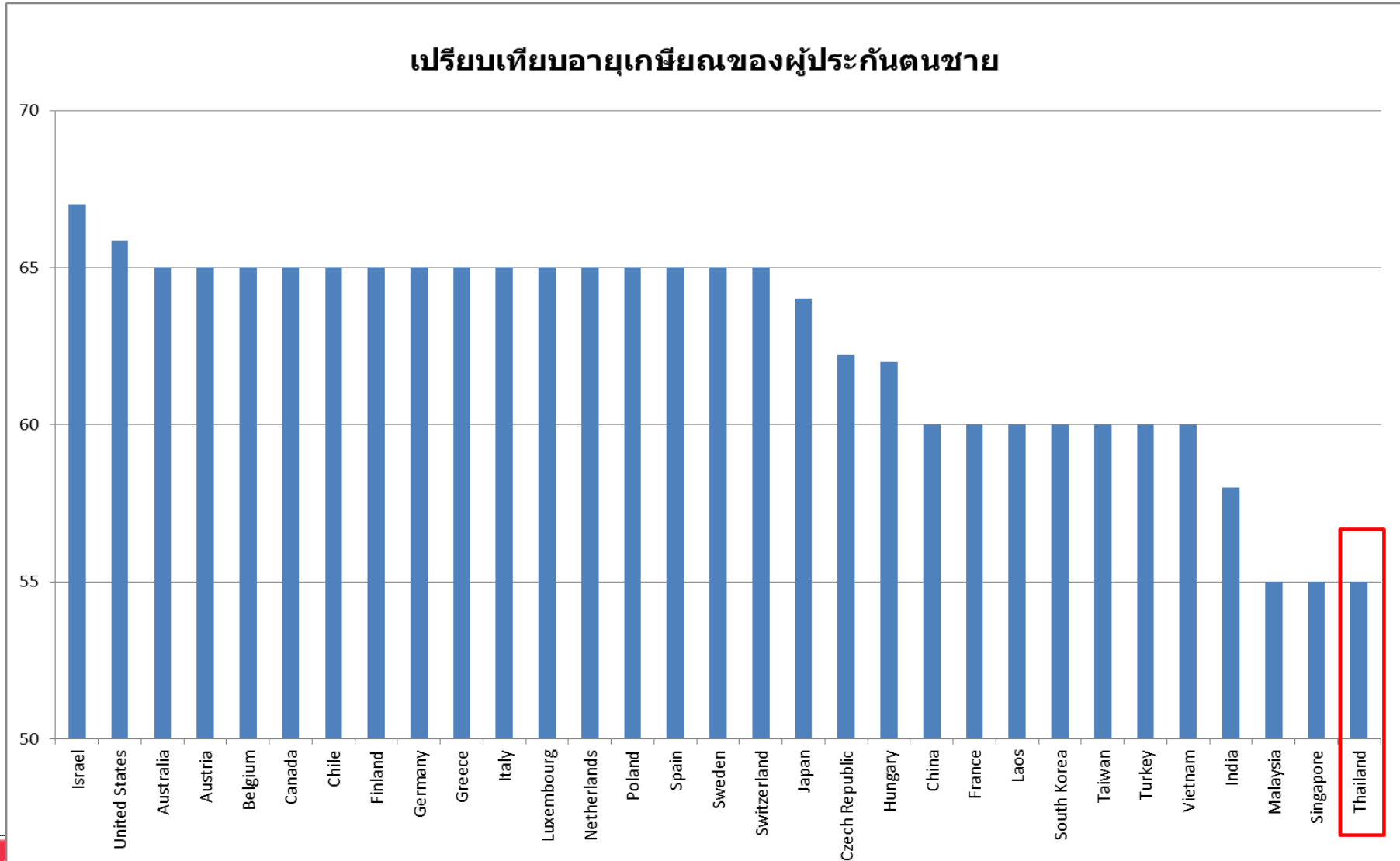
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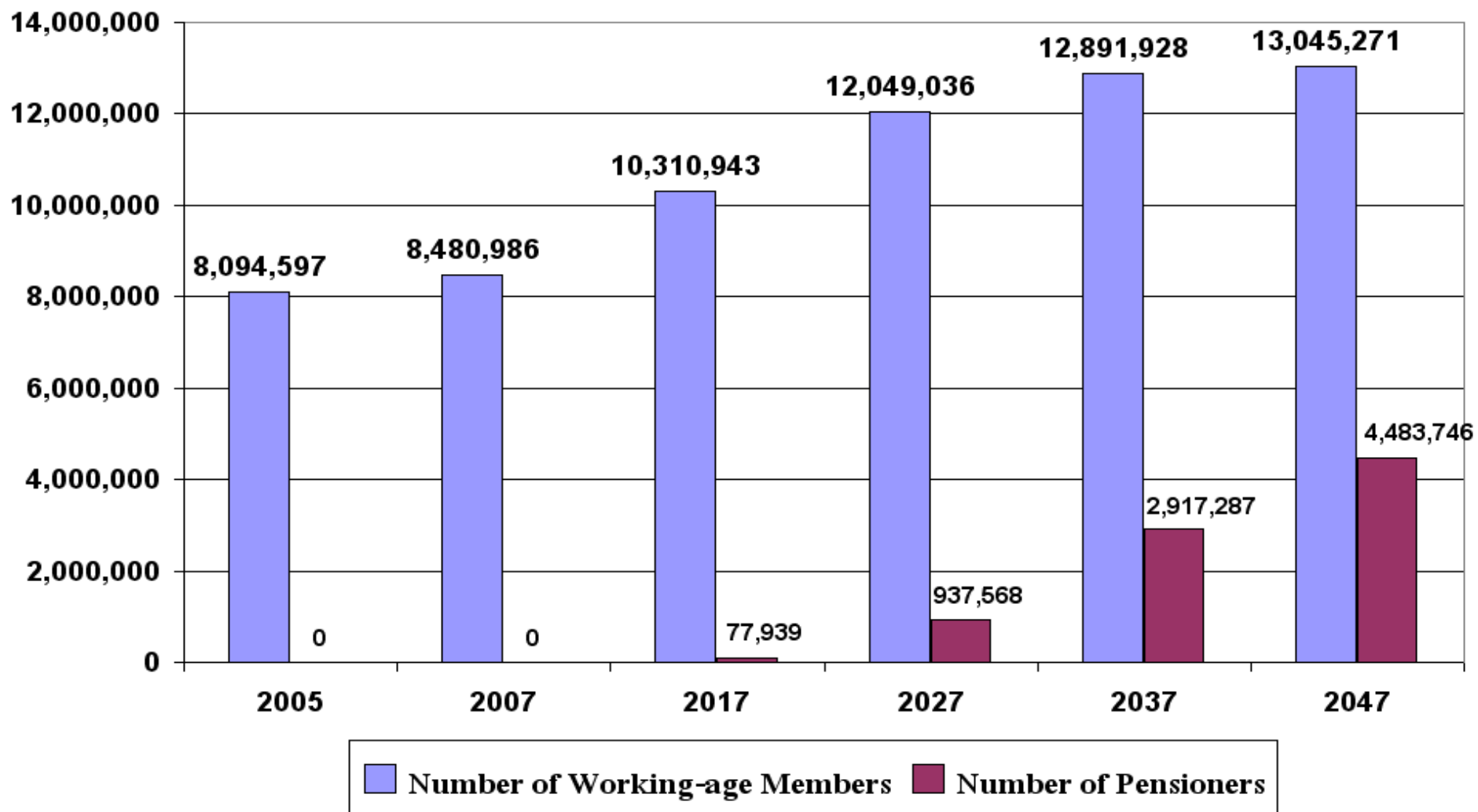
Pension Funds:

Retirement ages of selected countries

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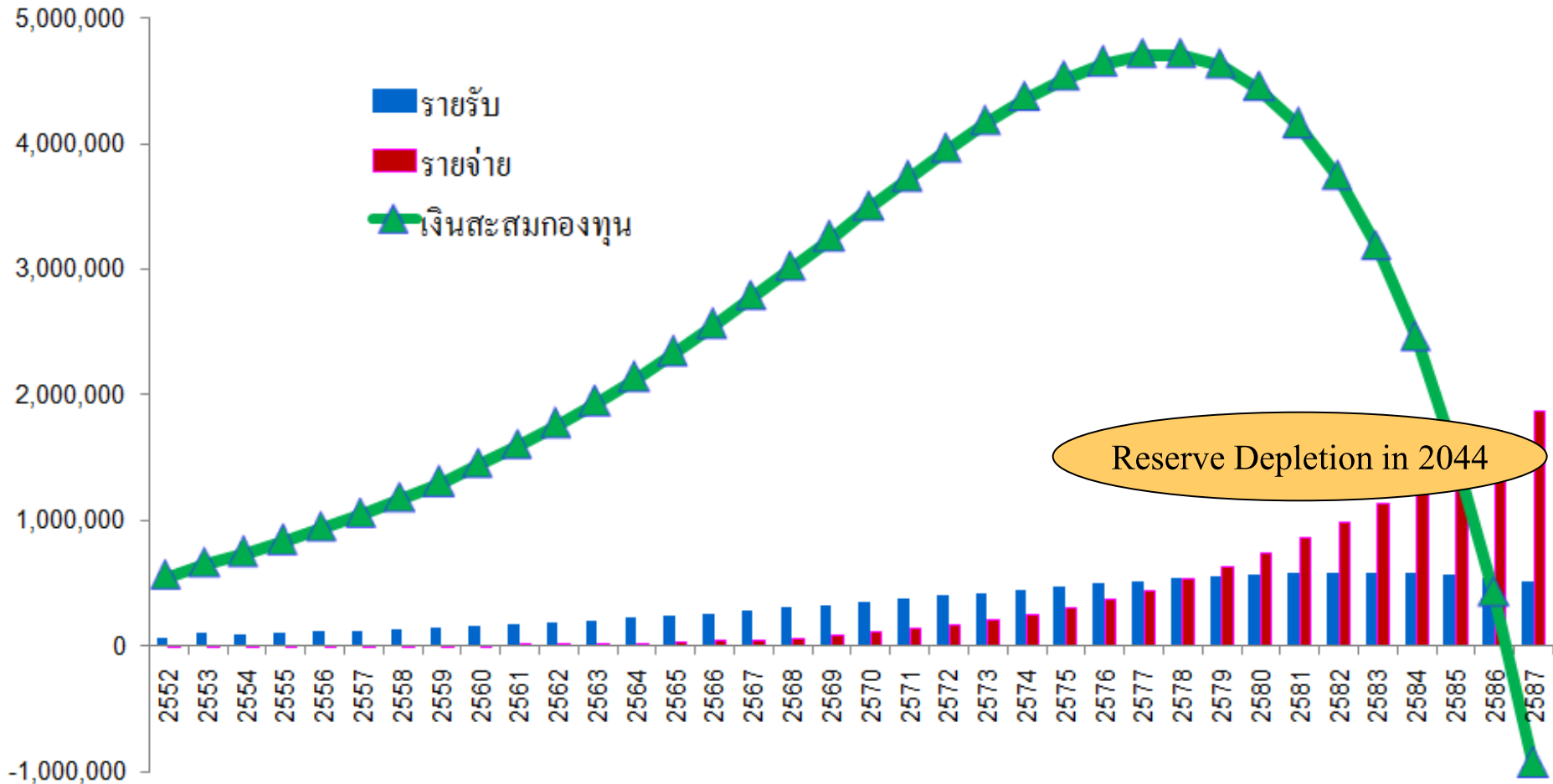


Pension Funds: The Social Security Fund





Pension Funds: Projection of the Social Security Fund



Pension Funds:

Asset Allocation of the Social Security Fund



Broad Asset Class	Sub-Asset Class	Current Asset Allocation	Strategic Asset Allocation
Equities	Thai Equities	9.5	8.0
	DM Equities		↑ 15.0
	EM Equities		
Fixed Income	Thai Fixed Income	88.0	↓ 51.0
	Global Sovereigns	2.0	↑ 16.0
	Global Corporates		
	EM Bonds		
Real Assets	Real Estate	0.5	↑ 10.0
	Infrastructure		
	Commodities		
Ratio of Low Risk: High Risk Assets		90:10	64:36
Expected Return		4.5%	5.5%
Chance of Fund Reserves depleted by 2060		57.7%	28.5%



Pension Funds:

Asset Allocation of the Social Security Fund

Broad Asset Class	Sub-Asset Class	Recommended Strategic Asset Allocation		Current Asset Allocation	
		Broad (%)	Sub (%)	Broad (%)	Sub (%)
Public Equities	Thai Equity	23	8	9.5	9.4
	Developed Market Equities		7		0.1
	Developed Small Cap Equities		2		-
	Defensive Equities		3		-
	Emerging Market Equities		3		-
Fixed Income	Thai Government Bonds	67	47	89.2	81.3
	Thai Non-Government Bonds		4		4.3
	Global Sovereigns		4		1.8
	Global Non-Sovereign Bonds		6		1.8
	Global Inflation-Linked		3		-
	Emerging Markets/Asia		3		-
Real Assets	Real Estate	10	3	0.8	0.8
	Infrastructure		2		-
	Commodities		2		-
	Gold		3		-
Cash	Cash	-	-	0.5	0.5
		100	100	100.0	100.0
Currency	THB		85		99.9
	Foreign Currencies		15 ⁵		0.1

Table 28: Recommended Strategic Asset Allocation

Pension Funds:

Asset allocations of selected funds



สำนักงานประกันสังคม
Social Security Office

	CalPERS	Yale Uni. Endowment	MetLife	SSF
Fixed Income	21.9%	4.4%	86.4%	90.0%
Public Equities	53.4%	16.9%	1.0%	9.5%
Private Equities	13.8%	30.3%	1.9%	-
Real Estate	7.4%	27.5%	2.4%	0.5%
Hedge Funds	-	21.0%	-	-
Others	3.4%		8.3%	-