

The Effect on Reducing Insolvency by Asset Mix of Life Insurance Company

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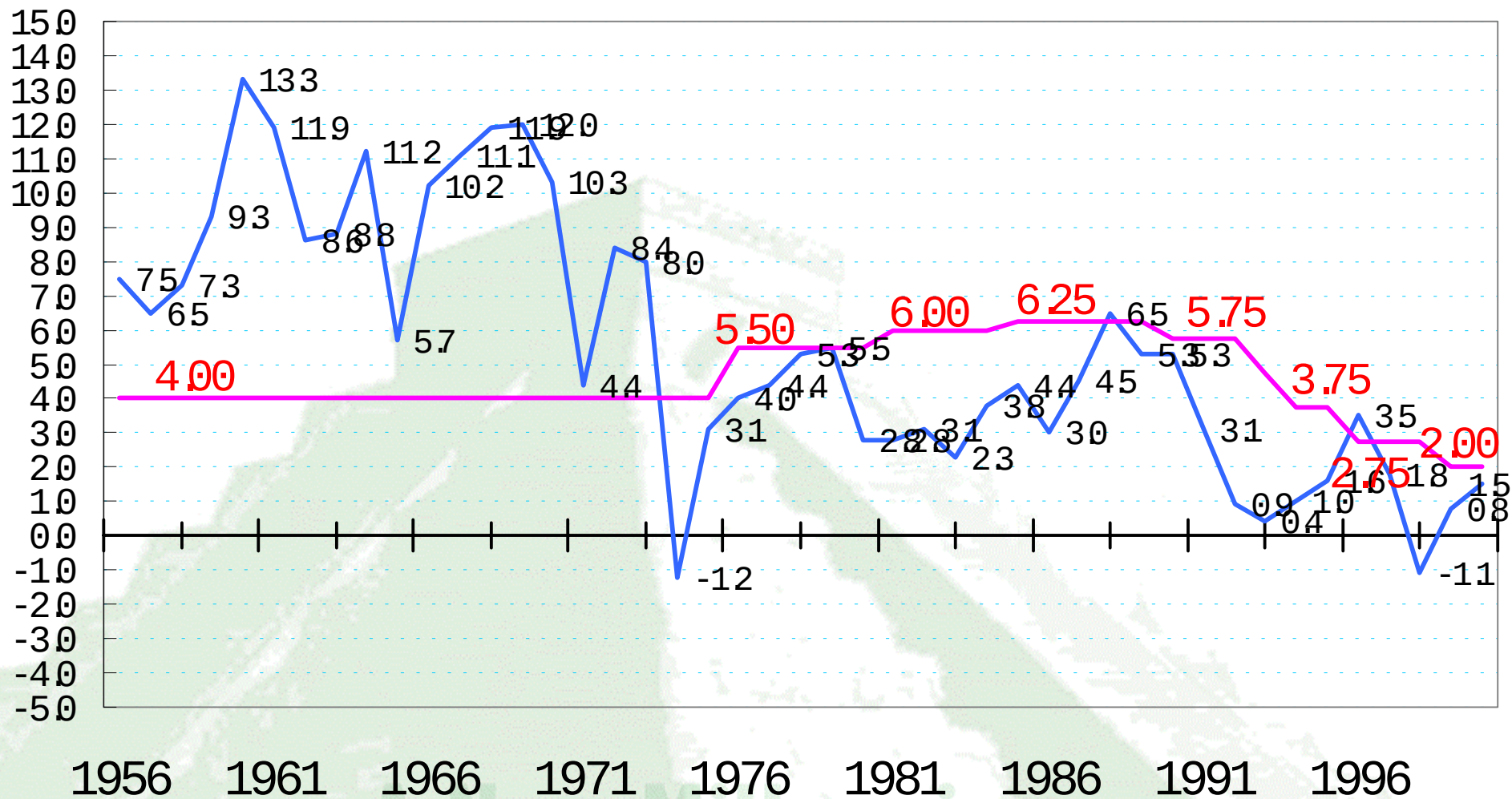
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1. Preface

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1.1 Shift of GDP & Interest



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1.2 Shift of Total Assets of Insolvent Life Insurance Companies

No	Life Ins. Company	Time of Insolvency	Total Assets (Unit:billion yen)					
			1995	1996	1997	1998	1999	2000
1	Nissan	Apr.1997	2,499	2,060	-	-	-	-
2	Toho	Jun.1999	4,167	4,509	3,001	-	-	-
3	Daihyaku	May 2000	3,527	3,318	2,762	2,467	-	1,193
4	Taisho	Aug.2000	238	233	228	231	204	104
5	Chiyoda	Oct.2000	6,442	5,816	5,028	4,359	3,501	-
6	Kyoei	Oct.2000	5,763	5,725	5,245	5,080	4,609	4,099
7	Tokyo	Mar.2001	1,556	1,468	1,328	1,239	1,095	-
Total of Insolvent Life Ins.			24,689	23,132	17,595	13,379	9,411	5,397
Total of traditional Life Ins.(except Insolvent 7 _{Com})			184,976	160,464 (12.6%)	165,219	167,325	166,955	166,316

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1.3 Shift of Total Assets of Merger Life Insurance companies

No	Life Ins. Company	Time of Merger	Total Assets (Unit: billion yen)					
			1995	1996	1997	1998	1999	2000
1	Meiji	Apr.2004	16,629	16,709	17,045	17,281	16,846	17,469
2	Yasuda		9,200	9,233	9,474	9,745	10,080	10,256
3	Daido	Apr.2004	5,011	5,059	5,346	5,482	5,733	5,900
4	Taiyo		6,445	6,703	6,825	6,969	7,081	7,266

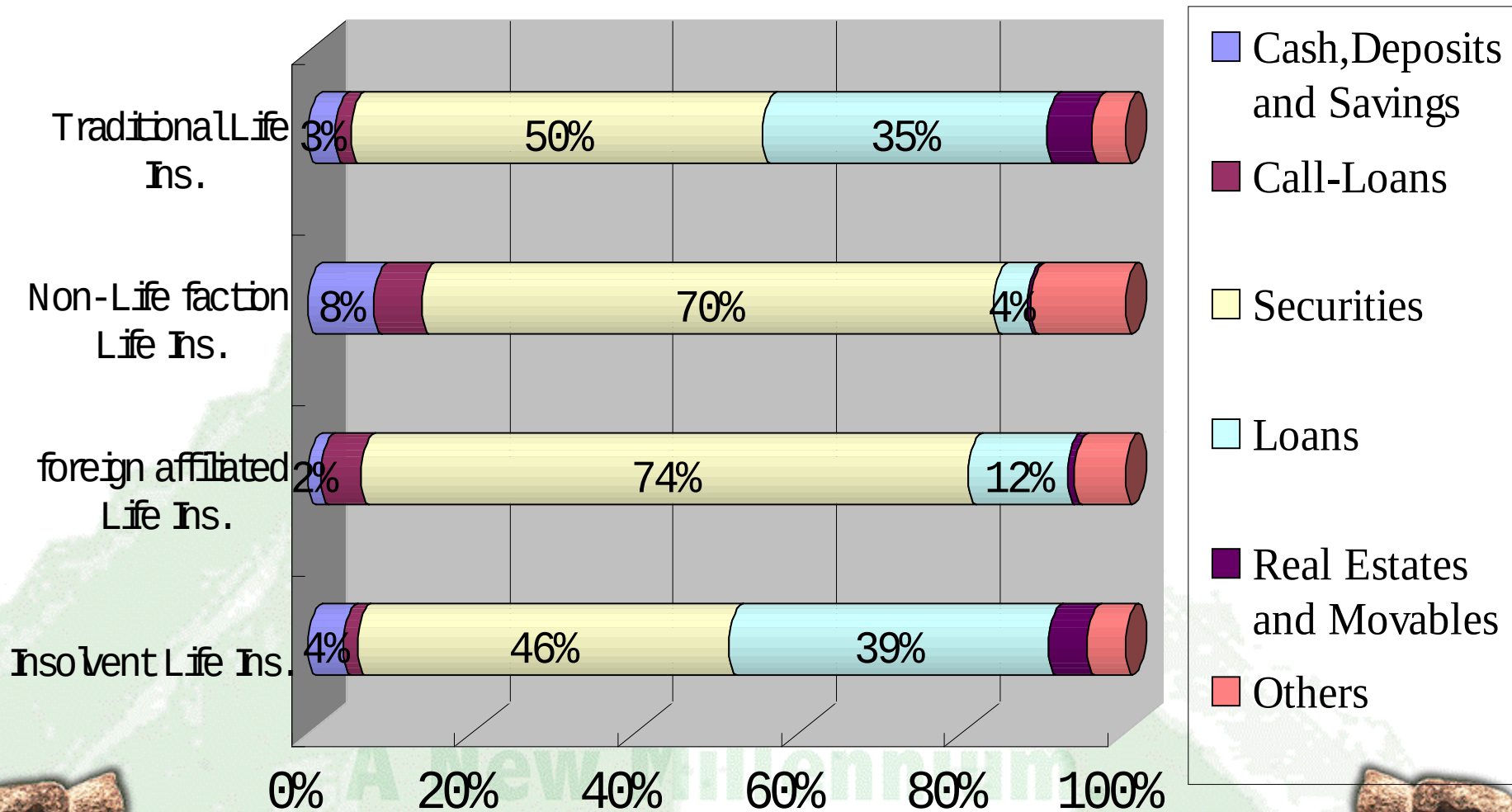
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1.4 Shift of Total Assets of Insolvent Life Insurance Companies

No	Life Ins. Company	Time of Insolvency	Total Assets (Unit:billion yen)					
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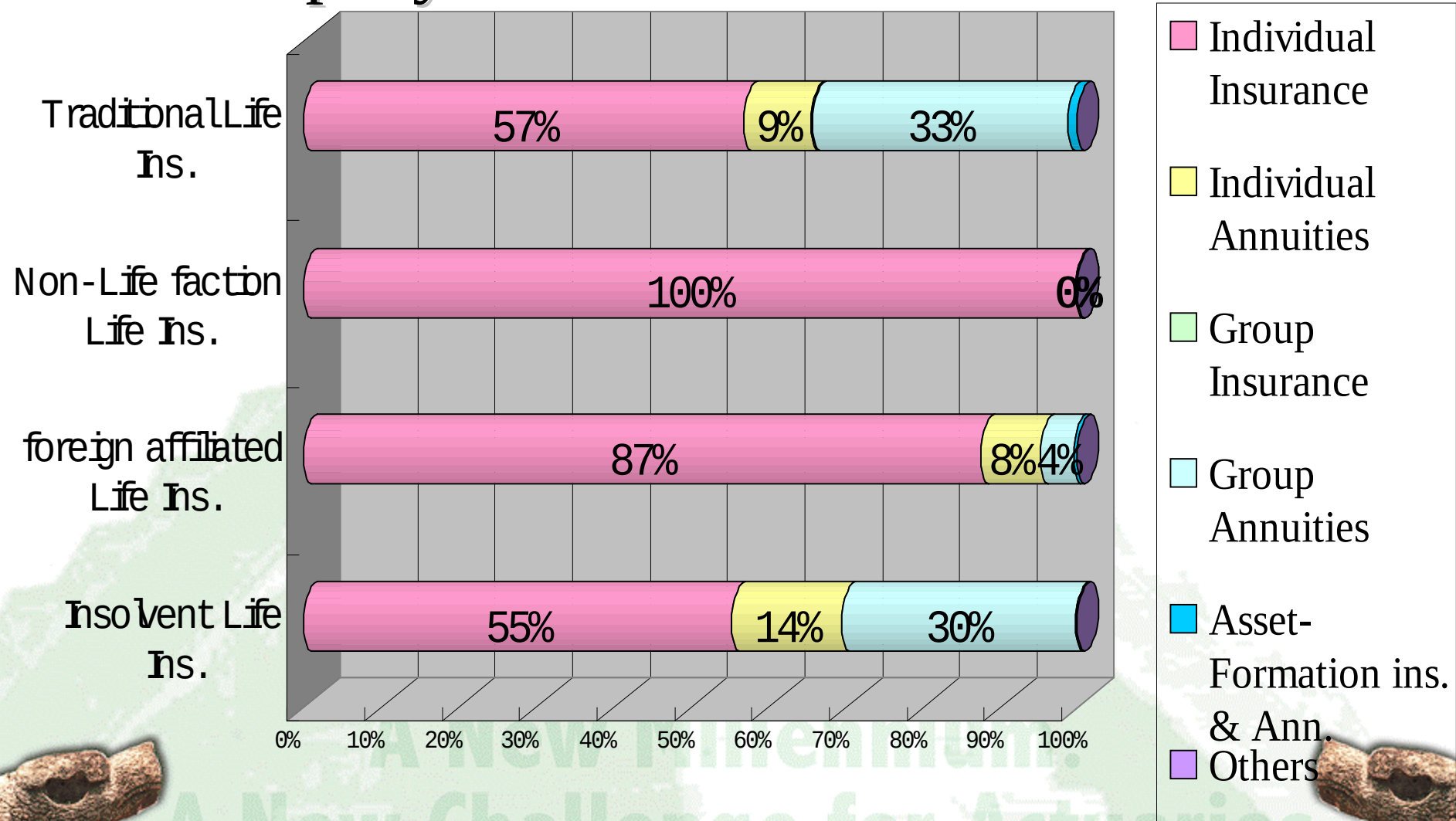
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1.5 Share of Assets in Life Insurance Company



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1.6 Share of Liabilities in Life Insurance Company



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2. Effect of Assets Mix & Product Mix on Reducing Risk



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2.1 Risk-Return plane & Insolvency-Return plane

Fig1.2

Risk-Return Plane

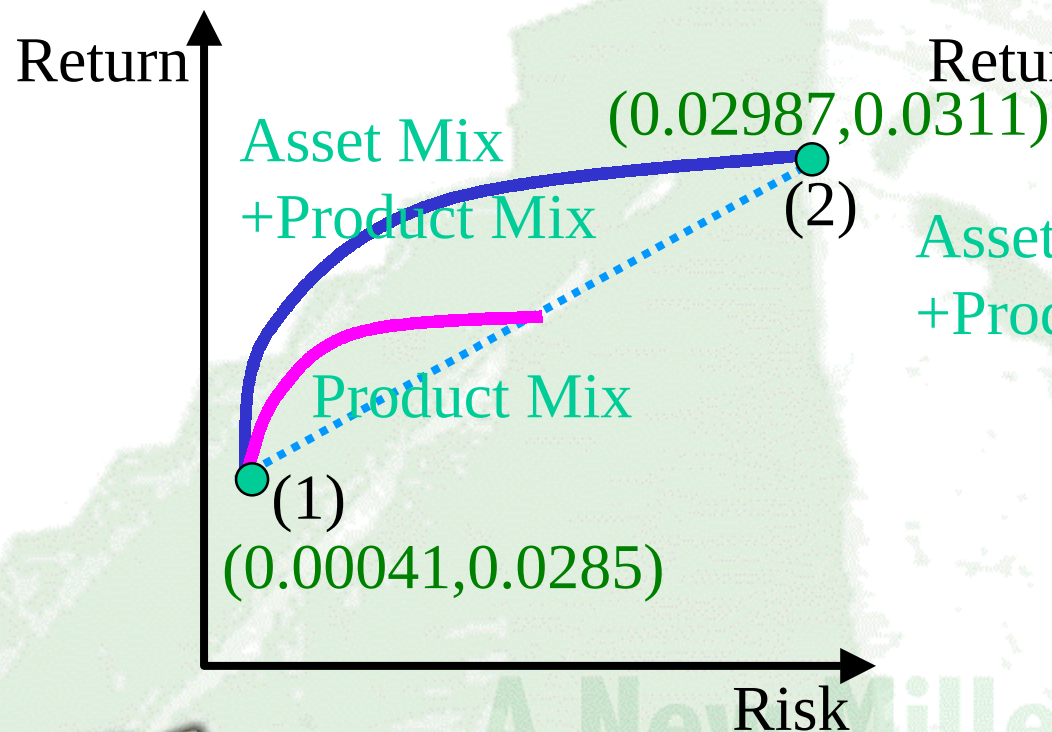
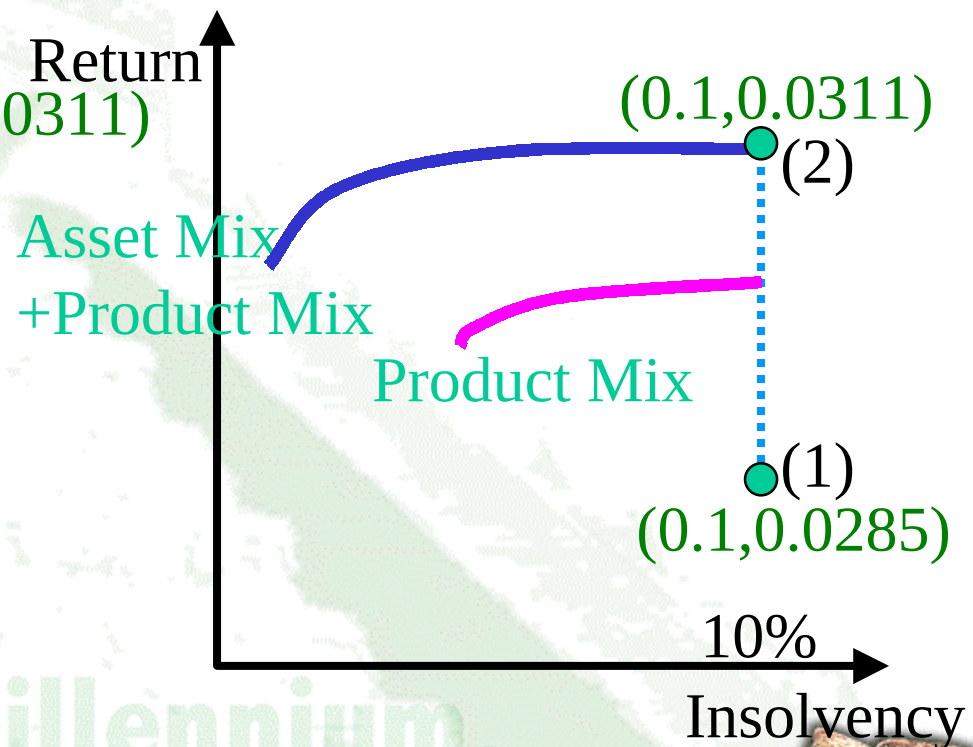
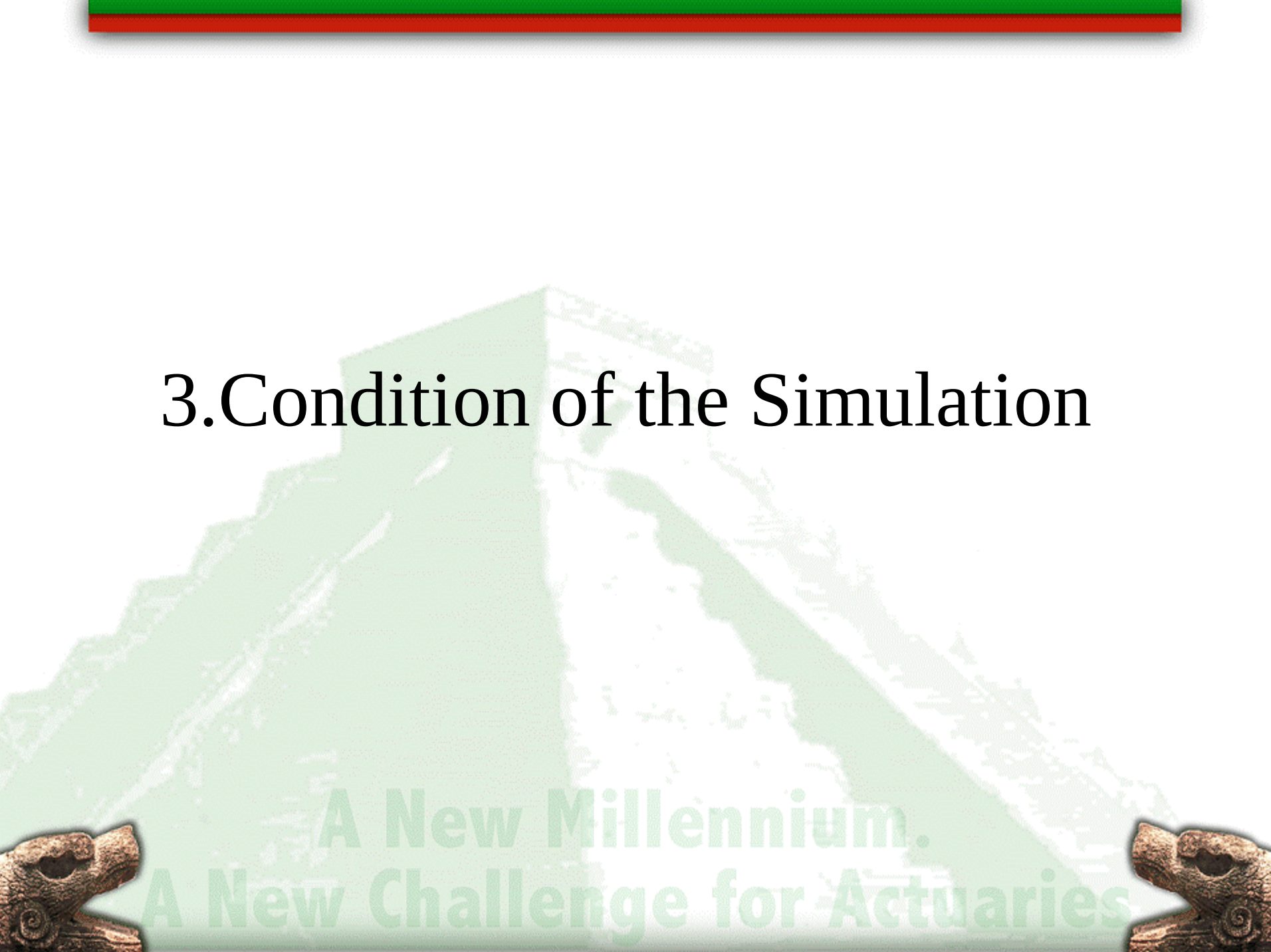


Fig1.3

Insolvency-Return Plane



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3. Condition of the Simulation

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3.1 Base Rate of Calculating

(Policy Term. 15 years, from Age 30)

	Expected Rate	Actual Rate
Interest rate	2.7% (=3% (r_0) $\times$ 0.9)	interest rate based on general probability model
Mortality	1996 life table	the process of mortality based on binomial distribution
Operating expense rate	$P \times e$ (10% probability of Insolvency)	the process of operating expense rate based on inflation rate

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3.2 Amounts of scheduled payment at maturity and at death

(gross premium = 1)

	expected operating expense rate	Sums payable at maturity	Sums payable at death
Endowment	12.24 %	$S' = 16.232$	$S = 16.232$
Special Endowment	11.67 %	$S' = 13.508$	$S = 135.08$
Term	12.20 %	$S' = 0$	$S = 697.90$

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3.3 General Probability Model

general form • $dr = a(b\alpha - r)dt + r^\gamma \sigma \beta dZ$

	a	b	α	σ	β	γ
Invest 1	0.5	3.0	1.0	1.0	1.0	0.5
Invest 2	0.5	3.0	1.1	1.0	1.367	0.5
Invest 3	0.5	3.0	1.2	1.0	1.6545	0.5
Inflation rate	0.5	1.0	1.0	1.0	1.0	1.0

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3.4 Correlation Coefficient (ρ)

Assume the correlation coefficient (ρ) between investment models and inflation rate as base rate 0.5.

	Invest 1	Invest 2	Invest 3	Inflation rate
Invest 1	1.0			
Invest 2	ρ	1.0		
Invest 3	ρ	1.0	1.0	
Inflation rate	1.0	ρ	ρ	1.0

3.5 Asset Share Simulation

$$AS(t+1) = \{ (P - E(t) + AS(t)) (1+r(t)) - S(t+1)q(x+t) \} / (1-q(x+t))$$

. 1. Risk / Return

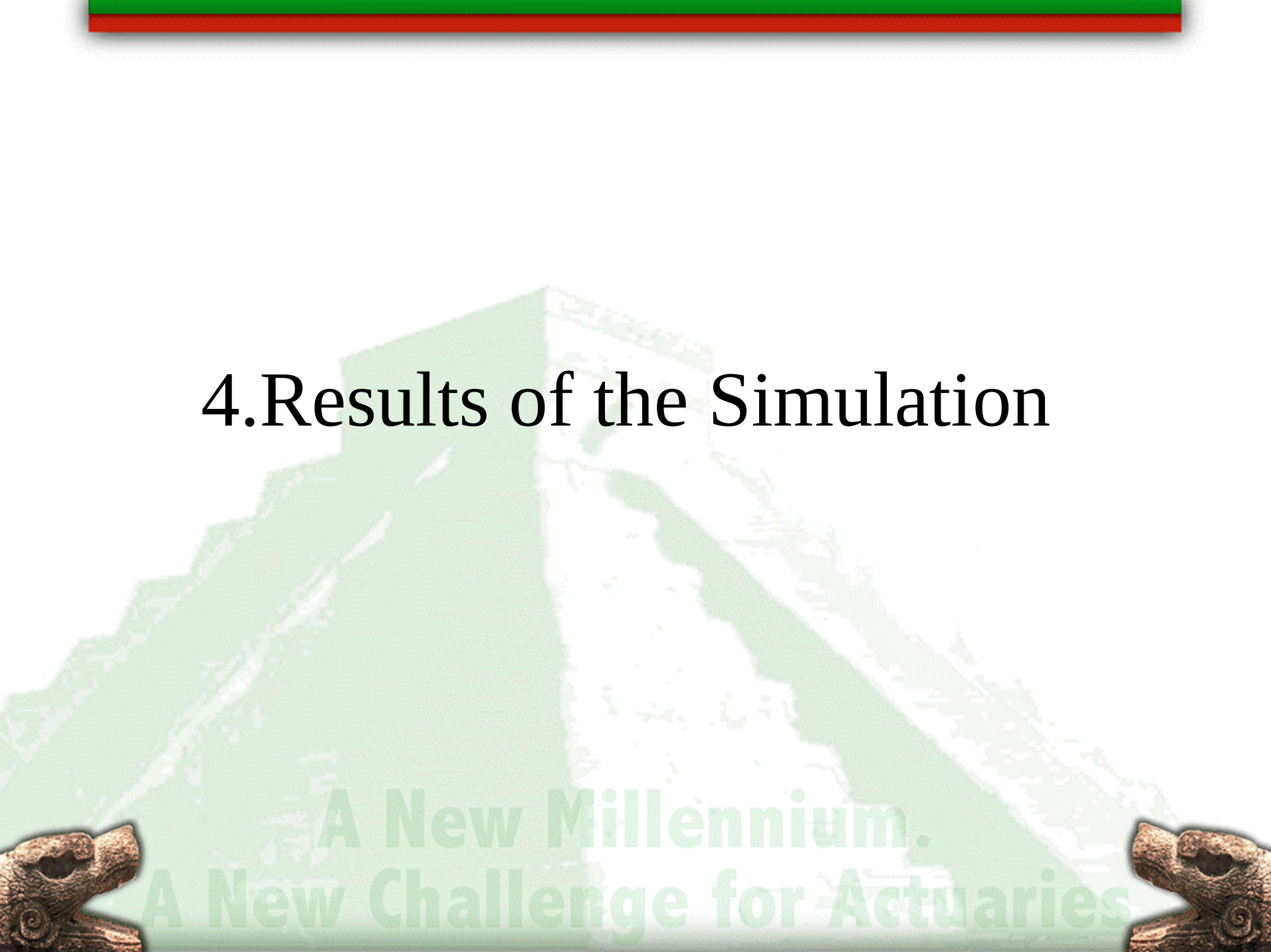
* Return is defined as the average of return rate.

* Risk is defined as standard deviation of return rate.

. 2. Probability of insolvency

Probability of insolvency is defined as the probability that the asset share (at maturity) is below the liability reserve.

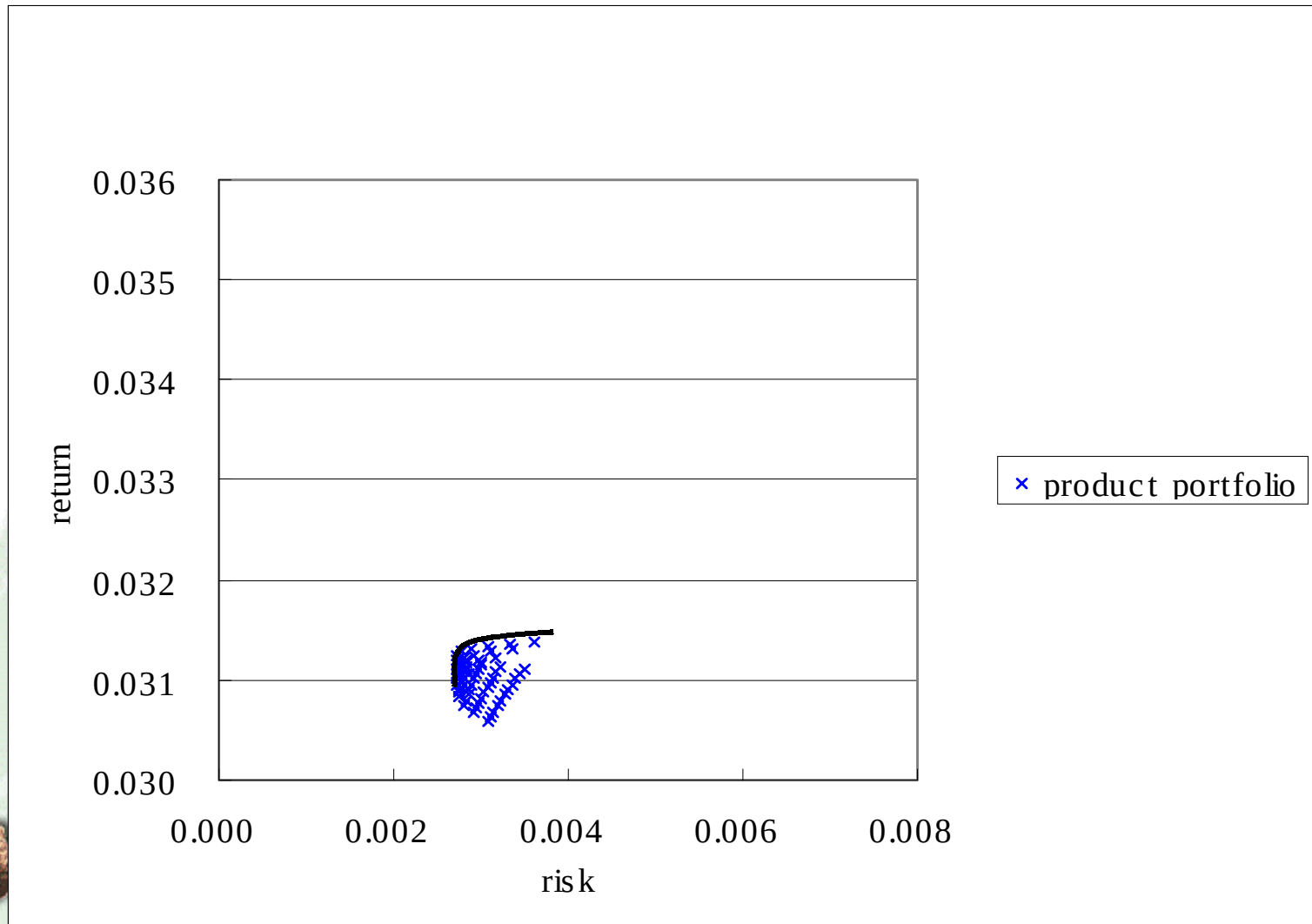
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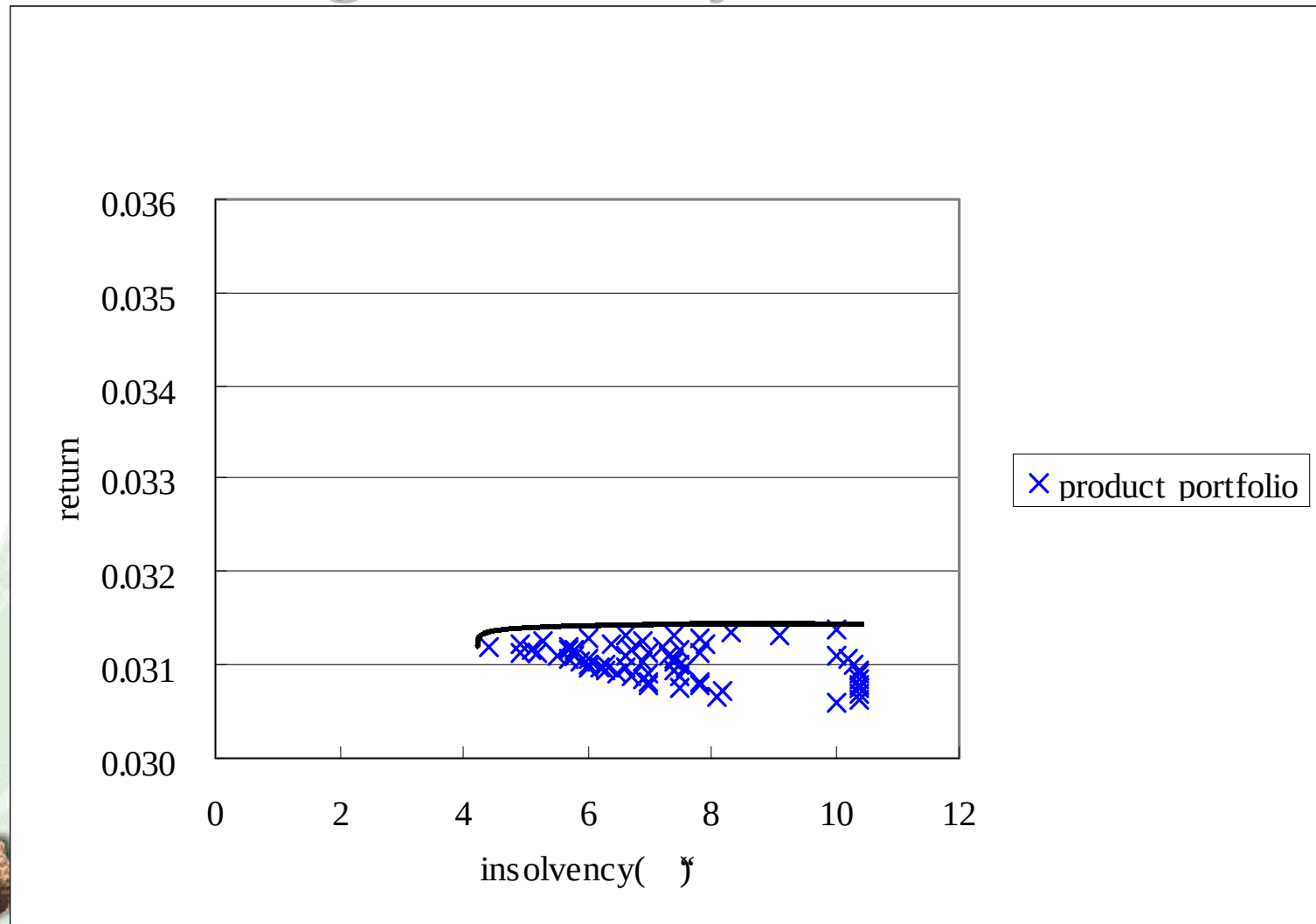
4.Results of the Simulation

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4.1 Effect of Product Portfolio on Reducing Risk



4.2 Effect of Product Portfolio on Reducing insolvency



4.3 Probability of Insolvency by source of profit for Product Portfolio

	Single Product			Product Portfolio (E:T=7:3)
	Endowment	Special Endowment	Term	
Profit from all source	10.0 %	10.0 %	10.0 %	4.4 %
Investment Profit	35.5 %	35.1 %	32.0 %	34.2 %
Mortality Profit	35.7 %	36.1 %	36.2 %	36.3 %
Expense Profit	0.0 %	0.0 %	0.0 %	0.0 %



5. Structure Analysis of the Reducing Risk by Product Mix

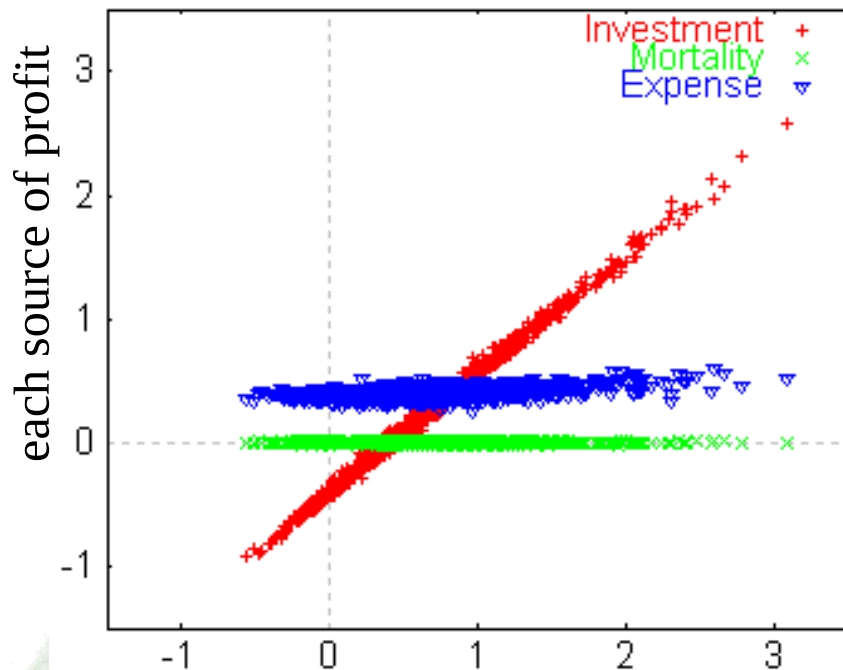
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5.1 Correlation Coefficient by Source of Profit

Correlation Coefficient		Endowment			Term		
		Invest	Mortality	Expense	Invest	Mortality	Expense
Endowment	Invest	1.000					
	Mortality	-0.008	1.000				
	Expense	0.476	-0.006	1.000			
Term	Invest	0.665	-0.011	-0.268	1.000		
	Mortality	-0.029	0.856	-0.034	-0.019	1.000	
	Expense	0.475	-0.005	1.000	-0.027	-0.034	1.000

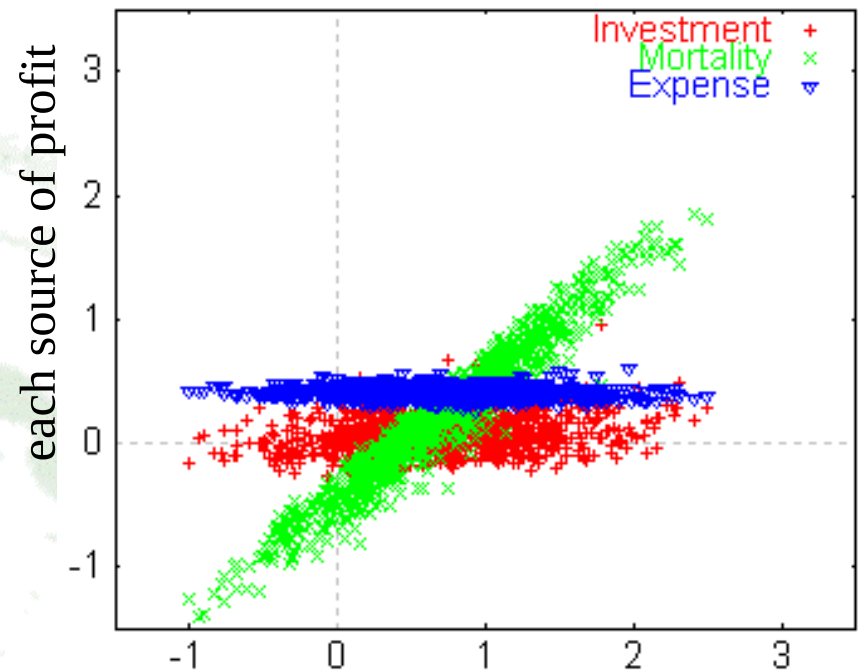
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5.2 Relation between Sources of Profit and Total Profit



total profit and loss

Endowment insurance



total profit and loss

Term insurance

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6. Conclusion

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Thank You

- The End -



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