

Measuring the Degree of Market Concentration in Thailand Insurance Industry

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Abstract

This paper investigates market structure of life insurance and non-life insurance industry in Thailand. This paper uses the Concentration Ratio and the Herfindahl-Hirschman Index to measure the degree of market concentration. The paper also analyzes various data from all type of insurance premium, balance sheet and income statement to measure the concentration and competition trend.

An analysis of life insurance premium, group market is unconcentrated where as ordinary and industry markets are concentrated. As for the life insurance balance sheet and income statement are concentrated market. An analysis of non-life insurance premium, fire, marine and transportation and automobile markets are unconcentrated. As for the non-life insurance balance sheet and income statement are unconcentrated market. In terms of the same sub-categorized product, personal accident and health insurance have difference concentrate degree. Personal accident in life insurance is near monopoly and highly concentrated market while personal accident in non-life insurance is loose oligopoly and moderate concentrated market. Health insurance in life and non-life insurance are tight oligopoly and concentrated market.

The results conclude that the life insurance industry is more concentrated than the non-life insurance industry. In both segments of the insurance market, as well as in the overall insurance sector, there is a downward trend in market concentration, which indicates the success of the competition promoting process which allows a greater and better choice for customers.

Keywords: insurance industry, market structure, concentration measurement

1. Introduction

The insurance industry serves individuals and businesses with security products such as life insurance, health insurance, automobile and other liability coverage of non-life insurance. Moreover, insurance industry plays a major role in financial intermediation, thus enhancing a nation's financial and economic development.

Life insurance brings confidence and security for all income groups of society who may be affected by life's uncertainties. At the same time, health insurance has become increasingly important due to the rapidly growing elderly population and the advanced medical technology that enables people to have a longer life span. Developed countries such as the US, Europe, Japan and South Korea as well as developing countries such as Thailand are stepping into the aging society because the elderly population are growing at a faster rate than the child-bearing population. It is estimated that the elderly population in Thailand will increase to 8.0 million (11.9% of total population) in 2010, to 17.7 million (25.1% of total population) in 2030 (Office of the National Economic and Social Development Board, 2010). Thus, governments in most countries are making effort in encouraging the population to seek ways to increasing their savings through government bonds, real estate schemes and retirement plans and to boost confidence and security in the form of life and health insurance. With a reliable saving plan, our stable income can be fortified through a life insurance system that provides protection and secures our savings. If the individual learns to take advantage of a savings plan, the saving plan will help increase the country's savings and further lead to the nation's economic development and expansion.

Likewise, non-life insurance is beneficial to business and investment sectors of society who are inevitably faced with daily risks from unforeseen circumstances or natural disasters such as floods, hurricanes, tsunamis, fire, explosions, accidents arising from travel and carelessness. All these risks and financial damage can be alleviated

by reliable non-life insurance system.

As alluded to above, there were empirical studies that reveal the insurance industry in the term of insurance market structure. Jedlicka & Jumah (2006) analyze the Austrian insurance industry using insurance premium. The study finds a positive relationship between market share and profitability. The higher market concentration leads to higher market power and higher returns. Dumm & Macpherson (2006) examine insurance premium in Florida. The study finds that Florida insurance industry is highly concentrated that two companies have 50 percent of premiums and six companies have 99 percent of premiums in 2004. Glambotskaya (2009) studies the structure of the Belarusian insurance market by insurance premiums. The study finds that Belarusian insurance business concentration is very high. Herfindal-Hirshman index for the insurance sector in 2007, calculated on the written premiums, was 3540. The biggest share of the insurance market belongs to the state-owned insurers. Austin & Hungerford (2009) study the market structure of the health insurance industry in United State. The study finds that health insurance markets are highly concentrated. The concentrated markets lead to high premium and limit access to health insurance. All of the studies show insurance market having a high market share and high market power.

Past studies concentrated only on insurance premium. No study investigates in the part of balance sheet and income statement, in spite of the fact that these data are keys to the financial position. Thus, this paper use balance sheet and income statement to measure market structure. This study will determine all type of premium both of life and non-life insurance and learn more about balance sheet which include assets, liabilities and shareholder's equity and income statement which include revenue, expenditures and net profit for the most comprehensive and complete insurance market study. It is helpful to have an understanding of the current structure of the insurance industry and consider their future paths. This study is organized as follows: section 2 measures the degree of concentration in Thailand insurance industry; section 3 shows the results of market concentration in Thailand insurance industry; then section 4 presents conclusions of the study.

2. Method

A market is any arrangement in which buyers and sellers exchange goods or services at agreed-upon price and quantity. Market structure is implying the number and relative size of the producers in an industry. An industry's market structure is a reflection the similarity of products produced within the industry and the relative ease for new producers to enter the market. Market structure also determines the producers' competitive environment. Economists commonly categorize market structures into four basic types: perfect competition, monopoly, monopolistic competition, and oligopoly (Johnson & Stone, 1998).

The imperfect market such as monopolistic competition, oligopoly, and monopoly, which there are few sellers and differentiated products, results in some market power. On the opposite, perfect competition, a market structure characterized by a large number of small sellers supplying a homogeneous product incurs no market power. To consider size of firm and significant percentage of the market supply, there are two elements of market structure. They are concentration ratios and Herfindahl-Hirschman index.

The concentration ratio is the percentage of market share owned by the largest n firms in an industry. The largest firm concentration ratio is CR_1 . The most common concentration ratio is the four-firm concentration ratio (CR_4).

Let S_i denotes the output of each firms in an industry, ($i = 1, 2, 3 \dots n$), and S_T denotes the total output of all firms in the industry. Let firm i 's share of the total market output is $W_i = S_i/S_T$. Then the CR_4 is the fraction of total industry output produced by the four largest firms in the industry.

$$CR_4 = \frac{S_1 + S_2 + S_3 + S_4}{S_T}, CR_4 = \sum_{i=1}^4 W_i \quad (1)$$

Another measurement is Herfindahl-Hirschman index (HHI). The HHI is the sum of the squared market shares of firms in the industry, multiplied by 10 000 to eliminate the decimals. Then the Herfindahl-Hirschman index is

$$HHI = 10,000 \left[\left(\frac{S_1}{S_T} \right)^2 + \left(\frac{S_2}{S_T} \right)^2 + \dots + \left(\frac{S_n}{S_T} \right)^2 \right], HHI = 10,000 \sum_{i=1}^n W_i^2 \quad (2)$$

The HHI measures the size of firms in relation to the industry, but also as an indication of the amount of competition. If HHI decrease it is interpreted as a loss of market power and at the same time an increase in competition.

Table 1. Classifying industries with the CR₁, CR₄, and HHI

CR ₄	HHI	Interpretation of Market Structure
CR ₄ = 0	HHI = 0	Perfect Competition
0 < CR ₄ < 40	HHI < 1000	Effective Competition or Monopolistic Competition, Unconcentrated
40 ≤ CR ₄ < 60	1000 ≤ HHI < 1800	Loose Oligopoly or Monopolistic Competition, Moderately concentrated
60 ≤ CR ₄ < 90	1800 ≤ HHI < 2500	Tight Oligopoly, Concentrated
90 ≤ CR ₄	2500 ≤ HHI < 9999	Effective Monopoly (near monopoly), Highly concentrated
CR ₁ = 100	HHI = 10 000	Monopoly

Source: Lipczynski et al. (2005, p. 215)

Table 2. Comparison of market structures

Type or Market Structure	Power to set supply and price	Number of sellers	Level of product differentiation	Number of barriers to entry
Monopoly	High	One	Unique	Many
Oligopoly	Some	Few	Either differentiated or homogeneous	Many
Monopolistic Competition	Very little	Many	Differentiated	Few
Perfect Competition	None	Very many	Homogeneous	None

Source: Johnson and Stone (1998, p. 64)

3. Results

The prevailing method of analyzing market structure is the measurement of concentration. This section focuses on life and non-life insurance industry in term of the CR₁ ratio, CR₄ ratio and Herfindahl-Hirschman index.

3.1 Life Insurance Industry

This part presents market concentration on life insurance premium, life insurance balance sheet and life insurance income statement

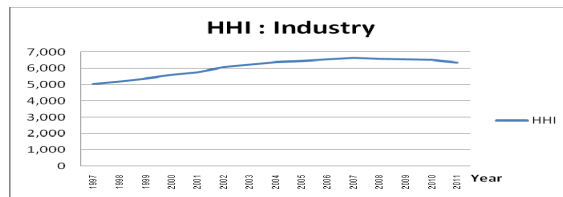
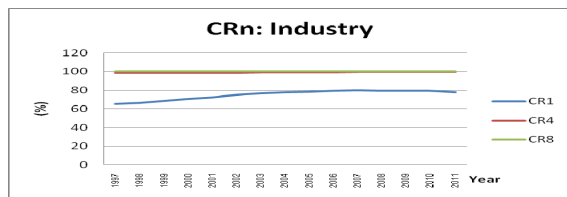
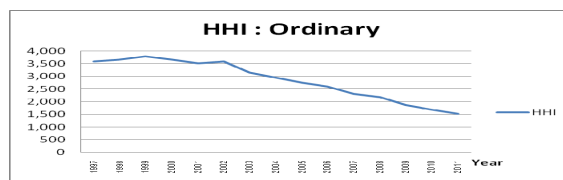
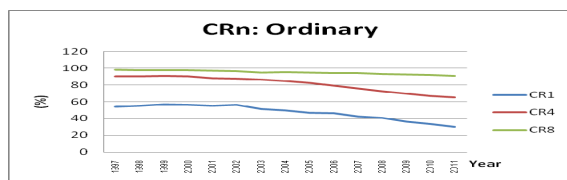
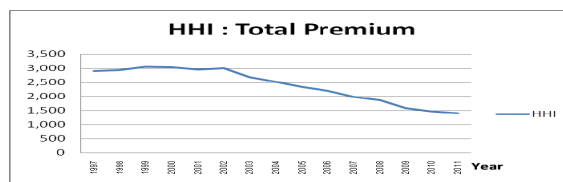
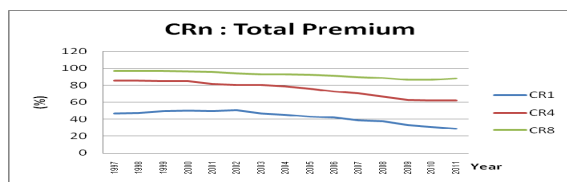
3.1.1 Market Concentration on Life Insurance Premium

Table 3. Market concentration on life insurance premium

Year	1997	1998	2010	2011	% increase (decrease)
1. Total Premium					
CR ₁	46.83 moderate market share	47.50 moderate market share	30.93 moderate market share	28.79 low market share	(6.91)
CR ₄	85.33 tight oligopoly	85.48 tight oligopoly	62.24 tight oligopoly	62.08 tight oligopoly	(0.26)
HHI	2900 highly concentrated	2941 highly concentrated	1470 moderate concentrated	1402 moderate concentrated	(4.63)
2. Ordinary premium					
CR ₁	54.3 high market share	55.13 high market share	33.54 moderate market share	30.29 moderate market share	(9.68)
CR ₄	90.13 near monopoly	90.56 near monopoly	67.11 tight oligopoly	65.45 tight oligopoly	(2.47)
HHI	3597 highly concentrated	3664 highly concentrated	1682 moderate concentrated	1522 moderate concentrated	(9.51)

Year	1997		1998		2010		2011	% increase (decrease)
3. Industry Premium								
CR ₁	65.08	high market share	66.61	high market share	79.27	high market share	78.04	high market share (1.55)
CR ₄	98.63	near monopoly	98.57	near monopoly	99.73	near monopoly	99.75	near monopoly 0.02
HHI	5046	highly concentrated	5196	highly concentrated	6516	highly concentrated	6348	highly concentrated (2.58)
4. Group Premium								
CR ₁	33.83	moderate market share	34.45	moderate market share	15.27	low market share	17.76	low market share 16.31
CR ₄	70.14	tight oligopoly	69.49	tight oligopoly	49.76	loose oligopoly	52.17	loose oligopoly 4.83
HHI	1738	moderate concentrated	1754	moderate concentrated	903	unconcentrated	958	unconcentrated 6.09
5. Personal Accident Premium								
CR ₁					74.55	high market share	74.45	high market share (0.14)
CR ₄		n. a.		n. a.	90.13	Near monopoly	91.76	Near monopoly 1.80
HHI					5664	highly concentrated	5662	highly concentrated (0.04)
6. Health Insurance Premium								
CR ₁	52.65	high market share	52.52	high market share	49.34	moderate market share	48.23	moderate market share (2.25)
CR ₄	92.18	Near monopoly	91.70	Near monopoly	83.79	Tight oligopoly	83.13	Tight oligopoly (0.79)
HHI	3583	Highly concentrated	3507	Highly concentrated	2906	Highly concentrated	2804	Highly concentrate (3.51)

Source: Calculated by author, using data from Office of Insurance Commission



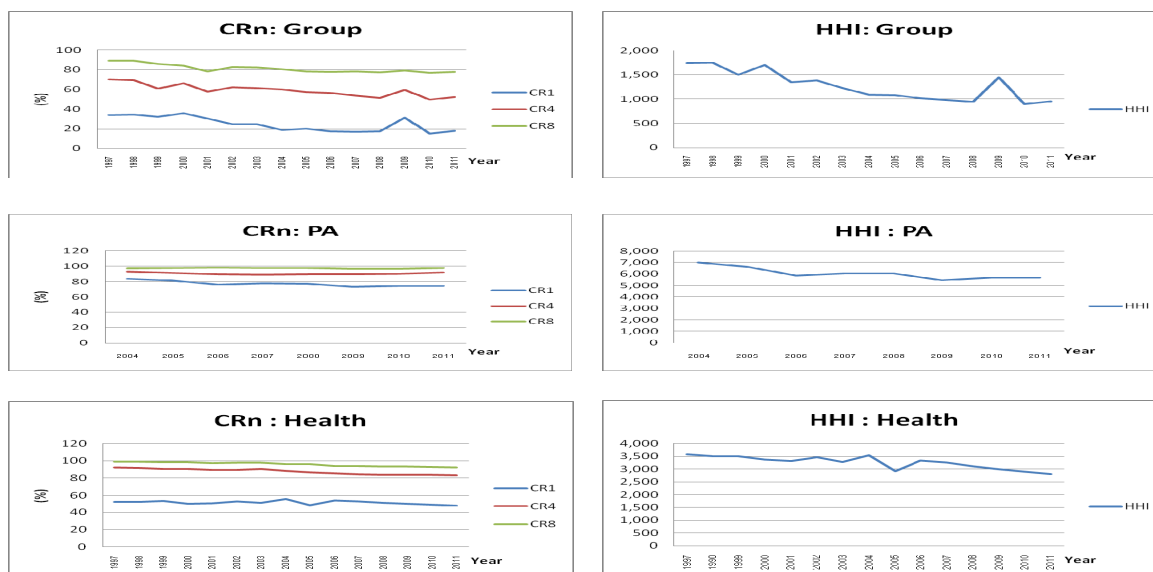


Figure 1. Market concentrations on direct life insurance premium

Source: Calculated by author, using data from Office of Insurance Commission

As shown in Table 3 and Figure 1, the life insurance industry in term of total premium indicates tight oligopoly and concentrated market with decreasing trend. The CR₄ and HHI of total premium are 62.08% and 1402, respectively, in 2011. Life insurance industry in Thailand has four sub-categorized products, including ordinary, industry, group, personal accident and health insurance product. The highest competition is group product and highest concentration is industry product. The CR₄ of group premium is 17.76 % and the CR₄ of industry premium is 78.04% in 2011. The HHI of group premium is 958 and the HHI of industry premium is 6348 in 2011.

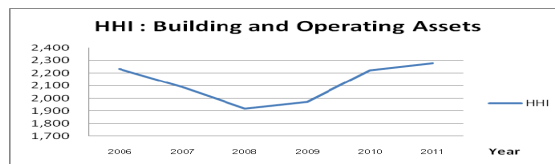
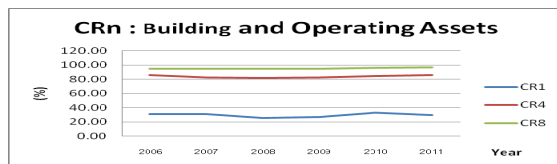
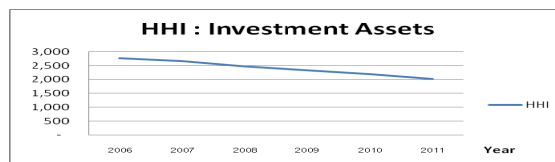
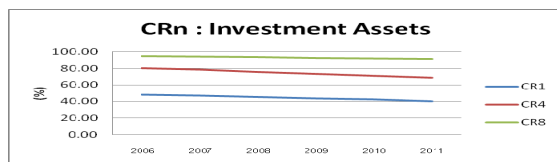
3.1.2 Market Concentration on Life Insurance Balance Sheet

Table 4. Market concentration on life insurance balance sheet

Year	2006	2007	2010	2011	% increase (decrease)
1. Investment Assets					
CR ₁	48.20 moderate market share	47.18 moderate market share	42.09 moderate market share	39.80 moderate market share	(5.43)
CR ₄	80.16 tight oligopoly	78.34 tight oligopoly	71.00 tight oligopoly	68.79 tight oligopoly	(3.12)
HHI	2771 highly concentrated	2668 highly concentrated	2195 concentrated	2023 concentrated	(7.83)
2. Building & Operating Assets					
CR ₁	31.12 moderate market share	31.02 moderate market share	33.39 moderate market share	29.98 low market share	(10.20)
CR ₄	85.86 tight oligopoly	82.28 tight oligopoly	84.82 tight oligopoly	85.74 tight oligopoly	1.08
HHI	2233 concentrated	2087 concentrated	2219 concentrated	2278 concentrated	2.65
3. Others Assets					
CR ₁	34.34 moderate market share	33.45 moderate market share	23.20 low market share	25.54 low market share	10.08

Year	2006	2007	2010	2011	% increase (decrease)				
CR ₄	66.97	tight oligopoly	65.33	tight oligopoly	60.48	tight oligopoly	60.92	tight oligopoly	0.72
HHI	1690	moderate concentrated	1626	moderate concentrated	1207	moderate concentrated	1294	moderate concentrated	7.22
4. Total Asset									
CR ₁	47.10	moderate market share	46.13	moderate market share	40.96	moderate market share	38.82	moderate market share	(5.22)
CR ₄	79.50	tight oligopoly	77.73	tight oligopoly	70.39	tight oligopoly	68.41	tight oligopoly	(2.81)
HHI	2677	highly concentrated	2580	highly concentrated	2115	concentrated	1962	concentrated	(7.25)
5. Policy Liabilities									
CR ₁	42.70	moderate market share	41.42	moderate market share	37.93	moderate market share	34.57	moderate market share	(8.86)
CR ₄	78.86	tight oligopoly	76.75	tight oligopoly	69.10	tight oligopoly	66.15	tight oligopoly	(4.27)
HHI	2380	concentrated	2265	concentrated	1929	concentrated	1718	moderate concentrated	(10.91)
6. Other Liabilities									
CR ₁	58.90	high market share	59.17	high market share	45.88	moderate market share	40.03	moderate market share	(12.76)
CR ₄	82.69	tight oligopoly	79.99	tight oligopoly	66.89	tight oligopoly	64.23	tight oligopoly	(3.98)
HHI	3706	highly concentrated	3707	highly concentrated	2370	concentrated	1953	concentrated	(17.59)
7. Capital Funds									
CR ₁	68.69	high market share	68.20	high market share	57.25	high market share	53.03	high market share	(22.79)
CR ₄	87.12	tight oligopoly	88.49	tight oligopoly	81.28	tight oligopoly	79.22	tight oligopoly	(9.07)
HHI	4868	highly concentrated	4817	highly concentrated	3524	highly concentrated	3109	highly concentrated	(36.13)

Source: Calculated by author, using data from Office of Insurance Commission



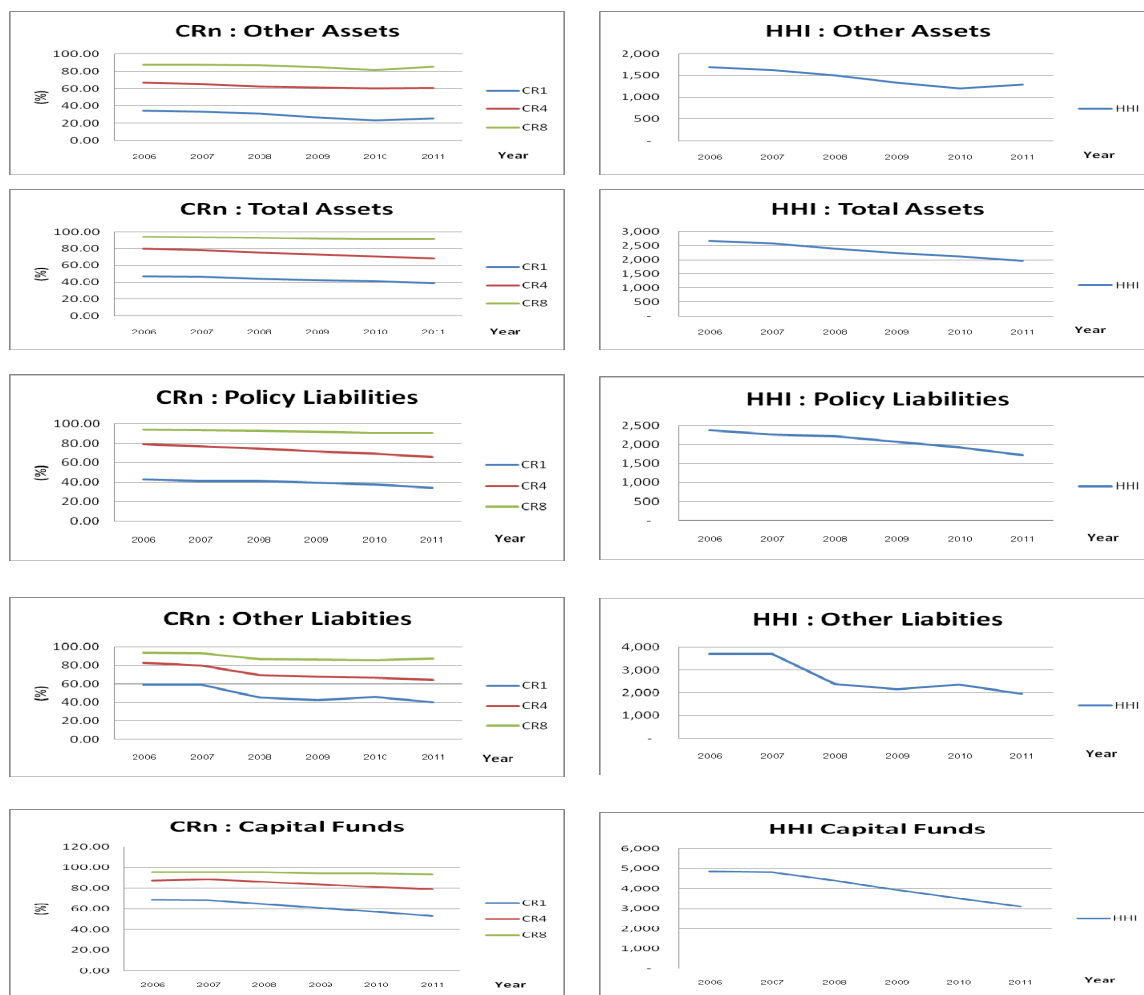


Figure 2. Market concentration on life insurance balance sheet

Source: Calculated by author, using data from Office of Insurance Commission

As shown in Table 4 and Figure 2, the life insurance balance sheet is tight oligopoly and concentrated. The CR₄ and HHI of investment asset are 68.79% and 2023, respectively, in 2011. The CR₄ and HHI of total asset are 68.41% and 1962, respectively, in 2011. The CR₄ and HHI of policy liabilities are 66.15% and 1718, respectively, in 2011. The CR₄ and HHI of capital funds are 79.22% and 3109, respectively, in 2011.

3.1.3 Market Concentration on Life Insurance Income Statement

Table 5. Market concentration on life insurance income statement

Year	2006	2007	2010	2011	% increase (decrease)
1. Net Written Premiums					
CR1	41.87	38.74	30.95	28.82	(6.87)
	moderate market share	moderate market share	moderate market share	low market share	
CR4	72.70	70.45	62.48	62.21	(0.44)
	tight oligopoly	tight oligopoly	tight oligopoly	tight oligopoly	
HHI	2211	1992	1476	1407	(4.72)
	concentrated	concentrated	moderate concentrated	moderate concentrated	
2. Net Investment Income & Other Income					
CR1	52.26	49.36	43.82	39.70	(9.42)
	high market share	moderate market share	moderate market share	moderate market share	

Year	2006		2007		2010		2011		% increase (decrease)
CR4	81.75	tight oligopoly	80.06	tight oligopoly	72.36	tight oligopoly	69.18	tight oligopoly	(4.40)
HHI	3103	highly concentrated	2849	highly concentrated	2338	concentrated	2036	concentrated	(12.91)
3. Total Income									
CR1	43.60	moderate market share	40.46	moderate market share	32.93	moderate market share	30.52	moderate market share	(7.31)
CR4	73.73	tight oligopoly	71.66	tight oligopoly	63.79	tight oligopoly	63.27	tight oligopoly	(0.80)
HHI	2340	concentrated	2111	concentrated	1580	moderate concentrated	1483	moderate concentrated	(6.18)
4. Life Policy Reserve									
CR1	33.96	moderate market share	32.98	moderate market share	24.47	low market share	20.39	low market share	(16.67)
CR4	68.70	tight oligopoly	66.86	tight oligopoly	60.05	tight oligopoly	62.67	tight oligopoly	4.36
HHI	1755	moderate concentrated	1649	moderate concentrated	1237	moderate concentrated	1208	moderate concentrated	(2.40)
5. Benefit Payments During the Year									
CR1	48.87	moderate market share	43.77	moderate market share	39.76	moderate market share	38.00	moderate market share	(4.43)
CR4	80.55	tight oligopoly	79.07	tight oligopoly	72.88	tight oligopoly	71.75	tight oligopoly	(1.55)
HHI	2911	highly concentrated	2527	highly concentrated	2137	concentrated	2015	concentrated	(5.72)
6. Dividends									
CR1	64.90	high market share	55.47	high market share	33.40	moderate market share	31.66	moderate market share	(5.20)
CR4	96.75	near monopoly	95.43	near monopoly	93.81	near monopoly	97.43	near monopoly	3.87
HHI	4717	highly concentrated	3807	highly concentrated	2381	concentrated	2492	concentrated	4.66
7. Salary and Brokerages									
CR1	44.88	moderate market share	45.51	moderate market share	24.16	low market share	37.02	moderate market share	53.21
CR4	72.79	tight oligopoly	71.45	tight oligopoly	60.71	tight oligopoly	69.56	tight oligopoly	14.58
HHI	2413	concentrated	2425	concentrated	1230	moderate concentrated	1855	concentrated	50.78
8. Total Expense									
CR1	40.61	moderate market share	37.88	moderate market share	31.53	moderate market share	29.52	low market share	(6.38)
CR4	71.82	tight oligopoly	69.23	tight oligopoly	62.21	tight oligopoly	61.84	tight oligopoly	(0.599)
HHI	2120	concentrated	1931	concentrated	1494	moderate concentrated	1421	moderate concentrated	(4.89)
9. Profit from Operation									
CR1	68.57	high market share	62.76	high market share	44.93	moderate market share	38.98	moderate market share	(13.25)
CR4	87.15	tight oligopoly	86.26	tight oligopoly	75.51	tight oligopoly	74.43	tight oligopoly	(1.43)
HHI	4864	highly concentrated	4196	highly concentrated	2487	concentrated	2099	concentrated	(15.58)

Source: Calculated by author, using data from Office of Insurance Commission

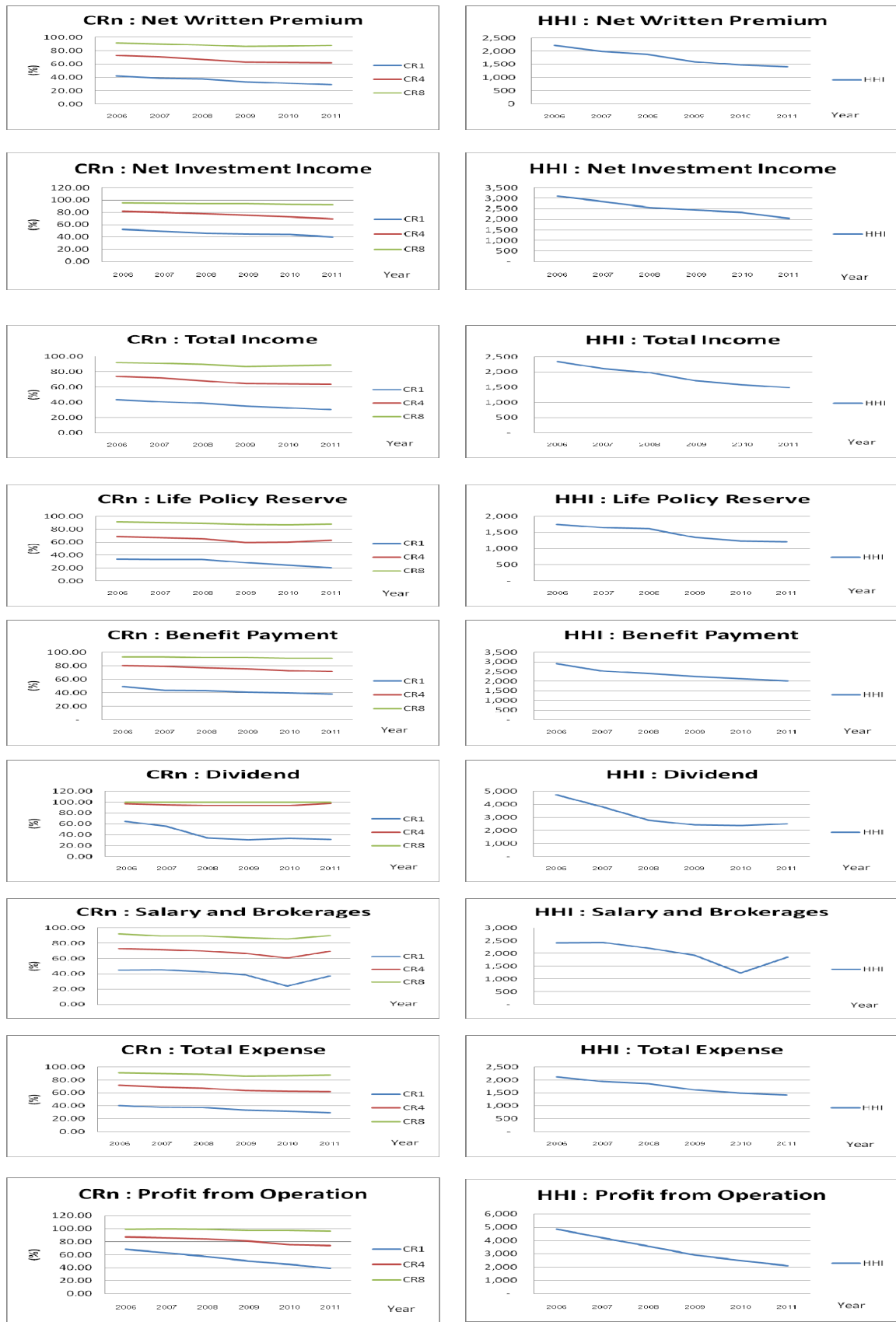


Figure 3. Market concentration on life insurance income statement

Source: Calculated by author, using data from Office of Insurance Commission

As shown in Table 5 and Figure 3, the life insurance income statement is tight oligopoly and concentrated. The CR₄ and HHI of net written premium are 62.21% and 1407, respectively, in 2011. The CR₄ and HHI of life policy reserve are 62.67% and 1208, respectively, in 2011. The CR₄ and HHI of profit from operation are 74.43% and 2099, respectively, in 2011.

3.2 Non-Life Insurance Industry

This part presents market concentration on non-life insurance premium, non-life insurance balance sheet and non-life insurance income statement.

3.2.1 Market Concentrations on Non-Life Insurance Premium

Table 6. Market concentration on non-life insurance premium

Year	1997		1998		2010		2011		% increase (decrease)
1. Total Premium									
CR1	13.13	low market share	12.27	low market share	16.15	low market share	15.51	low market share	(3.94)
CR4	34.08	monopolistic	31.50	monopolistic	36.71	monopolistic	37.03	monopolistic	0.88
HHI	467	unconcentrated	419	unconcentrated	533	unconcentrated	531	unconcentrated	(0.38)
2. Fire Premium									
CR1	12.18	low market share	12.09	low market share	16.15	low market share	12.74	low market share	(21.13)
CR4	32.15	monopolistic	32.18	monopolistic	36.71	monopolistic	42.56	loose oligopoly	15.94
HHI	435	unconcentrated	429	unconcentrated	533	unconcentrated	640	unconcentrated	20.08
3. Marine and Transportation Premium									
CR1	11.42	low market share	10.93	low market share	14.57	low market share	12.93	low market share	(11.28)
CR4	33.63	monopolistic	33.90	monopolistic	42.18	loose oligopoly	39.81	monopolistic	(5.61)
HHI	475	unconcentrated	471	unconcentrated	648	unconcentrated	585	unconcentrated	(9.72)
4. Automobile Premium									
CR1	20.35	low market share	20.13	low market share	24.92	low market share	23.98	low market share	(3.78)
CR4	50.02	loose oligopoly	43.58	loose oligopoly	42.61	loose oligopoly	41.74	loose oligopoly	(2.03)
HHI	821	unconcentrated	734	unconcentrated	858	unconcentrated	828	unconcentrated	(3.50)
5. Personal Accident Premium									
CR1			45.71	moderate market share	19.58	low market share	26.32	low market share	34.43
CR4		n.a.	62.68	tight oligopoly	50.76	loose oligopoly	53.09	loose oligopoly	4.60
HHI			2244	concentrated	944	unconcentrated	1109	moderate concentrated	17.48
6. Health Premium									
CR1			47.12	moderate market share	31.30	moderate market share	30.72	moderate market share	(1.87)
CR4		n.a.	77.18	tight oligopoly	60.54	tight oligopoly	61.23	tight oligopoly	1.14
HHI			2640	highly concentrated	1396	moderate concentrated	1369	moderate concentrated	(1.93)

Source: Calculated by author, using data from Office of Insurance Commission

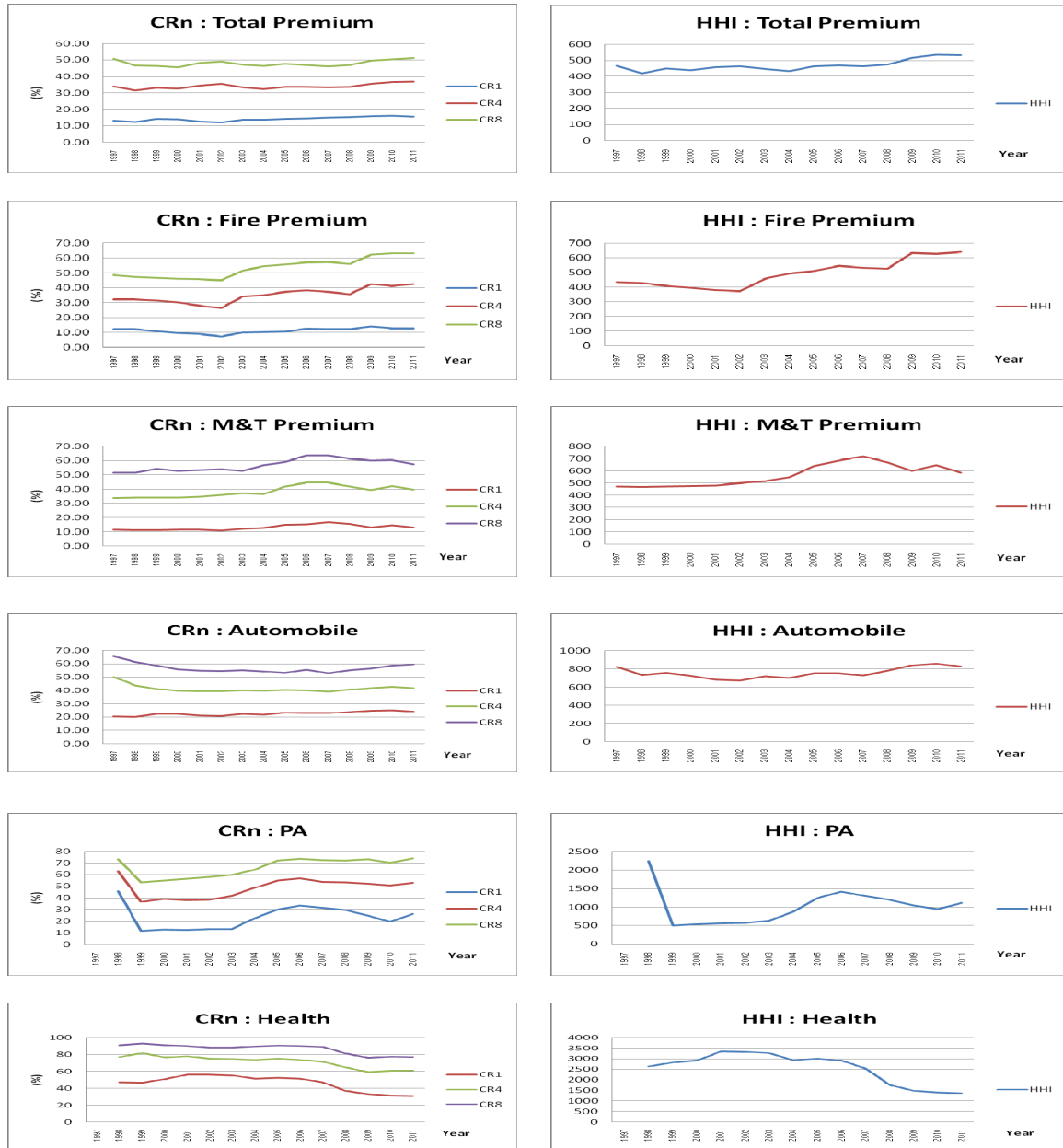


Figure 4. Market concentrations on direct non-life insurance premium

Source: Calculated by author, using data from Office of Insurance Commission

As shown in Table 6 and Figure 4, the non-life insurance industry in term of total premium indicates monopolistic competition and unconcentrated market. The CR₄ and HHI of total premium are 37.03% and 531, respectively, in 2011. Non-life insurance industry in Thailand has four sub-categorized products, including fire, marine and transportation, automobile, personal accident and health in miscellaneous insurance product. The highest concentration is health product. The CR₄ and HHI of health premium is 61.23% and 1369, respectively, in 2011. However, the HHI trend of the health market concentration slows down.

3.2.2 Market Concentrations on Non-Life Insurance Balance Sheet

Table 7. Market concentration on non-life insurance balance sheet

Year	2006		2007		2010		2011		% increase (decrease)	
1. Investment Assets										
CR1	16.74	low market share	16.47	low market share	14.89	low market share	16.03	low market share	7.64	
CR4	42.21	loose oligopoly	41.71	loose oligopoly	43.08	loose oligopoly	44.53	loose oligopoly	3.37	
HHI	631	unconcentrated	625	unconcentrated	641	unconcentrated	697	unconcentrated	8.63	
2. Building & Operating Assets										
CR1	13.92	low market share	13.36	low market share	18.09	low market share	13.47	low market share	(25.53)	
CR4	40.34	loose oligopoly	39.00	monopolistic	44.20	loose oligopoly	38.17	monopolistic	(13.66)	
HHI	614	unconcentrated	591	unconcentrated	721	unconcentrated	614	unconcentrated	(14.87)	
3. Others Assets										
CR1	10.96	low market share	11.20	low market share	17.67	low market share	24.48	low market share	38.53	
CR4	35.63	monopolistic	31.62	monopolistic	46.92	loose oligopoly	53.38	loose oligopoly	13.78	
HHI	460	unconcentrated	406	unconcentrated	768	unconcentrated	991	unconcentrated	29.12	
4. Total Asset										
CR1	15.23	low market share	14.65	low market share	15.54	low market share	19.56	low market share	25.87	
CR4	38.60	monopolistic	37.70	monopolistic	43.12	loose oligopoly	43.85	loose oligopoly	1.69	
HHI	545	unconcentrated	533	unconcentrated	638	unconcentrated	729	unconcentrated	14.16	
5. Policy Liabilities										
CR1	19.69	low market share	20.15	low market share	19.36	low market share	22.39	low market share	15.67	
CR4	39.94	monopolistic	39.55	monopolistic	42.10	loose oligopoly	50.30	loose oligopoly	19.46	
HHI	649	unconcentrated	649	unconcentrated	683	unconcentrated	880	unconcentrated	28.84	
6. Other Liabilities										
CR1	16.75	low market share	16.23	low market share	33.66	moderate market share	23.80	low market share	(29.30)	
CR4	36.97	monopolistic	35.21	monopolistic	52.45	loose oligopoly	41.83	loose oligopoly	(20.25)	
HHI	542	unconcentrated	519	unconcentrated	1,357	moderate concentrated	797	unconcentrated	(41.29)	
7. Capital Funds										
CR1	26.14	low market share	26.07	low market share	24.41	low market share	23.44	low market share	(10.31)	
CR4	48.37	loose oligopoly	49.15	loose oligopoly	47.43	loose oligopoly	54.14	loose oligopoly	11.92	
HHI	967	unconcentrated	971	unconcentrated	892	unconcentrated	1060	moderate concentrated	9.59	

Source: Calculated by author, using data from Office of Insurance Commission

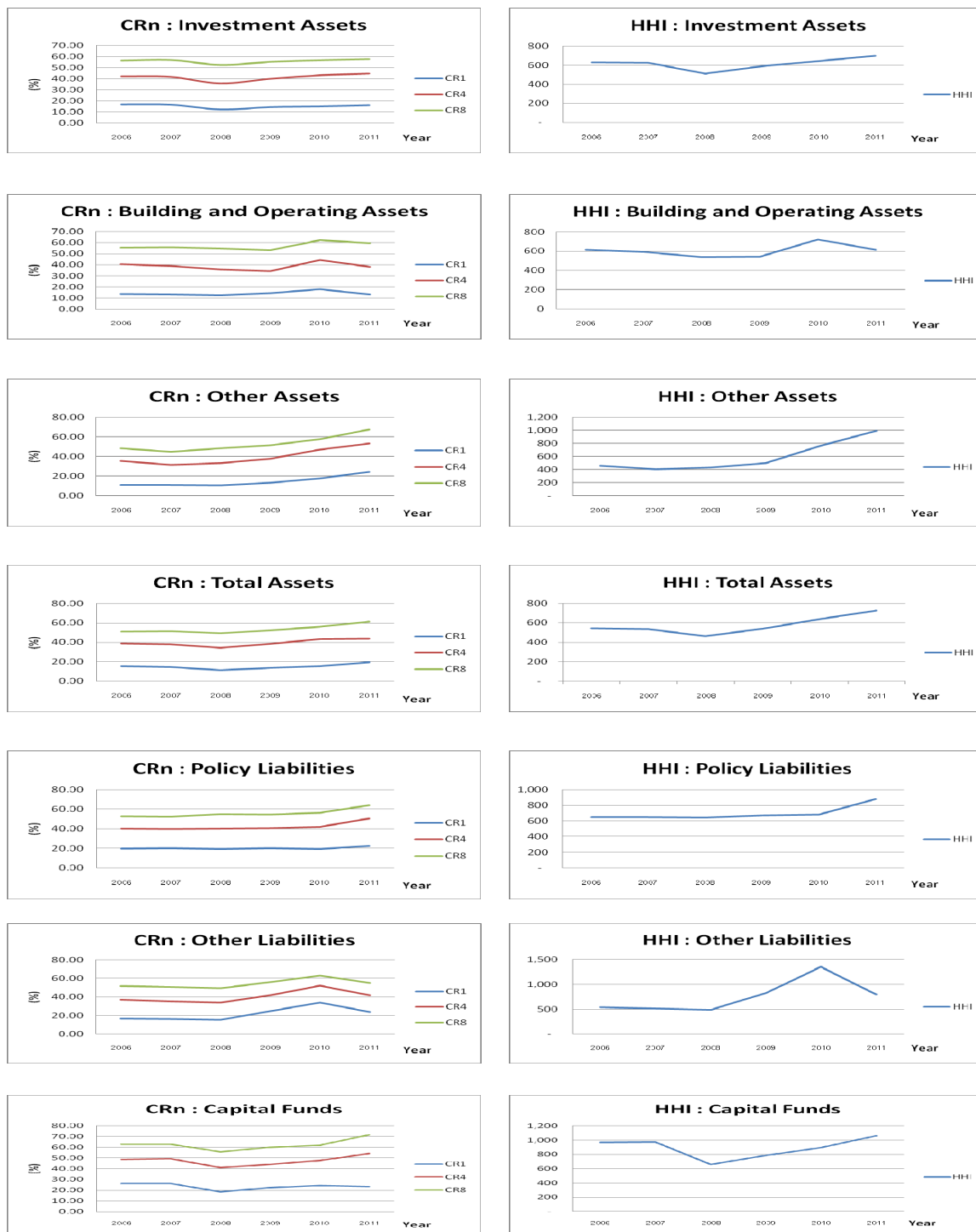


Figure 5. Market concentrations on non-life insurance balance sheet

Source: Calculated by author, using data from Office of Insurance Commission

As shown in Table 7 and Figure 5, the non-life insurance balance sheet is loose oligopoly and unconcentrated with increasing trend. The CR₄ and HHI of investment asset are 44.53% and 697, respectively, in 2011. The CR₄ and HHI of total asset are 43.85% and 729, respectively, in 2011. The CR₄ and HHI of policy liabilities are 50.30% and 880, respectively, in 2011. The CR₄ and HHI of capital funds are 23.44% and 1060, respectively, in 2011.

3.2.3 Market Concentrations on Non-Life Insurance Income Statement

Table 8. Market concentration on non-life insurance income statement

Year	2006			2007			2010			2011			% increase (decrease)
1. Earn Premiums													
CR1	18.98	low share	market	20.01	low share	market	20.48	low share	market	20.70	low share	market	1.08
CR4	35.56	monopolistic		36.58	monopolistic		38.09	monopolistic		38.23	monopolistic		0.38
HHI	575	unconcentrated		615	unconcentrated		655	unconcentrated		672	unconcentrated		2.64
2. Net Investment and other income													
CR1	13.22	low share	market	12.49	low share	market	18.78	low share	market	15.74	low share	market	(16.20)
CR4	36.03	monopolistic		34.59	monopolistic		49.71	loose oligopoly		44.20	loose oligopoly		(11.08)
HHI	517	unconcentrated		486	unconcentrated		793	unconcentrated		674	unconcentrated		(15.03)
3. Total Income													
CR1	18.46	low share	market	19.35	low share	market	19.86	low share	market	19.90	low share	market	0.17
CR4	35.22	monopolistic		36.03	monopolistic		37.51	monopolistic		37.66	monopolistic		0.39
HHI	558	unconcentrated		593	unconcentrated		635	unconcentrated		647	unconcentrated		1.84
4. Losses Incurred after Deduction													
CR1	21.65	low share	market	22.26	low share	market	21.36	low share	market	64.14	high share	market	200.36
CR4	39.67	monopolistic		40.70	loose oligopoly		39.09	monopolistic		76.23	tight oligopoly		95.03
HHI	687	unconcentrated		718	unconcentrated		695	unconcentrated		4193	highly concentrated		503.76
5. Commission and Brokerages													
CR1	26.14	low share	market	25.69	low share	market	29.03	low share	market	27.02	low share	market	(6.93)
CR4	46.21	loose oligopoly		46.52	loose oligopoly		50.76	loose oligopoly		48.58	loose oligopoly		(4.29)
HHI	934	unconcentrated		918	unconcentrated		1127	moderate concentrated		1016	moderate concentrated		(9.81)
6. Underwriting Expenses													
CR1	14.28	low share	market	15.63	low share	market	19.41	low share	market	18.36	low share	market	(5.40)
CR4	50.96	loose oligopoly		50.61	loose oligopoly		53.66	loose oligopoly		40.43	loose oligopoly		(24.65)
HHI	788	unconcentrated		801	unconcentrated		946	unconcentrated		695	unconcentrated		(26.56)

Year	2006	2007	2010	2011	% increase (decrease)				
7. Operating Expenses									
CR1	13.2 9	low market share	13.5 5	low market share	13.81	low market share	14.5 0	low market share	5.03
CR4	26.0 7	monopolistic	25.5 8	monopolistic	28.45	monopolistic	29.8 7	monopolistic	5.00
HHI	367	unconcentrate d	370	unconcentrate d	404	unconcentrate d	429	unconcentrated	6.26
8. Total Expense									
CR1	19.9 2	low market share	20.3 1	low market share	20.65	low market share	52.8 6	high market share	155.96
CR4	36.6 1	monopolistic	37.1 8	monopolistic	37.09	monopolistic	68.0 1	tight oligopoly	83.36
HHI	606	unconcentrate d	623	unconcentrate d	645	unconcentrate d	2927	highly concentrated	353.62
9. Profit from Operation									
CR1	12.9 9	low market share	11.2 2	low market share	16.55	low market share	22.9 2	low market share	38.44
CR4	40.3 5	loose oligopoly	39.2 1	monopolistic	41.92	loose oligopoly	63.1 2	tight oligopoly	50.58
HHI	618	unconcentrate d	613	unconcentrate d	678	unconcentrate d	1227	moderate concentrated	80.96

Source: Calculated by author, using data from Office of Insurance Commission



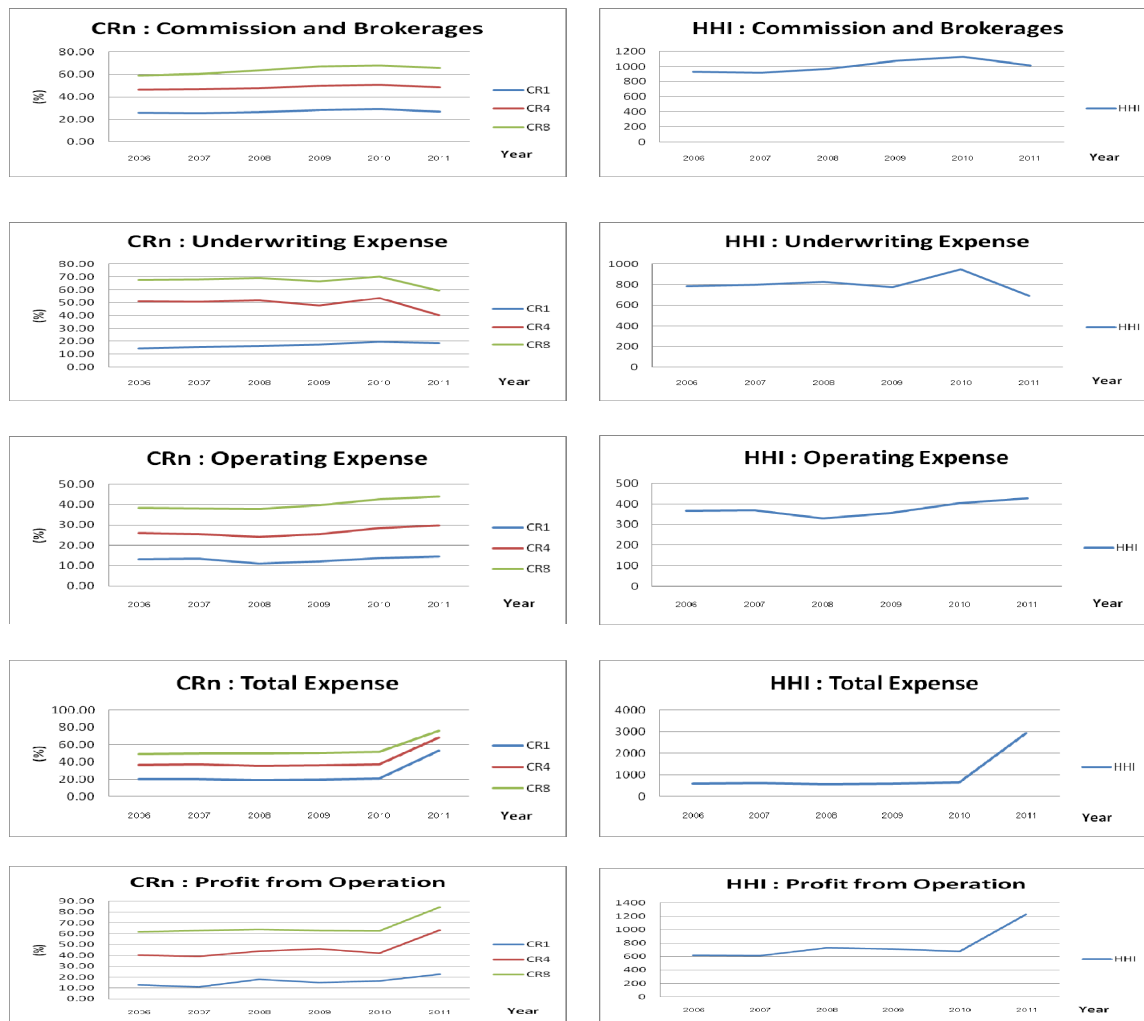


Figure 6. Market concentrations on non-life insurance income statement

Source: Calculated by author, using data from Office of Insurance Commission

As shown in Table 8 and Figure 6, the non-life insurance income statement in term of earn premium is monopolistic competition and unconcentrated whereas profit from operation is tight oligopoly and concentrated with increasing trend. The CR₄ and HHI of earn premiums are 38.23% and 672, respectively, in 2011. The CR₄ and HHI of total asset are 68.41% and 1962, respectively, in 2011. The CR₄ and HHI of policy liabilities are 66.15% and 1718, respectively, in 2011. The CR₄ and HHI of profit from operation are 63.12% and 1227, respectively, in 2011.

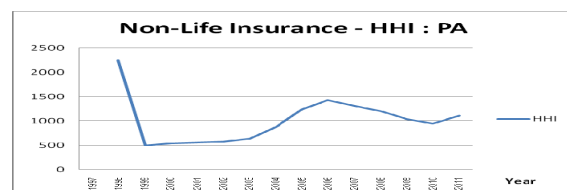
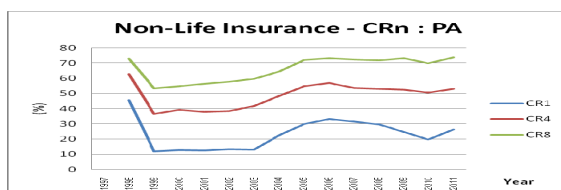
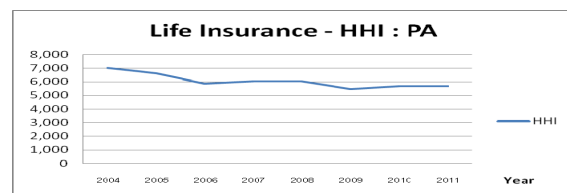
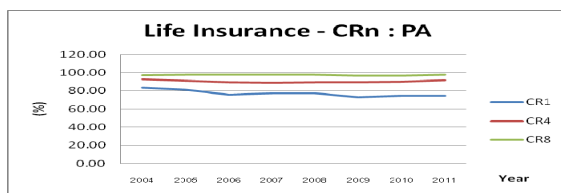
3.3 Comparative on Personal Accident (PA) and Health between Life and Non-Life Insurance

This part presents market concentration on the same sub-categorized product in life and non-life industry as personal accident and health insurance.

Table 9. Comparative on PA and Health between life and non-life insurance

Year	2004	2005	2010	2011	% increase (decrease)
1. Personal Accident Premium					
1.1 Life Insurance					
CR1	83.52 high market share	81.13 high market share	74.55 high market share	74.45 high market share	(0.14)
CR4	92.96 near monopoly	90.98 near monopoly	90.13 near monopoly	91.76 near monopoly	1.80
HHI	7016 highly concentrated	6629 highly concentrated	5664 highly concentrated	5662 highly concentrated	(0.04)
1.2 Non-Life Insurance					
CR1	22.37 low market share	30.02 moderate market share	19.58 low market share	26.32 low market share	34.43
CR4	48.42 loose oligopoly	54.86 loose oligopoly	50.76 loose oligopoly	53.09 loose oligopoly	4.60
HHI	878 unconcentrated	1241 moderate concentrated	944 unconcentrated	1109 moderate concentrated	17.48
2. Health Premium					
2.1 Life Insurance					
CR1	55.79 high market share	48.72 moderate market share	49.34 moderate market share	48.23 moderate market share	(2.24)
CR4	88.35 tight oligopoly	86.64 tight oligopoly	83.79 tight oligopoly	83.13 tight oligopoly	(0.79)
HHI	3543 highly concentrated	2914 highly concentrated	2906 highly concentrated	2804 highly concentrated	(3.51)
2.2 Non-Life Insurance					
CR1	51.52 high market share	52.24 high market share	31.30 moderate market share	30.72 moderate market share	(1.87)
CR4	73.58 tight oligopoly	74.96 tight oligopoly	60.54 tight oligopoly	61.23 tight oligopoly	1.14
HHI	2941 highly concentrated	3008 highly concentrated	1396 moderate concentrated	1369 moderate concentrated	(1.93)

Source: Calculated by author, using data from Office of Insurance Commission



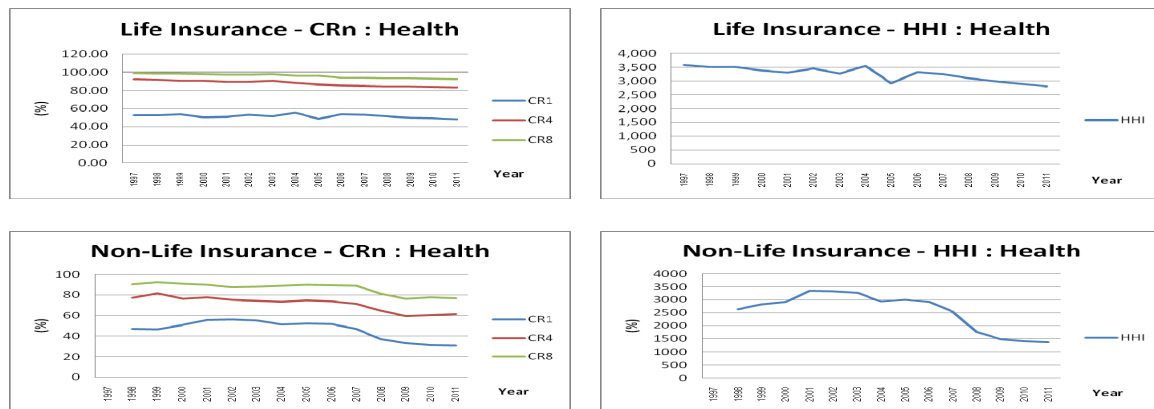


Figure 7. Market concentration on PA and health insurance

Source: Calculated by author, using data from Office of Insurance Commission

As shown in Table 9 and Figure 7, the same sub-categorized product, PA and health, in life and non-life industry have difference concentrate degree. PA in life insurance is near monopoly and highly concentrated market while PA in non-life insurance is loose oligopoly and moderate concentrated market. The CR₄ and HHI of PA in life insurance are 91.76% and 5662, respectively, in 2011. The CR₄ and HHI of PA in non-life insurance are 53.09% and 1109, respectively, in 2011. Health in life and non-life insurance are the same, tight oligopoly that concentrate on large four firm. The CR₄ and HHI of health in life insurance are 83.13 % and 2804, respectively, in 2011. The CR₄ and HHI of health in non-life insurance are 61.23% and 1369, respectively, in 2011. Health in life is more concentrated than health in non-life insurance. However, the trend of the health market concentration slows down that more competition in life and non-life insurance industry.

4. Conclusions

Using concentration ratio and Herfindahl-Hirschman index, it can be concluded the life insurance industry in Thailand is tight oligopoly and moderately concentrated. There are 24 life insurance companies in Thailand. The CR₄ and HHI of total premium are 62.08% and 1402, respectively, in 2011. Life insurance industry in Thailand has four sub-categorized products including ordinary, industry, group, personal accident and health insurance. The highest competition is group product and the highest concentration is industry product. An analysis of life insurance balance sheet and income statement shows similar results which are concentrated. However, all of concentration trends are slowing down, non-price competition is likely to increase. Customers always buy insurance from insurance company which has reputation and good after-sales service.

Using concentration ratio and Herfindahl-Hirschman index, it can be concluded the non-life insurance industry is monopolistic competition and unconcentrated. There are 65 non-life insurance companies in Thailand. The CR₄ and HHI of total premium are 37.03% and 531, respectively, in 2011. Non-life insurance industry in Thailand has four sub-categorized product under fire, marine and transportation, automobile, personal accident and health in miscellaneous insurance. The fire, marine and transportation, automobile and personal accident insurance markets are unconcentrated where as health insurance market is moderate concentrated. An analysis of non-life insurance balance sheet and income statement show similar results which are unconcentrated market. However, all of trends are upward because some companies exit from the non-life insurance market. There are 74 companies, 73 companies, 73 companies, 71 companies, 69 companies and 68 companies in period from 2006 to 2011.

The same sub-categorized product in life and non-life industry, personal accident and health products have difference concentration degrees. Personal accident in life insurance is near monopoly while personal accident in non-life insurance is loose oligopoly. Health in life and non-life insurance have similar results, which are tight oligopoly. Consumers will purchase personal accident and health insurance from insurance company which has intensive hospital networks and good after-sales service to ensure getting the best treatment. Every company attempts to improve their service so all concentration trends slow down, leading to the reduction in market concentration in life and non-life insurance industry.

By concentration measurement, Concentration Ratio and the Herfindahl-Hirschman Index, this paper concludes that life insurance industry is more concentrated than non-life insurance industry. In both segments of the

insurance market, as well as in the overall insurance sector, there is a downward trend in market concentration, which indicates the success of the competition promoting process for benefiting consumers the most. However, alongside competition, it is necessary for government to conduct proper regulation in order to avoid adverse market situations.

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