

Risks and Returns of Listed Companies on the Stock Exchange of Thailand: Manufacturing Sector and Service Sector Evidence

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Abstract

The purpose of this research is to examine the relationship between risks and returns of service sector and manufacturing sector, which are major drivers to Thai GDP. This research used listed companies on the Stock Exchange of Thailand which have the highest group index as a sample group. The representative of manufacturing and service sector are a packaging group and commerce, respectively. The data of manufacturing sector and service sector were collected from Biznews database during 2014 – 2016. Market-based variables were employed to evaluate returns and Value at Risk. The coefficient of variation was also examined. The results showed that service sector provided higher return and lower risks than industrial sector during 2014 – 2016. Each sample companies had a variation of returns and risk due to two unsatisfactory situations: politic problem and the death of Thailand's King Bhumibol Adulyadej. To make a list of interested company for investment, the Coefficient of variation was performed and the list indicating the best choice for investment was the THIP, followed by Global and Beauty.

Keywords: Risk, Return, the Stock Exchange of Thailand

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1. Introduction

According to the office of National Economic and Social Development Board (NESDB) of Thailand (2016), the world economic growth rates gradually declined from 3.4 percent in 2014 to 3.2 percent in 2015 and to 3.1 percent in 2016. Interestingly, the United States as a advanced economics country had economic growth rates ranging from 2.4 percent to 1.6 percent during 2014 – 2016, which were lower than those of emerging markets and developing counties, which ranged from 4.6 percent to 4.2 percent. This might be because of the decline of real the US. gross domestic products (GDP) from 2.4 percent in 2014 to 1.6 percent in 2016. This phenomenon have led to the increase of economic growth rates in Asian countries and emerging markets and developing counties in the present day.

In 2011, Thailand was upgraded from a lower-middle income economy to an upper-middle income economy. This evidenced that Thailand had been one of successful countries in sustainability. The other evidence was that Thai poverty has reduced significantly from 67 percent to 11 percent during 1986 – 2014. However, average economic growth had slowed to 3.5 percent over 2005-2015 (World bank, 2017); in addition, it dropped to 3.2 percent in the third quarter of 2016 (KResearch (2016))

Aforetime, agriculture had been the traditional backbone of the Thai economy; however since globalisation era, manufacturing sector had eclipsed agriculture sector, ewflecting from providing more contribution to GDP. Thereafter, Thai government performed economic development policy by intertwining agriculture sector with manufacturing sector. According to Koonnathamdee (2013) pointed out that Thai economy driver started with agriculture, then shifted to manufacuring sector and finally would shift to service sector. Those sector contributed to Thai GDP differently during 2010 – 2015 as shown Table 1 below.

Table 1: Thailand's Three Major Sectors Contributing to GDP during 2010 – 2015

Year	2010	2011	2012	2013	2014	2015
Agriculture (% of GDP)	10.531	11.601	11.515	11.393	10.231	9.142
Manufacturing (% of GDP)	31.088	29.152	28.130	27.686	27.571	26.917
Service (% of GDP)	49.435	50.305	51.032	51.628	52.996	55.140

Source: The World Bank Data (2016)

From Table 1, service setor provided the most contribution to GDP during 2010 – 2015, implying that service has been the most significant driver of Thai economy, followed by manufacturing sector and agriculture sector.

Based on Finance views, author interested in the relationship between risks and returns of service sector and manufacturing sector, which are major drivers to Thai GDP. Additionally,

these issues might reflect from market stock prices of listed companies in both sectors. Thus, a research question of this paper is which industry sector provides the higher risks and returns. Thus, the paper aims to examine returns and risks of listed companies in the Stock Exchange of Thailand (SET) and to employ a comparison study. The author expects that the results of this paper might be helpful information for investors both individual and institution before making decision to invest in capital market.

2. Literature Review

2.1 Theory and Empirical Study

Rely on the aims of the paper, this study focused on two key factors: risk and return. This section starts with firms' risk and then followed by firms' returns as below.

2.1.1 Risk Aspect

The Modigliani & Miller theory stated that based on a perfect market the debt ratio does not impact on the firms' value (Eugene and Houston, 2009). The financial leverage theory demonstrates that more leverage leads to higher return and higher probability of financial distress. Generally, firms' risks normally have been measured based on accounting-based basis such as debt to equity ratio, time interest earn ratio and debt ratio. Many researchers employed those proxies in their research papers such as Mahfouz and Ahmed (2014) and Gup, Avram, Beal, Lambert, and Kolari (2007). Since financial crises, the viewpoints of firms' risk have been changed because most scholars have aimed to prevent the financial disaster from risks. Thus, risks should be measured from the forward-looking information which they incorporate (Chan-Lau & Sy, 2007) instead of historical information. As a result, market-based risk concept has been currently accepted among scholars and researchers. The market-based assessment tools have been developed in many methods such as Standard Deviation, Variance, Coefficient of Variation, Value at Risk (VaR) and Probability of Default (PD). This paper focused on VaR and to study financial market volatility by employing daily market price of common stocks.

The VaR is a risk instrument based on percentile approach, which is widely used among financial practitioners to measure maximum loss within a given time period for a given confidence level. The VaR method assumes a normal distribution for asset returns. The standard deviation of the relevant assets is used to compute VaR and then the z-score of the normal distribution, which based on the confidence level, is also employed.

2.1.2 Return Aspect

Similar to risk aspect, the proxies of return variables are employed in accounting-based basis and marketing-based basis. For the accounting-based basis, the popular proxies of return

are return on assets (ROA) and return on equity (ROE). Many researchers used these proxy variables in their studies such as Kleff and Weber (2008), Gropp and Heider (2010) and Thippayana (2014). Thereafter, the proxy of return variable has been modified by using both accounting data and market data such as market to book ratio or Tobin's q as shown in the papers of Octavia and Brown (2010). Similar to risk aspect, return based on market-based basis currently has been more favored among many researchers because this aspect involves in current firm's value. To keep consistency principle, this study employed returns based on market-based basis. Therefore, returns are performed from market price of share based on the context of risk measurement of financial assets due to gaining better statistical properties (Jorion, 2001). Many researchers such as Powell (2007) employed the market-based returns.

2.2 Industrial Sector

As shown in Section 1, manufacturing sector used to be a key factor on driving Thai GDP. However, during 2014 – 2016 the growth rate of manufacturing sector significantly declined from 6.9 percent to -0.2 percent (the Bank of Thailand, 2016). In this paper, author focused on the listed companies on the SET particularly in industry sector on November 2016, which was classified into six groups (with different group indexes): Automotive group (431.71), Industrial Materials and Machinery group (70.26), Paper and Printing Materials group (1,744.14), Petroleum (944.48), Packaging group (4,401.18) and Steel group (42.64) (the Stock Exchange of Thailand, 2016). As a result, this paper concentrated in packaging group due to providing the highest group indexes.

In spite of sluggish economy in Thailand, packaging sector had growth of sale volumes more than all industries. This might be packaging manufacturers eager to initiate new packaging to assist production manufacturers to capture consumers' interests and convenience. Additionally, packaging sector is expected to significantly grow in the future because of supporting from the major production industry competitors in the domestic market and also the more interest in value-added packaging. Generally, the food and beverages sector remains the key growth drivers of the domestic packaging industry.

Presently, the packaging group in the SET consisted of 17 listed companies; however, 5 companies were dropped from this study because of unavailable data. As a result, 12 listed companies were included as shown in Table 2 below.

2.3 Service Sector

Table 1 pointed out that currently service sector was a sector contributing to Thai GDP in line with Koonnathamdee (2013), who stated that Thai economy shifted from manufacturing sector to servicing sector. Likewise, labor force increased to 18 million people during 2003 – 2010,

especially in hotels and restaurants group, and construction group. The growth rate of total private service sector of Thailand ranged between 1.69 percent to -0.03 percent during 2003 – 2009, which were quite close to those of the total service sector, implying that most of the service units in Thailand were private service units. Similar to industrial sector, author focused on the listed companies on the SET particularly in service sector on November 2016, which consisted of six groups (with different group indexes): Commerce group (36,242.16), Health Care Service group (5,620.45), Media and Publishing group (56.81), Professional service group (340.96), Tourism and Leisure (592.32) and Transportation and Logistics (280.15) (the Stock Exchange of Thailand, 2016). Definitely, this paper focused on commerce because providing the highest of group indexes.

Currently, the commerce group consisted of 22 listed companies; however, 5 companies were excluded from this study because of unavailable data. As a result, 17 listed companies were included as shown in Table 2 below.

3. Data and Methodology

3.1 Data

The sample group of this paper was listed companies, particularly in packaging group and commerce group on the SET. The fiscal years from 2014 to 2016 were used. Data was collected from BizNews Database in terms of daily market price of common stock for computing market-based risk variable in terms of VaR and CV and return variable.

Based on available data, 12 out of 17 listed companies in packaging group and 17 out of 22 companies in commerce group were included in the paper as shown in Table 2 below.

Table 2: Listed Company Names Included in This Paper

No.	Packaging Group	Mnemonic
1	A.J. Plastic Public Company Limited	AJ
2	Crown Seal Public Company Limited	CSC
3	NEP Reality Industry Public Company Limited	NEP
4	Nippon Pack (Thailand) Public Company Limited	NPP
5	Poly Plex (Thailand) Public Company Limited	PTL
6	Srithai Superware Public Company Limited	SITHAI
7	Sahamitr Pressure Container Public Company Limited	SMPC
8	S. Pack and Print Public Company Limited	SPACK
9	Thai Film Industries Public Company Limited	TFI
10	Thantawan Industry Public Company Limited	THIP
11	Thai Metal Drum Manufacturing Public Company Limited	TMD
12	Thai Packaging and Printing Public Company Limited	TPP

No.	Commerce Group	Mnemonic
1	Beauty Community Public Company Limited	Beauty
2	Big C Supercenter Public Company Limited	BIG C
3	Berli Jucker Public Company Limited	BJC
4	COL Public Company Limited	COL
5	CP All Public Company Limited	CPALL
6	Communication and System Solution Public Company Limited	CSS
7	Siam Global House Public Company Limited	Global
8	Home Product Center Public Company Limited	Hmpro
9	IT City Public Company Limited	IT
10	Karmarts Public Company Limited	Kamart
11	Loxley Public Company Limited	Loxly
12	Siam Makro Public Company Limited	Makro
13	MC Group Public Company Limited	MC
14	Mega Lifesciences Public Company Limited	Mega
15	Mida Assets Public Company Limited	MIDA
16	Robinson Department Store Public Company Limited	Ro
17	Singer Thailand Public Company Limited	SIN

Source: The Stock Exchange of Thailand (2016)

3.2 Variable Measurement

As shown in research question, this paper aims to compare risk and return of securities of listed firms on the SET, particularly in packaging group from manufacturing sector and commerce group in service sector. Keeping concern in current situation, market-based basis were employed for risk and return calculation, leading to current situation. However, to gain more useful information, the CV was used to provide making decision information for investors. The details of market-based risk in regards to VaR and return (R_t) and CV were explained as following.

3.2.1 VaR Calculation

As described in Section 2.1.1, VaR is the fluctuation of daily market price of common stocks by using standard deviation (σ_x) under a given period and develop to maximum loss under a specific the confidence level. Thus, if the 95% confidence level is used, the distribution the z-score is 1.96. Then, VaR for a single asset can be calculated as below:

$$\text{VaR} = \text{z-score} \times (\sigma_x) \dots \dots \dots (1)$$

To gain helpful information for investors, coefficient of variation (CV) was computed. The core concept of CV is to comparison risk in terms of standard deviation against mean of return. Thus, the lower CV reflects lower risk based on the same mean return. The formula of CV is shown below.

$$CV_i = \frac{\sigma_x}{X} \dots\dots\dots(2)$$

3.2.3 Return Calculation

Normally, returns should be computed from daily market price to gain better statistical properties. Daily returns are calculated by using the logarithm of the ratio between current market price (P_t) of share and the previous market price (P_{t-1}) of share. The formula to calculate market-based return is shown below.

$$r_t = \ln \left(\frac{P_t}{P_{t-1}} \right) \dots\dots\dots(3)$$

Additionally, to reflect the current moving of market stock price this paper employed moving average technique to perform quarterly VaR and return during 2014 – 2016.

4. Research Results

4.1 Findings from Packaging group

After performing quarterly moving average of return, Table 3 shows the average returns of listed companies in packaging group as below.

As shown in Table 3, the moving average return of packaging group (PKG) during 2014 – 2016 was 0.000501 or 0.501 percent. To gain insights, six companies provided their performances above the average return. The SMPC provided the highest return at 0.002853, followed by THIP at 0.002076, and TPP at 0.001095. At the same period, NEP was the only company gaining loss at 0.001375.

Table 3: Quarterly Moving Average of Return of Packaging Group during 2014 – 2016

Year	1Q2014	2Q2014	3Q2014	4Q2014	1Q2015	2Q2015	3Q2015	4Q2015	1Q2016	2Q2016	3Q2016	4Q2016	Average
PKG	0.001775	0.002012	0.000892	-0.001146	-0.000500	-0.000298	-0.001780	-0.000624	0.001000	0.001892	0.001300	0.001494	0.000501
AJ	0.001554	0.000485	0.001078	-0.003714	-0.001862	-0.000415	-0.002904	-0.000136	0.001485	0.001352	0.000693	0.005704	0.000277
CSC	0.001276	-0.001276	0.000000	-0.000548	0.000548	0.000153	-0.000955	0.000485	-0.000238	0.000397	0.002061	-0.000279	0.000135
NEP	0.000000	0.001931	-0.001413	-0.003218	-0.003268	0.001521	-0.002527	-0.006279	0.000410	0.002052	-0.002797	-0.002913	-0.001375
NPP	0.004235	0.000000	0.004784	0.016130	-0.012887	-0.000898	0.001319	-0.004155	0.000026	-0.002029	-0.000648	0.000136	0.000501
PTL	0.001538	0.001704	0.002328	-0.004682	0.000000	0.000083	-0.003826	-0.003152	0.001046	0.005726	0.003102	0.002777	0.000554
SITHAI	0.004317	0.003526	0.002106	-0.002875	0.000929	0.000401	-0.001402	-0.000150	-0.000945	-0.000900	-0.000599	-0.000632	0.000315
SMPC	0.010885	0.005044	0.002762	0.001054	0.001899	-0.004674	-0.003594	0.004878	0.006792	0.002411	0.005361	0.001417	0.002853
SPACK	0.000148	0.000293	0.001121	-0.001562	0.001964	0.000129	-0.001498	-0.001039	0.000792	-0.000318	-0.000162	0.004836	0.000392
TFI	0.001413	0.004942	0.001086	-0.002615	0.000841	0.000236	-0.001740	-0.003260	0.001464	0.001250	-0.000770	0.001633	0.000373
THIP	0.003493	0.002745	0.003200	-0.001632	0.000623	0.005480	0.003063	-0.000588	0.001141	0.000068	0.003091	0.004227	0.002076
TMD	0.000000	0.001087	-0.000886	-0.001312	0.000386	0.000360	0.000615	-0.000257	0.000422	0.000405	0.000000	0.001032	0.000154
TPP	0.001572	0.001807	0.001464	0.004376	0.004833	0.000405	-0.002229	-0.001923	0.002476	-0.000538	0.001312	-0.000415	0.001095

The quarterly VaR at the 95% confidence level was performed in terms of moving average basis during 2014 – 2016. Table 4 presents the quarterly average VaRs of listed companies in packaging group as below.

Table 4 revealed that the moving average VaRs was 0.02255 or 2.255 percent during 2014 – 2016. Obviously, all companies in packaging group provided VaRs above its mean VaR of group, reflecting that each company had higher market risk than its group. This implied that the market risk of commerce group was diversified in line with Portfolio theory (Stephen, Randolph and Bradford, 2014). The highest VaRs of packaging group started with THIP (0.18135) followed by NEP (0.17338) and PTL (0.09826) respectively.

Table 4: Quarterly Moving Average of VaRs of Packaging Group during 2014 – 2016

Year	1Q2014	2Q2014	3Q2014	4Q2014	1Q2015	2Q2015	3Q2015	4Q2015	1Q2016	2Q2016	3Q2016	4Q2016	Average
PKG	0.02102	0.02362	0.01904	0.02155	0.02139	0.02071	0.02723	0.01785	0.01710	0.02267	0.02586	0.03257	0.02255
AJ	0.04468	0.03734	0.03424	0.02439	0.02407	0.03122	0.06588	0.04714	0.02555	0.05738	0.04159	0.08757	0.04342
CSC	0.04037	0.02841	0.01672	0.01759	0.03129	0.01200	0.01696	0.03021	0.01910	0.02601	0.02645	0.03158	0.02472
NEP	0.02459	0.03325	0.03037	0.05574	0.03456	0.06020	1.54912	0.05380	0.04456	0.06719	0.06488	0.06230	0.17338
NPP	0.05126	0.02858	0.07874	0.18365	0.10855	0.08312	0.35080	0.03940	0.04929	0.03397	0.05412	0.07107	0.09438
PTL	0.04989	0.05212	0.05099	0.03299	0.03982	0.03471	0.59947	0.03899	0.03446	0.08674	0.07796	0.08102	0.09826
SITHAI	0.02825	0.06448	0.04975	0.03602	0.04308	0.02695	0.48884	0.02772	0.02251	0.02066	0.01635	0.02112	0.07048
SMPC	0.06367	0.05673	0.03871	0.03718	0.02495	0.07134	0.30574	0.06515	0.09662	0.06537	0.04826	0.05063	0.07703
SPACK	0.03263	0.01754	0.04797	0.03446	0.14065	0.06270	0.30390	0.03564	0.02824	0.02369	0.01717	0.07922	0.06865
TFI	0.06678	0.05897	0.06324	0.08335	0.06510	0.03854	0.23435	0.03626	0.03811	0.05107	0.03132	0.06614	0.06944
THIP	0.04818	0.05221	0.04799	0.02544	0.02514	0.05332	1.75871	0.03386	0.03367	0.02006	0.04011	0.03750	0.18135
TMD	0.04442	0.03258	0.02201	0.01943	0.03280	0.02348	0.02412	0.02003	0.05016	0.01339	0.02396	0.01990	0.02719
TPP	0.03731	0.04167	0.05830	0.07429	0.37514	0.06035	0.06793	0.05518	0.05950	0.04361	0.05305	0.06285	0.08243

4.2 Findings from Commerce Group

Similar to packaging group, the quarterly average returns and VaRs of listed companies in commerce group were developed as shown in Table 5 and Table 6 below.

Table 5: Quarterly Moving Average of Return of Commerce Group during 2014 – 2016

Year	1Q2014	2Q2014	3Q2014	4Q2014	1Q2015	2Q2015	3Q2015	4Q2015	1Q2016	2Q2016	3Q2016	4Q2016	Average
Comm	0.00157	0.00219	0.00011	-0.00106	-0.00033	0.00068	0.00031	-0.00143	0.00189	0.00159	0.00129	0.00097	0.00065
Beauty	0.00051	0.00256	0.00464	0.00196	0.00387	-0.00064	0.00191	0.00359	0.00046	0.00680	0.00251	0.00316	0.00261
BIGC	0.00116	0.00201	0.00196	0.00071	-0.00049	-0.00259	0.00105	0.00016	0.00374	-0.00254	-0.00031	0.00024	0.00042
BJC	0.00086	-0.00069	0.00009	-0.00170	-0.00189	0.00078	-0.00106	0.00109	0.00187	0.00256	0.00221	0.00154	0.00047
COL	0.00401	0.00765	-0.00145	-0.00082	0.00321	-0.00242	-0.00615	0.00184	-0.00118	0.00223	-0.00356	-0.00063	0.00023
Cpall	0.00138	0.00219	-0.00063	-0.00085	-0.00059	0.00322	0.00061	-0.00364	0.00163	0.00199	0.00283	0.00040	0.00071
Css	0.00434	0.00329	0.00960	0.00131	0.00155	-0.00070	-0.00198	-0.00034	-0.00150	-0.00146	-0.00489	-0.00012	0.00076
Global	0.00230	-0.00097	0.00122	-0.00351	-0.00040	-0.00151	0.00494	-0.00350	0.00320	0.00686	0.00093	0.00375	0.00111
Hmpro	0.00217	0.00236	0.00132	-0.00188	-0.00019	-0.00203	0.00111	0.00024	0.00423	0.00329	0.00058	0.00000	0.00093
IT	0.00097	0.00168	0.00072	-0.00299	0.00094	0.00000	-0.00334	0.00000	0.00279	0.00064	-0.00090	0.00403	0.00038
Kamart	0.00101	0.00226	0.00246	-0.00119	0.00310	-0.00436	0.00363	0.00000	0.00063	0.00483	0.00403	0.00000	0.00137
Loxly	0.00223	0.00279	0.00125	-0.00295	-0.00047	-0.00245	-0.00515	-0.00199	0.00123	0.00102	0.00315	-0.00052	-0.00016
Makro	0.00176	0.00426	-0.00071	-0.00151	-0.00023	0.00173	-0.00021	-0.00122	-0.00107	-0.00012	-0.00037	0.00109	0.00028
MC	0.00624	0.00266	0.00027	-0.00587	0.00190	-0.00117	-0.00107	-0.00169	0.00173	0.00025	-0.00024	0.00172	0.00039
Mega	0.00187	0.00046	-0.00181	-0.00305	0.00114	0.00018	-0.00027	-0.00170	-0.00025	-0.00039	0.00212	0.00458	0.00024
MIDA	0.00318	0.00249	0.00075	0.00463	0.00339	-0.00404	-0.00015	-0.00275	0.00289	-0.00050	-0.00296	0.00020	0.00060
Ro	0.00260	0.00166	-0.00098	-0.00245	0.00089	-0.00080	-0.00277	0.00232	0.00373	0.00506	-0.00148	0.00100	0.00073
Sin	-0.00058	0.00336	-0.00215	-0.00581	-0.00039	0.00149	-0.00123	-0.00592	0.00019	0.00239	0.00000	0.00181	-0.00057

As shown in Table 5, the quarterly moving average return of commerce during 2014 – 2016 was 0.00065 or 0.65 percentage. To gain insights, seven companies provided their performances above the average return. The Beauty had the highest returns at 0.00261, followed by Kamart at 0.00137, and Global and Hmpro at 0.00111 and 0.00093 respectively. The Loxly and Sin were the only two companies, which gain Losses at 0.00016 and 0.00057 respectively.

Table 6 below revealed that the moving average VaRs was 0.01764 or 1.764 percent during 2014 – 2016. Similar to Packaging group, the mean VaR of commerce group was the lowest VaR due to a risk diversification, implying that each company provided VaRs above the average VaR as shown in Table 6. The top three of VaR were provided by Css (0.05876), Kamart (0.05191) and MIDA (0.05107).

Table 6: Quarterly Moving Average of VaRs of Commerce Group during 2014 – 2016

Year	1Q2014	2Q2014	3Q2014	4Q2014	1Q2015	2Q2015	3Q2015	4Q2015	1Q2016	2Q2016	3Q2016	4Q2016	Average
Comm	0.01730	0.01640	0.01200	0.01859	0.01533	0.01975	0.01939	0.01618	0.01942	0.01418	0.02240	0.02072	0.01764
Beauty	0.02677	0.03383	0.04477	0.05464	0.05450	0.03827	0.03798	0.04587	0.04381	0.04975	0.05487	0.05747	0.04521
BIGC	0.02627	0.02809	0.02769	0.04357	0.03092	0.03207	0.02272	0.02761	0.04678	0.02427	0.02004	0.01845	0.02904
BJC	0.03539	0.02630	0.04251	0.02817	0.03463	0.03901	0.02889	0.04091	0.05142	0.04685	0.05034	0.04067	0.03876
COL	0.04115	0.05160	0.03062	0.02546	0.03430	0.03631	0.03460	0.04129	0.02635	0.04041	0.02813	0.04028	0.03588
Cpall	0.02885	0.02496	0.01779	0.02887	0.02638	0.03448	0.02920	0.02797	0.04097	0.02559	0.03341	0.02575	0.02869
Css	0.04485	0.04636	0.09785	0.09321	0.06876	0.03694	0.05983	0.07165	0.04146	0.03806	0.04442	0.06174	0.05876
Global	0.04462	0.03363	0.04183	0.03001	0.04151	0.03681	0.04870	0.04248	0.05521	0.04746	0.04624	0.04285	0.04261
Hmpro	0.03558	0.02903	0.03118	0.02322	0.02946	0.02928	0.03471	0.03802	0.03525	0.02956	0.04736	0.03636	0.03325
IT	0.02608	0.03032	0.05038	0.03851	0.04136	0.02533	0.03750	0.03559	0.03719	0.03813	0.02325	0.08102	0.03872
Kamart	0.04594	0.04155	0.04183	0.03446	0.05351	0.03797	0.06832	0.05322	0.06476	0.04413	0.07475	0.06247	0.05191
Loxly	0.04978	0.04008	0.04480	0.04606	0.02874	0.02374	0.04423	0.03776	0.05042	0.02670	0.06222	0.05121	0.04214
Makro	0.02218	0.03157	0.01716	0.02096	0.01457	0.02939	0.02218	0.01925	0.02406	0.02045	0.02389	0.02541	0.02259
MC	0.03889	0.03133	0.03128	0.04670	0.03708	0.04023	0.04039	0.03213	0.03009	0.03191	0.03421	0.03564	0.03582
Mega	0.02921	0.03580	0.03119	0.02701	0.04876	0.02862	0.03573	0.01967	0.03309	0.02218	0.04874	0.05278	0.03440
MIDA	0.04116	0.04579	0.05452	0.10765	0.06435	0.04540	0.07003	0.04004	0.03220	0.03414	0.03020	0.04734	0.05107
Ro	0.03864	0.03077	0.02597	0.03743	0.03662	0.03358	0.03993	0.03027	0.04208	0.03301	0.04092	0.05194	0.03676
Sin	0.03444	0.03864	0.03984	0.04105	0.05533	0.04325	0.04926	0.04366	0.03358	0.05929	0.07146	0.05546	0.04711

4.3 Comparison aspects

To gain more insights, this paper included the comparison study between risk and return of top three companies, which provided the highest quarterly returns and VaRs of both groups. The results are shown in Table 7 below.

From Table 7 below, it is interesting that the commerce group provided the higher return (0.000649) and lower VaR (0.01764) than the return (0.000501) and VaR (0.022551) of packaging group during 2014 – 2016. This might be because commercial sector dealing with consumers' daily life leading to lesser impact from market risk.

Table7: Comparison between Returns and Risks of Listed Companies in Packaging and Commerce Group

Year		1Q2014	2Q2014	3Q2014	4Q2014	1Q2015	2Q2015	3Q2015	4Q2015	1Q2016	2Q2016	3Q2016	4Q2016	Average
PKG	Return	0.00177543	0.002012	0.0008924	-0.001146	-0.0005003	-0.000298	-0.0017804	-0.000624	0.0010001	0.0018917	0.0013004	0.001494	0.000501
	VaR	0.0210155	0.023619	0.0190406	0.021549	0.02139269	0.02071	0.0272258	0.0178549	0.0170989	0.0226717	0.0258595	0.032572	0.022551
SMPC	Return	0.01088509	0.005044	0.0027617	0.001054	0.00189933	-0.004674	-0.0035937	0.0048776	0.0067921	0.0024115	0.0053605	0.001417	0.002853
	VaR	0.06367061	0.05673	0.0387117	0.03718	0.02495466	0.071345	0.3057386	0.0651517	0.0966183	0.0653722	0.0482617	0.05063	0.07703
THIP	Return	0.00349333	0.002745	0.0031995	-0.001632	0.0006234	0.00548	0.0030626	-0.000588	0.0011409	6.816E-05	0.0030906	0.004227	0.002076
	VaR	0.04817513	0.052214	0.0479857	0.025437	0.02513803	0.053322	1.7587106	0.0338575	0.033671	0.0200595	0.0401144	0.037503	0.181349
TPP	Return	0.00157246	0.001807	0.0014639	0.004376	0.00483278	0.000405	-0.0022288	-0.001923	0.0024761	-0.0005375	0.0013122	-0.00042	0.001095
	VaR	0.03731326	0.041674	0.0583049	0.074288	0.37514336	0.060351	0.0679316	0.0551797	0.0595012	0.0436112	0.0530458	0.062846	0.082433
Comm	Return	0.00156524	0.00219	0.0001136	-0.001062	-0.0003295	0.000684	0.0003052	-0.001427	0.0018922	0.0015901	0.0012932	0.000974	0.000649
	VaR	0.01730304	0.016397	0.0119975	0.018592	0.01533269	0.019748	0.0193902	0.0161848	0.0194232	0.014185	0.0224021	0.02072	0.01764
Beauty	Return	0.00050705	0.002563	0.0046434	0.001955	0.00387012	-0.000637	0.0019128	0.003587	0.0004589	0.0067967	0.0025127	0.003158	0.002611
	VaR	0.02676851	0.033833	0.044767	0.054639	0.05449536	0.038273	0.0379785	0.0458655	0.0438094	0.0497508	0.0548738	0.057468	0.04521
KAMART	Return	0.00101435	0.002256	0.0024636	-0.001186	0.00310233	-0.004356	0.003628	9.029E-18	0.0006345	0.0048303	0.0040257	5.52E-18	0.001368
	VaR	0.04594328	0.041547	0.0418255	0.034458	0.05350713	0.037975	0.0683223	0.053225	0.0647632	0.0441269	0.0747484	0.062467	0.051909
Global	Return	0.00229869	-0.000969	0.0012246	-0.003513	-0.0004021	-0.001513	0.0049433	-0.003497	0.0032006	0.0068593	0.0009304	0.003749	0.001109
	VaR	0.04461774	0.033632	0.0418264	0.030007	0.04151265	0.036808	0.0486964	0.0424793	0.0552064	0.0474619	0.0462402	0.042852	0.042612

To gain insights, the even quarterly returns of each top three companies in both industry groups appeared in Table 4 are presented in bar chart as shown in Figure 1 below.

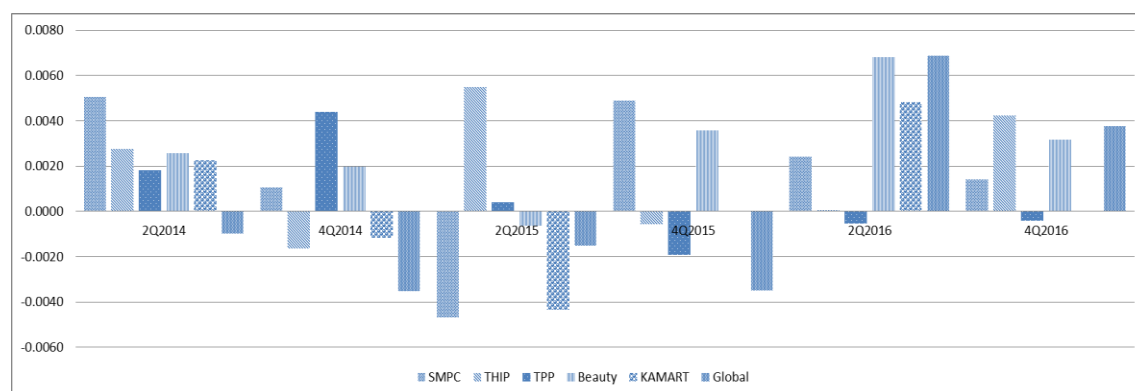


Figure 1: Comparison Semiannually Return of Top Three Companies in Packaging and Commerce group

Figure 1 showed that even quarterly returns of six companies of both groups fluctuated and provided in positive and negative returns during 2014 – 2016. Particularly, at the second quarter in 2014 most companies had positive returns, except the Global Company had a negative return. From the fourth quarter of 2014 until the end of 2015, it is obvious that the THIP (a packaging company) provided the highest positive return, whereas many companies gained losses during that period. This might be due to coup d'etat in Thailand. Interestingly, at the second quarter in 2016, the returns of companies in both groups were likely that they recovered to be positive returns, visibly the companies in commerce group as the Beauty, KAMART and Global. These evidences supported that services sector gradually a major factor impacting on Thai economy consistent with the Bank of Thailand (2016). Unsurprisingly, the unsatisfactory news, Thailand's King Bhumibol Adulyadej has passed away on October 13, 2016, brought about the decline in returns of all companies.

Similarly, the semiannually VaRs at 95 percent confidence level were compared between top three companies in both industry groups presented in bar chart as shown in Figure 2 below.

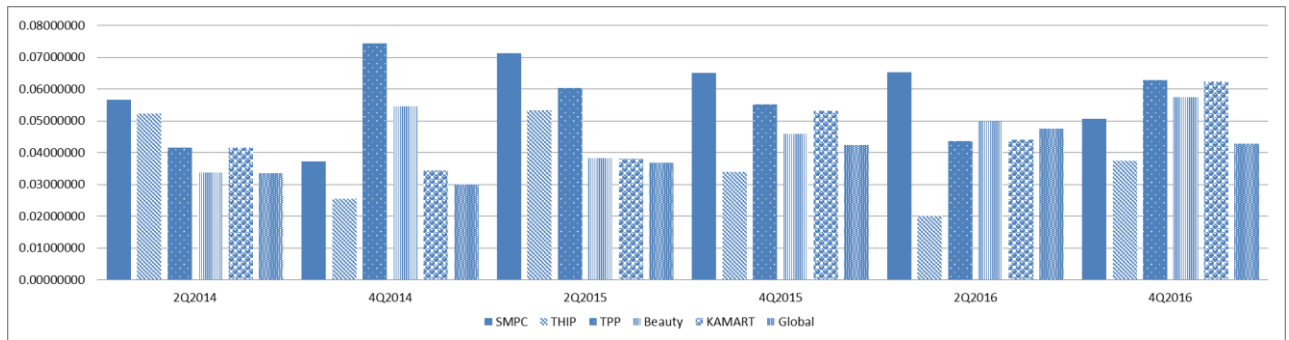


Figure 2: Comparison Semiannually VaRs of Top Three Companies in Packaging and Commerce Group

Figure 2 showed that the VaRs of six companies varied during 2014 – 2016. The TPP provided the highest VaR (0.0743) at the fourth quarter in 2014; whereas, THIP had the lowest VaRs (0.0201) at the second quarter in 2016. Obviously, the VaRs of packaging group were higher than those of commerce group due to more sensitive from market risk. Similar to returns, Thailand's King Bhumibol Adulyadej has passed away led to the increases in VaRs of all companies.

In regards to helpful investment information, the comparison between risks and returns of each company in the end of year 2016 was conducted in terms of line graph as shown in Figure 3 below.

Figures 3 demonstrated that the THIP had the lowest VaR; whereas, the TPP provided the highest return among the listed companies in packaging group. For commerce group, the Global and Beauty were more likely to provide similar returns; however, the Beauty had riskier than the other one. The TPP (a packing company) and the KAMART (a commerce company) which provided the lowest return and the highest risk among the listed companies in its group were dropped from the list of interested companies for investment.

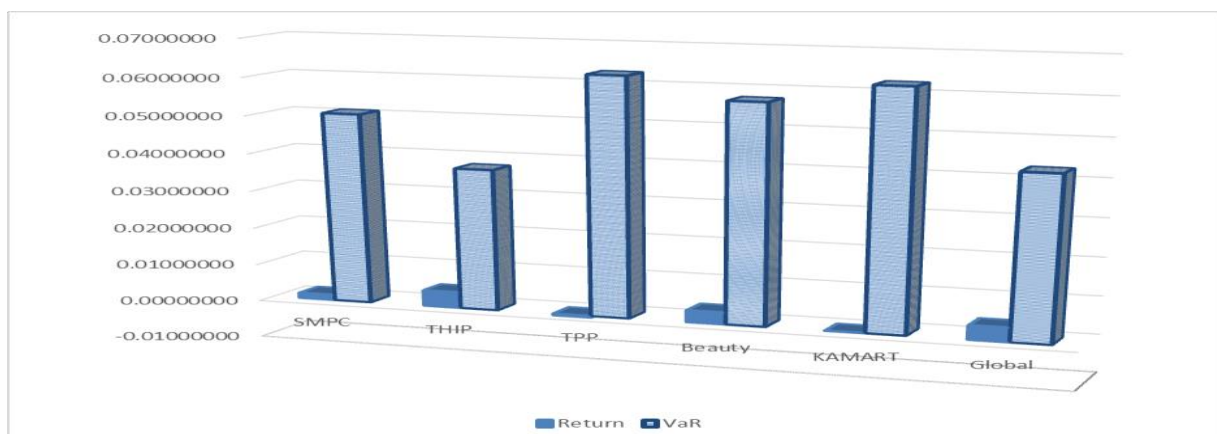


Figure 3: Comparison VaRs and Return of Six Companies at the End of Year 2016

As a result, the SMPC, THIP, Beauty and Global were included for investment and then they moved to next stage of coefficient of variation analysis to make a list interested companies for investment as shown in Table 8 below.

Table 8: Coefficient of Variation of Listed Companies

Year	2014	2015	2016
SMPC	17.9939	6.8150	18.2306
THIP	-7.9540	-29.3695	4.5270
Beauty	14.2584	6.5238	9.2849
Global	-4.3580	-6.1976	5.8319

Table 8 revealed that during 2014 – 2016 annually CV quite varied among those companies over time, reflecting from the significant changes of CVs both in magnitude and sign. In 2014, all companies faced an unimpressive situation, reflecting from negative CV or high CV. The SMPC and Beauty had quite high positive CVs at 17.9939 and 14.2584 respectively, implying that they had positive returns and also high risks in terms of standard deviation. While, the THIP and Global had negative CVs at -7.9540 and -4.3580 respectively due to negative returns and low risks. For 2015, the SMPC and Beauty were likely to gain better performance, resulting from the reduction of their positive CVs declined; in contrast, the THIP and Global seemed to be in worse situation, revealing from the increase of negative CVs. Fortunately, all companies gained positive CVs in 2016. To gain more useful information, the list of interested company for investment was performed by CV order, started with the THIP (4.5270), followed by Global (5.8319), then Beauty (9.2849) and SMPC (18.2306).

5. Discussion and Conclusions

The purpose of this study was to find out relationship between risks and returns of service sector and manufacturing sector, which are major drivers to Thai GDP. The results show that servicing sector (representing by commerce group) provided higher return and lower risks than industrial sector (Representing by packaging group) during 2014 – 2016. Obviously, listed companies in both sectors provided higher VaRs because of politic problems at that period. Although, Thailand's King Bhumibol Adulyadej has passed away on October 13, 2016, the VaRs of all companies insignificantly changed. To depth insights, the top three high return of listed companies in packaging group were, the SMPC, THIP and TPP; whereas, those of commerce group were Beauty, KAMART and Global. To make a list of interested company for investment, the CV was performed and the list stated that the best choice for investment was the THIP, followed by Global and Beauty.

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