

GNAM Investment Competition 2016

- Samsung SDI -



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Introduction

This report consists of five parts. At the beginning, readers are introduced to the Korean economy following with deep analysis of Samsung SDI; overview of the company, performance analysis including financial statements interpretation and revenue breakdown, reasoning for investment, and finally some potential risks that may occur from investment. Also, discusses about main competitors in the market.

Korean Economy

The economy of South Korea is the fourth largest economy in Asia and eleventh largest in the world. Unique family owned conglomerates called “chaebol” dominate economy of South Korea. Reviewing history, South Korea had a massive rise from one of the poorest countries in the world into a developed and high-income country. GNP per capita has increased from \$87 in 1962 to \$36,612 in 2015.

Nevertheless, it is important to mention that back in 1997 Asia suffered through financial crisis, which in case of South Korea led to adaptation of new policies as well as national development of the Information and Communications Technology. Which led to further technology development and economy growth. Looking further into the economy, it is impossible to overlook one particular chaebol named Samsung group. Samsung alone is responsible for over 20% of the Korean economy. This report focuses mainly on Samsung SDI, one of the subsidiaries of Samsung group.

Company Overview

The origins of the company started in 1970 with the incorporation of Samsung-NEC Inc. At that time, company mainly focused on the mass production of vacuum tubes because it was the first company in Korea to produce them. Next big achievement for the company was the development of the Korea’s first liquid crystal displays in 1986. Following with Korea’s first Plasma Display Panel in 1988.

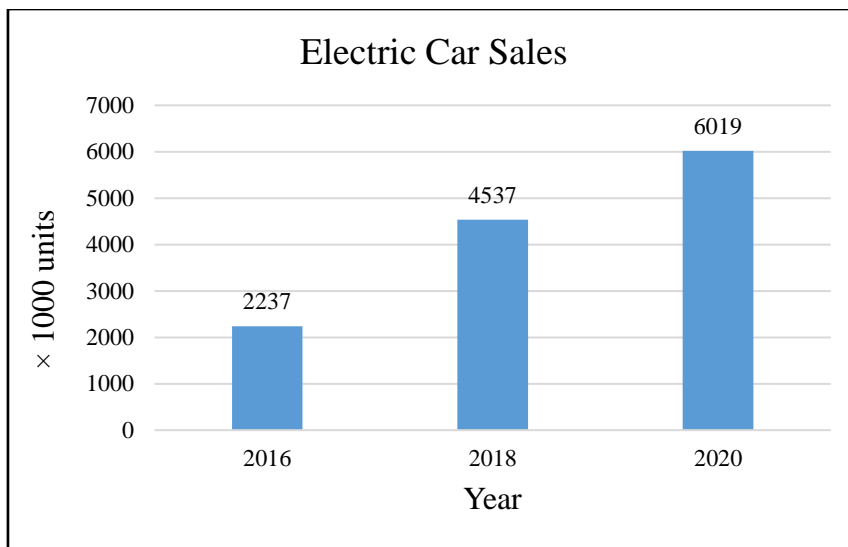
In 2005, company started mass production of the world’s first cylindrical 2600mAh batteries. This led to the acquisition of the largest market share in small-size rechargeable battery market in the world in 2010. In 2014, Samsung SDI merged with Cheil Industries in order to create World-leading Materials and Energy Company.

As of Automotive batteries, in 2015 Samsung acquired Magna Steyr Battery Systems to complete the business system starting with modules going all the way to battery packs. As of 2015, Samsung is 6th in the market, but aims to reach number one position in the global EV market in the future. Samsung SDI also produces Energy Storage Systems with the usage of the lithium-ion. In late 2015, Samsung SDI spun off its chemical division into a separate company and sold it to Lotte Chemical in order concentrate onto battery business.

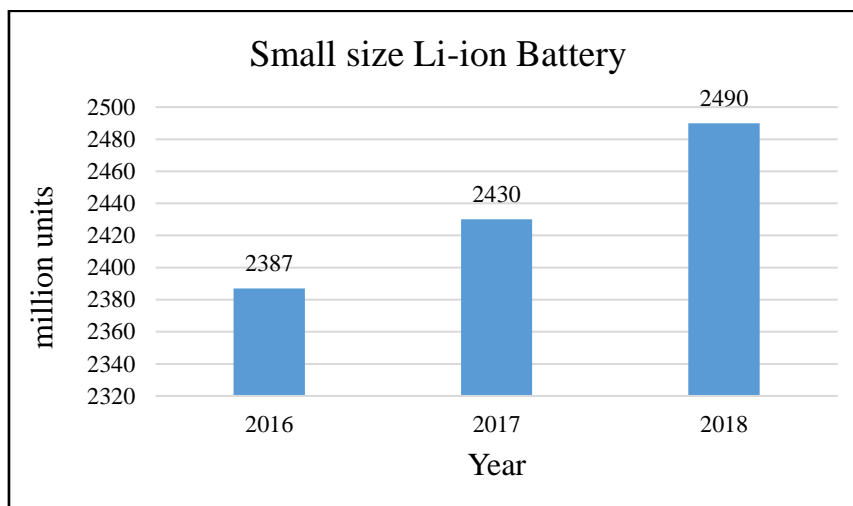
Outlook

1) Market outlook

As mentioned in the previous section, SDI's main business are small-sized Li-ion battery and Electrical vehicle (xEV) battery. Below charts show how those 2 markets will grow over the next few years.



Expected number of Electrical Vehicle ~ xEV Battery sales

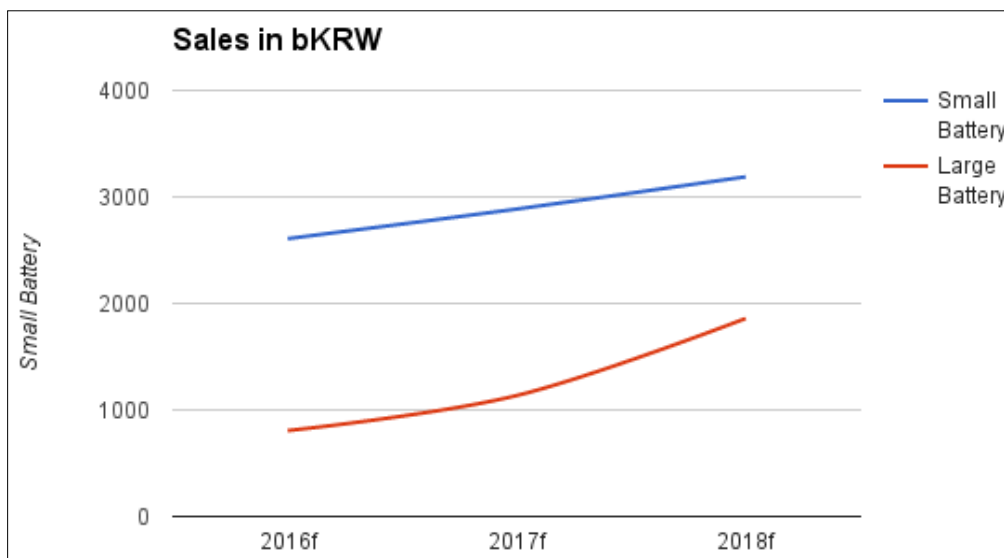


Expected number of Small-sized Li-ion battery sales

In 2016, the demand for Li-ion batteries grew by 8% from last year and reached to sell 5 billion cells. The demand for smartphones and smart-watches is expected to increase by 16% and 57% respectively in the IT field. In the public announcement, Samsung SDI will continue to force their business strategies aggressively to promote new technologies such as flexible batteries and lithium polymer batteries.

2) Company outlook

Samsung SDI is expecting stable growth in smartphones markets. The electronic market for semiconductors seems promising as memory and NAND chips and overall businesses are expected to boom.



Small (Cell phones) & Large(EV) battery sales forecast

(KRW bn) _	2016f	2017f	2018f		After Note7	2016f	2017f	2018f
(Small battery Sales)	2,630	2,901	3,188		(Small battery Sales)	2,608	2,886	3,189
Operation	25	74	118		Operation	-146	73	118
Operation Margin	0.9%	2.5%	3.7%		Operation Margin	-5.6%	2.5%	3.7%
(EV battery sales)	806	1,135	1,859		(EV battery sales)	806	1,135	1,859
Operation	-885	-130	86		Operation	-885	-130	86
Operation Margin	-109%	-11.5%	4.6%		Operation Margin	-109.8%	-11.4%	4.6%

Forecast of Small and Large size battery sales of Samsung SDI

	2nd Q16	1st Q16	
Revenue	1,317.2	1,291	
LIB	874.4	862.9	
Electronic Materials	441.6	426.4	
Operating Profit	-4.10%	-54.50%	(Loss reduced)
Pre-Tax Profit	-3.50%	-67.3%	(Loss reduced)
Discontinued Operations	995.9	86.80%	1047.40 %
Net Profit	955.8	-717.2	Turned Profit

Financial statement of Samsung SDI

Samsung SDI invested 1 trillion KRW in the electric vehicle battery business in April 2016. Because the company plans to focus on the mid and large secondary cell business after they sold chemical business, expectations are it will seek to increase value in this sector. Samsung SDI is pushing to streamline to focus on EV battery business portfolio. Samsung SDI investment is a 40 percent increase compared from last year (682.2 Billion won). They've increased investment in a plan to expand manufacturing facilities overseas. The revenue breakdown analysis shows that they have forecasted the sales to grow by at least 30% and reduce the operational costs by 10%. Now Samsung SDI is the producer of BMW's battery cells. This forecasting might not be accurate but based on public announcements. Nevertheless, it has high implementation potential.

Qualitative Valuation

This section describes how certain event affects the stock price of the company.

During the last few years, Samsung SDI conducted few M&A activities. Also, recent Galaxy Note 7 battery issue reflected onto the stock price in the following way

1) Galaxy Note 7 battery incident



Samsung SDI stock price after Galaxy Note 7 battery incident

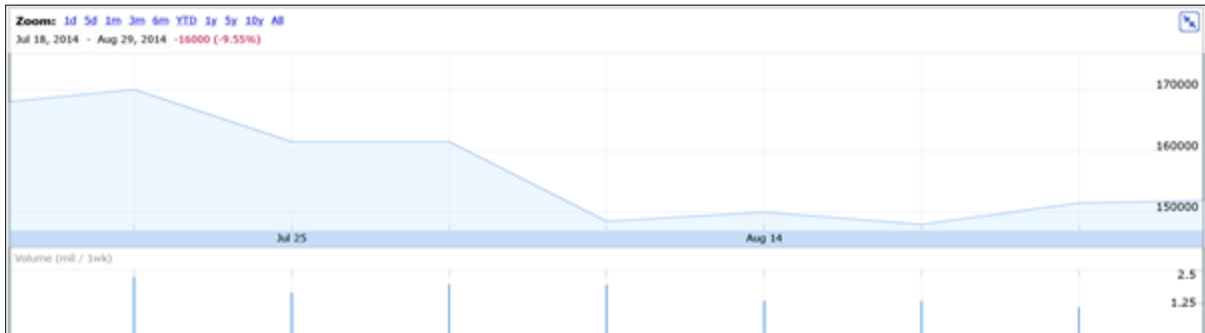
This incident describes how Samsung SDI stock is highly dependent on the Small-Sized battery market. Samsung Electronics announced recall of Galaxy Note 7 due to battery overheating issues and in the end decided to stop its production. This impacted the share price of Samsung SDI as 70% of those batteries were produced by Samsung SDI. The stock price went down by 30% within a month. Initially, Samsung Electronics decided to have Samsung SDI produce 70% of the initial batch and 30% done by Amperex. But after the incident, Samsung Electronics removed Samsung SDI as a supplier and had Amperex produce 100%. However eventually a few batteries produced by Amperex had similar overheating issues resulting in which Samsung Electronics decided to shut down the production of Galaxy Note 7.

The original reason for this issue hasn't yet been fully realized and based on SDI officials, the results of Samsung Electronics internal probe will be out in 4Q16. Based on the information available, we assume the following costs for Samsung SDI. A potential reputational risk cannot be quantified yet.

Total costs = (#units sold × Percentage of SDI production × scrapping price) + other costs (Lawsuits, transportation, fines, etc.)

$$\text{Total costs} = 1.5\text{m} \times 0.7 \times \$150 + 50\text{m} = \text{approx. } \$200\text{m}$$

2) Merger with Cheil Industry in 2014



Samsung SDI stock price post Cheil Industry merger

Samsung SDI Co. Ltd. and Cheil Industries Ltd. announced that their boards of directors approved the merger of the two companies, aimed at creating a world-class provider of materials and energy solutions. The move was to acquire Cheil Industry's technology to produce polarizing film for its batteries. This shows that Samsung SDI wanted to focus more on to battery business.

Samsung SDI issued new shares to be exchanged for existing shares of Cheil Industries at a ratio of one to 0.4425. This new entity is called as Samsung SDI. Post-merger, stock price went down by 8.8%. This follows typical trend of acquiring company's stock price falls due to paying premium for purchases. Also, due to the risk involved in integration of two companies.

3) Selling chemical division to Lotte Group



Samsung SDI stock price after selling Chemical division to Lotte Group

Samsung SDI spun off its chemical division into a separate entity and sold it to Lotte Chemical. The company officially announced on Nov. 13 that it held a shareholder meeting related to the spinoff of its chemical unit into the separate company. The stock price of Samsung SDI went

up by 15% after this announcement. This also follows typical trend since the company buying the shares pays premium to the seller.

Samsung SDI announced that proceeds will be used to focus on batteries for electric vehicles. The company plans to expand production facilities and boost research-and-development resources extensively in xEV battery production.

Quantitative Valuation

To estimate a fair share price of Samsung SDI, a DCF model based on perpetuity growth principle has been created. At the moment, three main items are affecting the SDI business. First the “Note 7” incident, second, selling chemical division and third its shifting focus from small towards large batteries. Nevertheless, we expect a stabilization in business operations by 2017. Our model is based on conservative assumptions listed below.

bn KRW	2015a	2016e	2017f	2018f	2019f	2020f
Revenue	7,569.00	5,214.00	5,996.10	6,895.52	7,585.07	8,343.57
YoY change	38.27%	-31.11%	15.00%	15.00%	10.00%	10.00%
Operational Profit	-60.00	-786.00	196.10	805.51	1,190.57	1,629.35
YoY change	-185.71%	-1210.00%	124.95%	310.77%	47.80%	36.85%
Free Cash flow	-567.00	-1,784.28	-333.72	99.97	517.51	855.19
YoY change	29.83%	-214.69%	81.30%	129.96%	417.67%	65.25%

Expected revenue, operating profit and free cash flows of Samsung SDI

Few of the relevant assumptions/calculations involved in DCF analysis		
Assumption/Calculation	Value	Reason
Rf (Risk free rate)	2.3%	Based on US treasury bills, long term bond rate of both US and Korea
Rm (Market rate of return)	9.8%	Conservative assumption against the ongoing rate of return as high as 14%
β (Beta) – Company share price in comparison with the market	0.82	Assumption based on data from various financial stock market analysis
Re (Cost of Equity)	8.45%	$Re = Rf + \beta(Rm - Rf)$
Rd (Cost of Debt)	1.25%	Percentage of Interest paid from Total Debt in 2015
Corporate Tax rate (t)	33%	Taxes paid divided by the Income before taxes

WACC (Weighted Average cost of Equity)	6.12%	$WACC = (Re \times E/V) + (Rd \times (1-t) \times D/V)$
Long term cash flow rate	2%	Conservative assumption based on Korean GDP growth percentage of 2.61% and increment in the value of relatively high number of assets of Samsung SDI and high growth in demand of battery manufacturing due to global pollution cutting measures.

Considering a WACC of 6.1% and long-term growth rate of 2% a perpetuity growth model provides a target share price of 151,119 KRW. This is an upward potential of 62.5%.

The following tables provide results for multiple WACC and growth rate scenarios.

		Perpetuity growth rate		
Price per Share(KRW)	151119.5	1.5%	2.00%	2.50%
WACC	4.00%	338327.2	444690.2	621961.8
	5.00%	205401.5	254148.5	322394.2
	6.12%	125346.4	151119.5	184012.1
	7.00%	85619.82	102879.2	123974.1

What if analysis of estimated share price(KRW)

		Perpetuity growth rate		
Upside share price	62.49%	1.5%	2.00%	2.50%
WACC	4.00%	263.79%	378.16%	568.78%
	5.00%	120.86%	173.28%	246.66%
	6.12%	34.78%	62.49%	97.86%
	7.00%	-7.94%	10.62%	33.31%

What if analysis of change in share price (%)

The above analysis show that there is a high probability of increase in share price by at least 10% (neglecting the low probability of high WACC and low perpetuity growth rate). The analysis also shows that the estimated values of WACC and perpetuity growth rate provide a reasonable estimate of practicability.

Risks

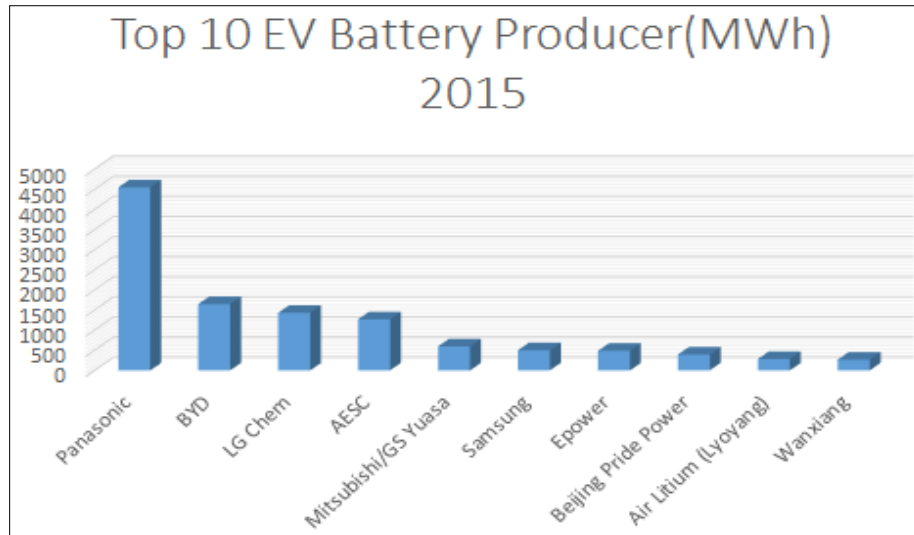
Four items are identified as potential risks for Samsung SDI's future stock price. First, due to the recent battery quality issue, Samsung electronics might be reluctant to select SDI as a battery supplier for next Galaxy model. Selecting SDI can potentially upset the customers, giving them the idea that SDI is being selected just because SDI is part of Samsung group, rather than a supplier who could produce quality products.

Second, scrapping cost of defective battery will impact the SDI's revenue and eventually reflected on to stock price. Third, one of the major business of SDI is electrical car batteries. If the oil price is kept low for longer period of time, electrical vehicle market could slow down and hurt SDI's car battery business. Fourth, strong Korean Won appreciation could impact SDI's profit. This is typical for all non-US companies.

Competition

- 1) **Panasonic:** Recent announcement of Elon Musk's Tesla coordination with Panasonic is likely going to increase the xEV market share of Panasonic mainly driven by technological competitiveness and strong growth of Tesla cars market sales. The new investment of Panasonic in establishing new factories to boost up the production of xEV will likely gain more traction in the future. Please do note that Panasonic has officially started working with Tesla in its ambitious Giga factory project as well as Solar city subsidiary. Tesla has now emerged as the largest market share holder of electrical vehicle sales and orders. This exponential growth characteristics of Tesla could positively increase the sales and revenues of Panasonic batteries.
- 2) **Amperex (TDK):** Founded in 1999 and headquartered in Hong Kong. It is one of the top 5 global lithium-ion battery suppliers which makes it a direct competitor to Samsung SDI. Samsung electronics chose two suppliers to provide batteries for Galaxy note 7. Two suppliers were Samsung SDI and Amperex. Also it is the Apple's main supplier for iPhone batteries. Samsung has used Amperex for 30 percent of its initial batch of Note 7s but after the incident it has been identified as sole supplier for its batteries.
- 3) **LG Chemical:** LG CHEM, LTD. is a Korea-based company principally engaged in the manufacture of petrochemicals. The Company mainly operates in three business divisions: petrochemical division, which manufactures polyvinyl chloride (PVC) resins, low-density polyethylene (LDPE), poly styrene (PS), acrylonitrile butadiene styrene (ABS), bisphenol A, acrylate and other chemicals; information and electronic material division, which manufactures toner, photosensitive materials, organic light-emitting diode (OLED) materials, circuit materials and others used as display materials, and battery division, which manufactures rechargeable batteries applied in mobile phones, laptop computers and other mobile devices, as well as lithium-ion batteries used for automobiles. LG chemical mainly competes with SDI in the EV section of the industry. LG chemical will be providing EV batteries to Tesla's competitor, Faraday Future.

Given below is a graph which indicates the top 10 EV battery producers right now in the market. Panasonic gains the top spot due to its association with Tesla and Samsung SDI stands at 6th position with its present tie ups with BMW, Volkswagen and Chrysler automobiles.



Top 10 EV Battery producers in 2015

Conclusion

Based on our qualitative and quantitative (DCF analysis based on perpetuity growth model) analysis, we are convinced Samsung SDI is undervalued at this moment. We expect a target price of 151,119 KRW. This is an upside of 64% from the current share price of 93,000KRW.

The widely known Note 7 incident creates significant uncertainty, which is not reflected in the company fundamentals. Instead, we see a clear focus on large battery market, which promises strong growth over the next 5 years. Based on our research on both cell phone and electrical vehicle battery market, we only expect both market to grow and this will directly reflect into SDI's future revenues.

Investment Idea Summaries

AVISTA (090370)

Avista is a manufacturer and retail distributor of clothing, accessories, and jewelry. It has high exposure in the Chinese and Korean markets. The company, holds three brands which are: BNX (responsible for 50.94% of Avista's profit), KAI-AAKMANN (responsible for 30.76% of Avista's profit), TANKUS (responsible for 15.94% of Avista's profit), and eryl, B 2.33% profit. The company itself has 288 Billion won in revenue and total assets of 1,033 Billion won.

The financials disclosed on March 2016 show that net profit has increased 24% from 2012. On the other-hand, earnings showed a negative growth with a decrease in EBITA by 5.2%, decrease in operational margins by 9%, and an increase in Debt by 572.6%.

We estimate Avista will increase revenues by at least two times more than what it currently has. This estimate is mainly based on a public announcement by JYP (an entertainment company), which publicly announced that it plans to work with Avista in its attempt to expand within the Chinese market. Since it only targets the female market and the young casual market, it has a high chance of success in China because of the high percentage of female population.

Based on an analysis of the company's financial statement and stock price, Avista is currently at its bottom line. Currently, they are at valued at 1,230 won per share. Our target price is 1,800 won per share; thus, we believe that the stock is underpriced and it has a lot of potential to increase. Therefore, we recommend a BUY for Avista.

Division	K-IFRS					
	2012.12	2013.12	2014.12	2015.12	2015.03	2016.03
Revenue	1,363	1,414	1,279	1,160	309	288
Operation Profit	27	32	22	-245	-9	-26
EBITDA	105	91	71	-192	2	-15
Total Asset	1,554	1,413	1,448	1,140	1,313	1,033
Net Profit	366	338	379	451	391	454
Operation margin %	2%	2.3%	1.7%	-21.2%	-3%	-9%
EBITA %	7.7%	6.4%	5.5%	-16.6%	0.6%	-5.2%
EBITDA (Interest Expense)	2.5	2.6	2.2	0	0	0
Debt ratio %	172.3%	167.3%	163.7%	481.3%	148.1%	572.6%

Hanmi Pharm (128940)



Description

Hanmi Pharm. Co., Ltd. is a Korea-based company mainly engaged in the manufacture of pharmaceuticals. The Company provides prescription drugs, including antidepressants, painkillers, injections and others. It also provides over-the-counter (OTC) drugs and medicine raw materials. The Company distributes its products within domestic market and to overseas markets.

Overview

Company annual sales grew from 761.3 to 1317.5 billion KRW in 2014 to 2015, which is an increase of 73%. 2016 1st Q sales were 256.4 billion KRW which is 19.4% YOY growth. Operating profit also grew by 976% from 2.1 billion KRW to 22.6 billion KRW YOY.

Recent Developments

Firm is under suspicions for leaked confidential data before an official regulatory filing, allowing some investors to reap gains from massive short selling leading to detriment of retail investors. The company announced on 9/30/16 that its licensing deal with Boehringer Ingelheim on a lung cancer compound, olmutinib, was terminated. The announcement came just 30 minutes after the stock market opened, and Hanmi shares were trading firmer because of a separate anticancer drug deal which the company announced a day earlier. Returning a license is an occasion that can be observed quite frequently in the process of new drug development, however, the timing of Hanmi's posting is suspicious and might be resolved soon.

Investment suggestion

The company has capability to develop new drugs and its growth fundamentals are still solid. The stock price is temporarily down due to the investigation but eventually it is expected to go back.

SK Hynix Inc. (000660)



Since 2012, South Korea has become the second largest semiconductor producer in the world with a market share of 13%. Market share is divided mainly between two of the biggest semiconductor producers namely Samsung Electronics and SK Hynix.

World market share of SK Hynix, has increased from ~ 3 % in 2006, to ~ 4.5 % in 2014. SK Hynix focuses primarily on DRAM and NAND memory production and is the second biggest memory chip supplier in the world. In addition, SK Hynix plans to invest \$ 39 bln in 2015 on semiconductor manufacturing plants and \$10 bln in expanding its Chinese production plants

Based on the statistics, in 2015 demand for semiconductors and related products such as DRAM and NAND has increased roughly by 25 %. However, because of the increasing difficulty in reducing the price of semiconductors by producers, supply of semiconductors increased only by 15 %. Thus, due to limited amount of supply, the price of semiconductors increased and the price of SK Hynix Stocks has increased by ~ 22 % alone last year. Thus, with current increase in demand for semiconductors, SK Hynix benefits continuously.

Furthermore, based on this year's demand, SK Hynix is expected to rise by ~15 % based on reasons such as already low chip inventory with the suppliers and at the same time growing demand for new smartphone models, leading to an increase of seller power and buyer competition.

Hanmi Science Co., Ltd. (128940)

Description

Hanmi Science Co., Ltd. is a Korea-based holding company. Through its subsidiaries in Japan, Europe and South Korea, the Company operates its business through two segments: pharmaceutical products wholesale segment, which mainly engages in distributing pharmaceutical medicines, and another segment, which engages in producing medicines and providing food services.

Overview

The Company's sales grew from 220.4 (2013) to 532.9 billion KRW (2014) which was a growth of 142%. From 2014 to 2015, the sales grew 46% resulting in 776.6 billion KRW sales revenue. Until 2014, the yearly net profit for the company was below 10 billion KRW. It has abnormally grown to 147 billion KRW (1,482% growth) from 2014 to 2015. Cash doubled within 3 years, and debt started dropping since 2014. Company started paying out the dividends in the year of 2015.

Recent Development

Recently, Hanmi Pharmaceutical (its main subsidiary in Korea) faced investigations for illegal activities. The incident was recently publicized, and the investigation still continues (as of Oct. 30th, 2016). June of 2016, Hanmi science Co., Ltd. became the largest shareholder of JVM, the biggest worldwide company for automated medication dispensing machines.

Investment Suggetion

Hanmi science Co., Ltd. has 7 subsidiary companies and 2 affiliated companies including Hanmi Pharm. Co., Ltd. Hanmi science Co., Ltd. is a remarkably great company; all its subsidiaries are growing fast. Although recent investigation over Hanmi Pharm had a direct influence on its mother company, many believe that the stock price would rise back up to normal in the next 6 months.