LEADING

Mid-Cap Research

Green Cross (006280 KS)

January 9, 2012

Tarzan – The leader of the Bio Jungle

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Leading Traffic Light: Green

Green Cross is…

- ✓ The leading producer of vaccines and blood-driven products that are not affected by price reduction policy by Ministry of Health & Welfare
- ✓ In possession of broad development pipelines

Green light because:

- ✓ Strong fundamental owing to biomedicines such as vaccines and blood-driven products
- ✓ Value creation through the release of new products with proven proprietary technology

Growth Potential:

- ➢ Development of new vaccines and blood-driven products
- ➢ Increasing proportion of high value added flagship products such as antibody and protein drug
- ➢ Price reduction policy by MHW has little influence given little exposure to generic drugs

Management & shareholder concern:

- ➢ Management philosophy directs to aggressive investment in R&D for future growth
- ➢ Transparent management adding value to the company

Strong Value Creation:

- ➢ Developing six primary projects to enter niche markets in the US and other developed countries
- ➢ Focusing on new biologics and bio-better and staying away from biosimilar market that has become a red-ocean

Valuation:

- ➢ 50% PER premium to the pharma/bio market is warranted given stability and growth potential
- ➢ Target price of W225,000 per share implies 50% share price appreciation potential

CAVEAT EMPTOR!!! – Watch out for…

- ➢ Failure of clinical trials in the U.S could cause a loss

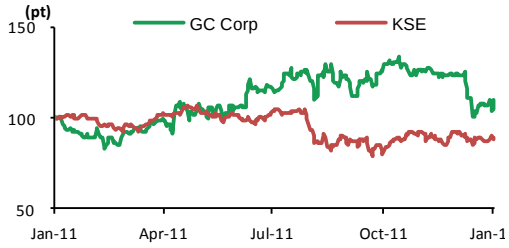
BUY

Target Price (KRW)	**W225,000**
Current Price (KRW)	**W150,000**
Upside potential	**50.0%**

Key Data	**Jan 6, 2012**
Sector	Pharma&Bio
Kospi	1,843.14
Market Cap. (Wbn)	1,519.6
Share Outstanding (m)	10.1
Foreign Ownership (%)	28.2%
52 Week High (W)	182,500
52 Week Low (W)	144,000
60-d avg.turnover (Wbn)	4.6
Major Shareholders	**(%)**
Green Cross Holdings	50.04
National pension fund	8.32

Performance (%)		**6M**	**12M**
Absolute	(11.2)	(3.8)	9.9
Relative	(7.3)	11.6	21.2

Relative Performance



Valuation Forecast

FY	Sales (Wbn)	% chg yoy	OP (Wbn)	OPM (%)	NP (Wbn)	EPS (W)	EPS Growth (%)	PER (x)	EV/EBITDA (x)	ROE (%)	P/B (x)
2008	516.1	16.7	67.9	13.2	48.9	5,423	10.2	27.7	17.3	19.4	5.1
2009	643.2	24.6	119.4	18.6	80.5	8,936	64.8	16.8	9.9	25.7	3.8
2010	791.0	23.0	145.6	18.4	104.7	10,683	19.6	14.0	8.9	23.2	2.6
2011E	770.2	(2.6)	97.8	12.7	71.5	7,293	(31.7)	20.6	12.5	12.6	2.5
2012F	854.2	10.9	116.2	13.6	84.9	8,669	18.9	17.3	10.9	13.5	2.2
2013F	948.6	11.1	138.5	14.6	101.4	10,349	19.4	14.5	9.3	14.4	2.0

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Key check points

✓ Green Cross appears robust as it evades price reduction policy

A large-scale generic drugs price reduction policy was announced by Ministry of Health and Welfare (MHW) on August 12th, 2011 had a huge impact on the pharmaceutical industry. As a result, majority of the industry is expected to suffer from decreased revenue and operating income and will be forced to restructure. However, Green Cross is expected to be largely unaffected by the policy as its core product line consists of non-generic drugs such as vaccines and blood derivatives (75% of total revenue). Given that revenue from generic drugs is only 12.5% of total revenue, the impact on Green Cross is minimal. 2011 was a remarkable year for Green Cross, as it was able to establish a solid foundation for future growth. Its seasonal flu vaccine passed the pre-qualification stage (PQ) of the World Health Organization (WHO), enabling the company to generate sales in the South American market. Furthermore, the company acquired an additional blood drawing center in the US in 2011. With three blood centers in total, the company has access to 120,000 liters of blood for use in blood-driven product. Also, a plan to export a blood-driven product manufacturing plant to Thailand was completed. Further growth is expected given that the company has a strong product line for vaccines and blood products. 12 different products in the development pipeline will function as a growth engine for the company (Page 11-12).

✓ Specializing in developing biomedicine and biobetter

Although the risk related to the development of biosimilars is relatively low, Green Cross is avoiding the biosimilar market due to the low entry barrier and intense competition. Instead, the company is concentrating on developing new biologics and biobetters (antibodies and protein medicines), which guarantee profit after a rather complicated development process. The company is planning to add biobetters and new biologics to its flagship products along with vaccines and blood products. Therefore, over 20% of total R&D expense will be invested in biomedicines and biobetters. Currently, the company has seven related projects in its pipeline which include a cure for Hunter's syndrome (GC 1111) which is expected to be released in Korea in 2012 with completion of clinical trials in Korea (Page 18-22).

✓ Increasing export to advanced countries and carving out niche markets

Green Cross is planning to increase export to the US and other developed countries. The company's vaccine and blood-driven products have already been recognized internationally. The export to developed markets is expected reduce costs as they require only one round of clinical trial for some of these products instead of three. The company is also developing protein drugs as means to enter the relatively small specialty pharmacy market, from which major global pharmaceutical firms tend to shy away. Although it is true that patient population for rare diseases is small, drug costs for these are relatively high. The company expects to generate $1bn in revenue from six different specialty pharmacy projects by 2018F (Page 21).

✓ Consistent investment for future growth

Green Cross is preparing a large scale investment in R&D in the amount of W130.0bn during 2011~2012, of which W54.0bn will be invested in new research facilities, and W65.0 will be invested in renovation of existing facilities to meet US FDA regulation. Also, W15.0bn will be invested to complete the phase 3 clinical trials in the United States. Large scale investment is necessary for the company to focus on the development of special medicines rather than sales of generics. Investment is vital to the company's success as it is preparing to start business activities in developed countries, which make up 80% of the revenue generated in the pharmacy/bio industry (Page19-20).

✓ Target price of W225,000 per share implies upside potential of 50%

Many Korean pharmaceutical firms generate profits by simply importing and distributing drugs. Also, some biotechnology firms are not even capable of generating profit. Therefore, considering Green Cross' sound balance sheet and strong growth potential, we believe Green Cross deserves a 50% premium to the domestic pharma/bio sector year high PER of 17.9X (2012F) which renders a fair PER of 26.0X. Applying the 26.0x PER to 2012F EPS of W8,669, we derive at a fair share price of W225,000.

Section 1: Company Snapshot

Preparing for a quantum leap into international market

Creating value through technology transfer

Established in 1967, Green Cross has been a pioneer for developing vaccines and blood-driven products in Korea. The company was first in Korea to develop the vaccine for Hepatitis B in 1983 (third globally). In 1988, it was the first in the world to develop the vaccine for epidemic hemorrhagic fever. Additionally, the company became a leading vaccine developer by releasing the swine flu vaccine after only six months of development. Recently, the company's seasonal flu vaccine was approved by the WHO, meaning it should soon be ready for export. With strong recognition for blood products, the company was able to export a plant for plasma based products, earning $61.6mn.

Selected biomedicines and biobetters for a new growth engine

Green Cross is in the process of developing antibody/protein drugs, which will be the company's major future growth engine. The biomedical market can be classified into three different categories based on original innovation: new biologics, biobetters, and biosimilars. Green Cross is focusing on new biologics and biobetters but is avoiding the biosimilar market because it has limited growth potential. To this end, the company is planning to enter the specialty pharmacy market, which is too small for it to see much competition from global pharmaceutical firms.

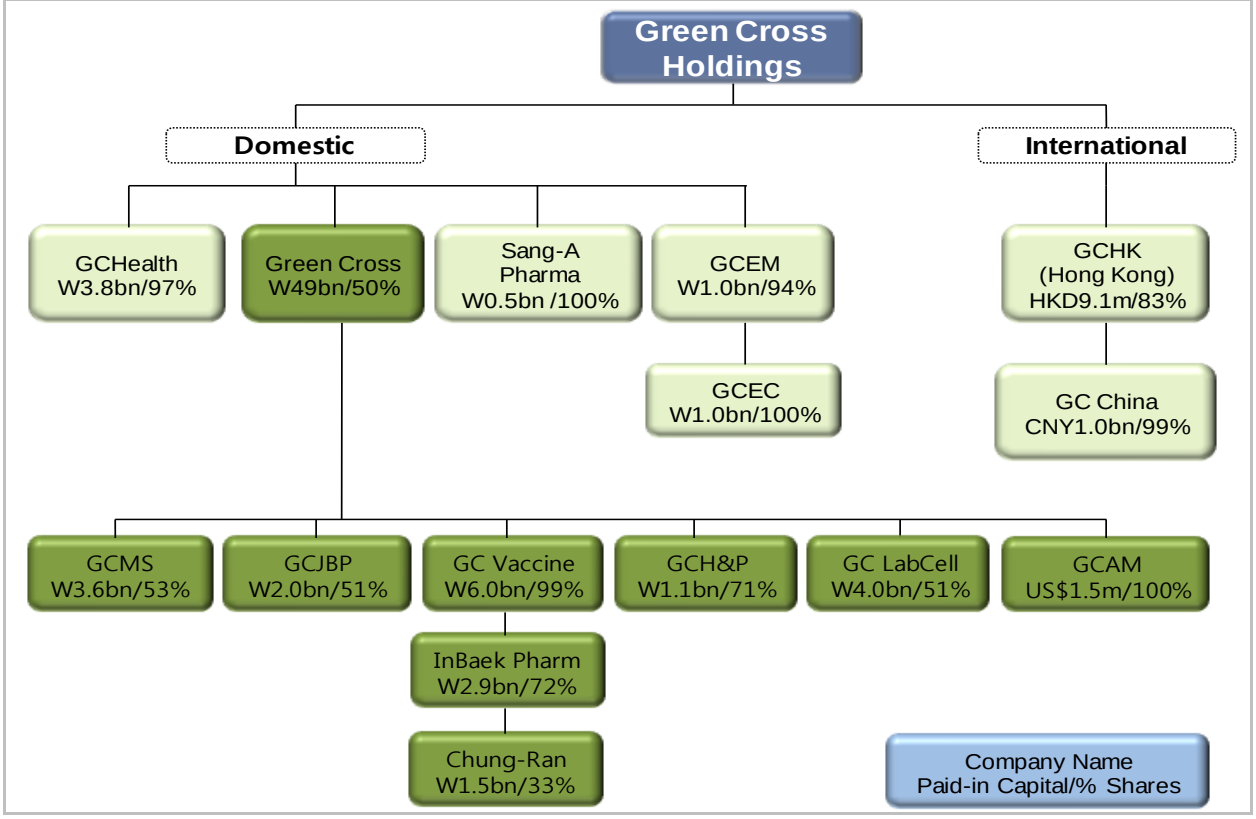
Possessing a strong pipeline to make an entry into advanced markets

The company's strong pipeline consists of three primary product areas. Three vaccine related projects, five blood-driven products related projects, seven antibody/protein drugs related projects, and four other projects are under development. Among these, Green Cross has selected six special projects, which will be steppingstones for the company to enter the global market. As products launch, each product is expected to generate at least W100.0bn~300.0bn of annual revenue. Additionally, collaborating with Macrogenics, the company is in the process of developing the biobetter of Herceptin (cancer drug), MGAH 22.

Consistent revenue increase expected except 2011

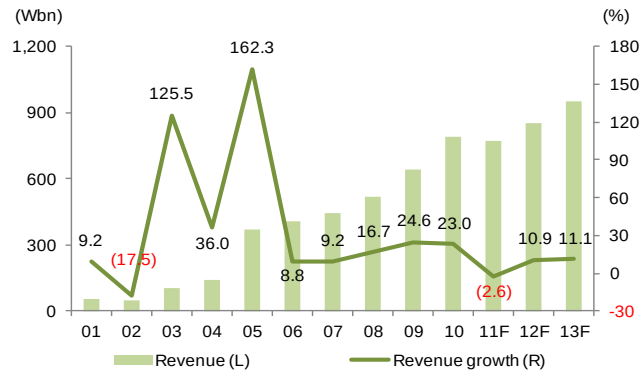
2011E revenue is expected to decline by 2.6% resulting in W770.0bn because the profit from Swine Flu vaccines has declined after the 2009~2010 pandemic disappeared. However, fueled by the new product launch owing to continuous R&D investment and increased export, the revenue is expected to increase by double figures (11%) starting 2012. In long term perspective, the company has set a goal to generate W2.0trn revenue, W1.0 trn each from domestic and international markets by 2018.

Exhibit 1. Business structure of Green Cross



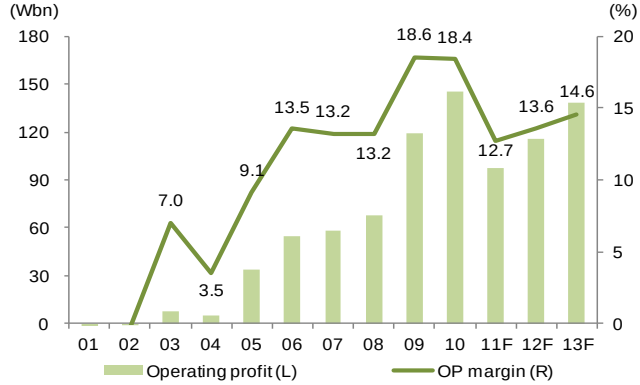
Source: Company data, Leading Research Center

Exhibit 2. Revenue and growth trend



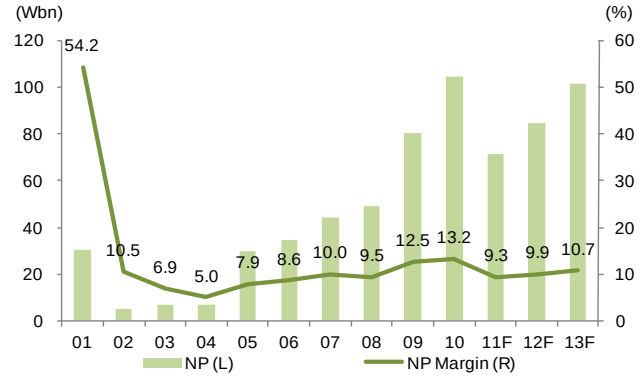
Source: Company data, Leading Research Center

Exhibit 3. Operating profit and OPM trend



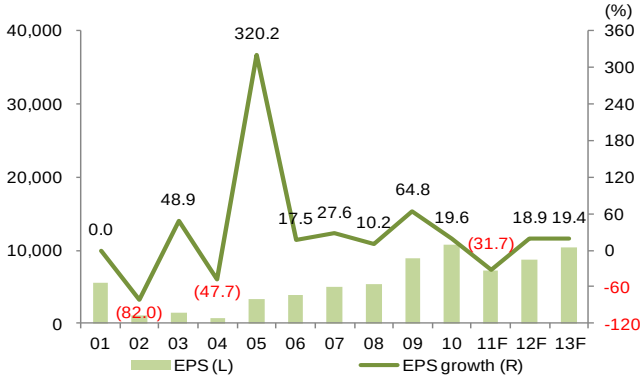
Source: Company data, Leading Research Center

Exhibit 4. Net profit and NP margin trend



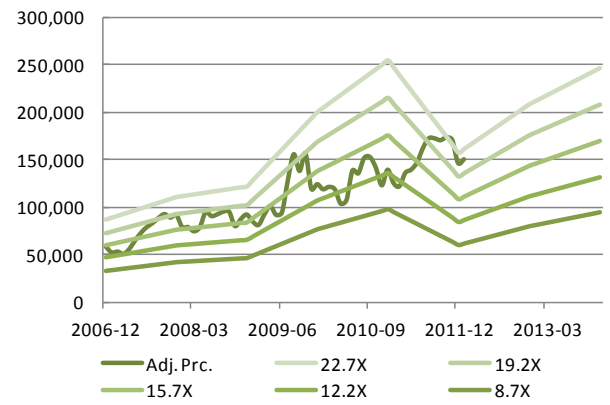
Source: Company data, Leading Research Center

Exhibit 5. EPS and EPS growth



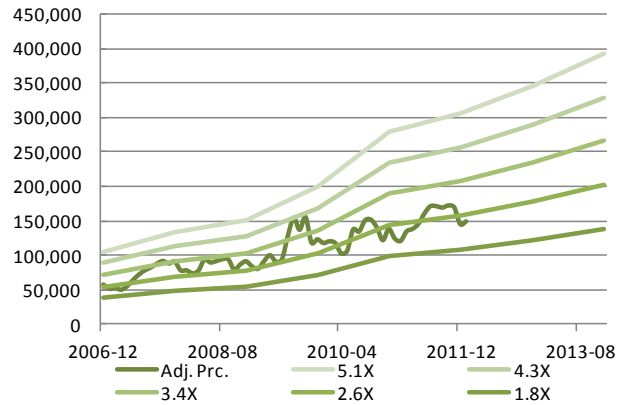
Source: Company data, Leading Research Center

Exhibit 6. PER Band



Source: FnGuide

Exhibit 7. PBR Band



Source: FnGuide

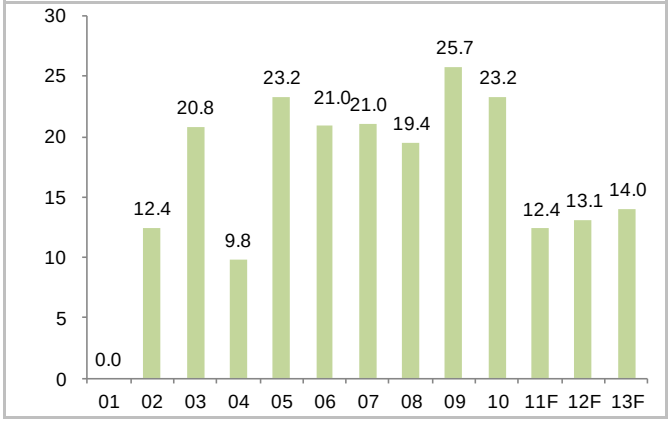
Section 2: Is the company a value creator

ROE improvement starting 2011

Consistent investment in R&D for future growth

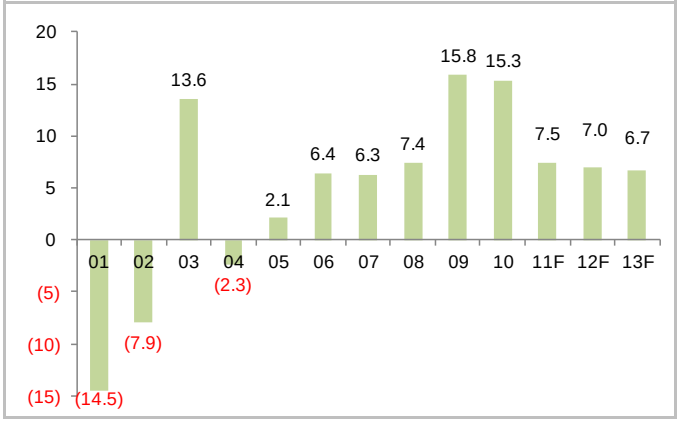
The company had maintained its ROE at the 20% level from 2005 to 2010, and as the revenue from the swine flu vaccine skyrocketed, the ROE surged up to 25.7% in 2009. However, as swine flu vaccine revenue decelerated and investment for future growth was increased, the 2011E ROE is expected to decrease to 12.4%. A high amount of R&D expense will be continued for future growth, resulting in approximately 14% ROE in 2013F.

Exhibit 8. ROE (%)



Source: Company data, Leading Research Center

Exhibit 9. ROIC less WACC (%)



Source: Company data, Leading Research Center

Temporary decrease in ROIC due to R&D expense

R&D is a vital element for pharmaceutical/bio industry

The company was mass producing swine flu vaccine in 2009 and 2010, so the COGS accounted for 58.1% and 60.2% of the corresponding years' revenues. Given that the company is not generating as much profit, the COGS will account for 65.1% of 2011E total revenue. For the same reason, 2011E OPM will drop to 12.7% from 18.6% and 18.4% in 2009 and 2010, respectively. (Exhibit 3)

The company has planned a large scale R&D investment for future growth starting 2011. W54.0bn will be invested to build new research facilities, and W65bn will be invested to improve manufacturing facilities to meet the US FDA's regulation. Lastly, W15.0bn will be used for clinical trial related expenses. This should not be taken as a bad sign, as it is the nature of the pharmaceutical industry that focuses on developing new medicines. Therefore, 2011E ROIC of 7.5 (decreased from 15.3 in 2010) is just a temporary decrease.

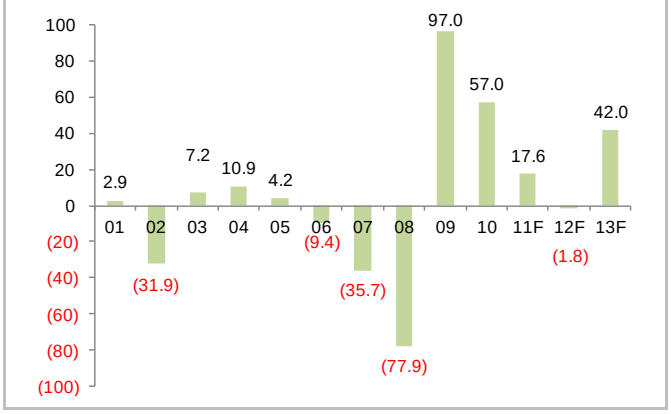
Section 3: Free cash flow generation and dividend policy

Healthy FCF generation despite of high R&D expense

Stable cashflow since 2010

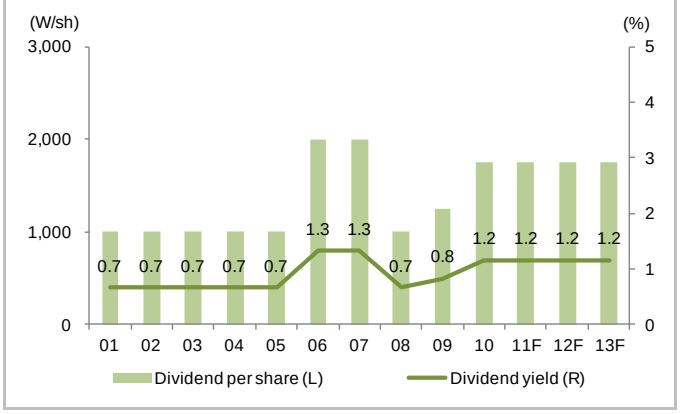
Thanks to high revenue from swine flu vaccines, the company was able to generate free cashflow of W97bn and W57bn in 2009 and 2010, respectively. However, high R&D investment in 2011 and 2012 will cause free cashflow to drop to minus W1.8bn. Once the company starts launching new products, it is expected to generate free cashflow of W42.0bn starting in 2013F.

Exhibit 10. Free cash flow trend (Wbn)



Source: Company data, Leading Research Center

Exhibit 11. Dividend per share and yield trend



Source: Company data, Leading Research Center

Green Cross is planning to make dividend payments of W17bn annually.

Exhibit 12. Dividend trend

(Wbn)	01	02	03	04	05	06	07	08	09	10	11E	12F	13F
Cash from operation	3.2	(30.4)	7.2	16.6	23.7	27.3	35.2	(20.7)	112.1	84.2	62.6	67.7	86.3
CAPEX	0.3	1.5	0.0	5.7	19.5	36.7	70.9	57.2	15.1	27.2	45.0	69.5	44.3
Free cash flow	2.9	(31.9)	7.2	10.9	4.2	(9.4)	(35.7)	(77.9)	97.0	57.0	17.6	(1.8)	42.0
Dividend paid	0.0	0.0	0.0	0.0	0.0	4.3	6.6	8.8	8.8	11.2	17.1	17.1	17.1
Dividend per share (W/sh)	1,000	1,000	1,000	1,000	1,000	2,000	2,000	1,000	1,250	1,750	1,750	1,750	1,750
Dividend yield (%)	1.8	2.0	2.4	1.2	0.7	0.7	0.4	0.2	0.2	0.2	0.1	0.1	0.1

Source: Company data, Leading Research Center

Section 4: Are the debt and interest burden manageable?

Maintaining a net cash position

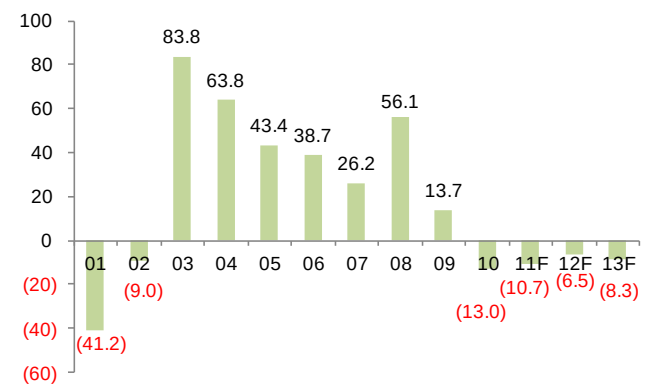
Maintaining an outstanding Net debt/equity ratio despite of R&D investment

The company has used all of its free cashflow from 2010 (W57bn) for debt repayment. As a result, the firm's debt has decreased from W125.2bn in 2009 to W66.0bn in 2010. However, the company will borrow W9.9bn in 2011 and W12.3bn in 2012F for its R&D investment.

In 2011, the company is expected to generate free cashflow of W17.4bn, which the management is planning on paying for dividend. As a result, there will be no reduction in debt in 2011.

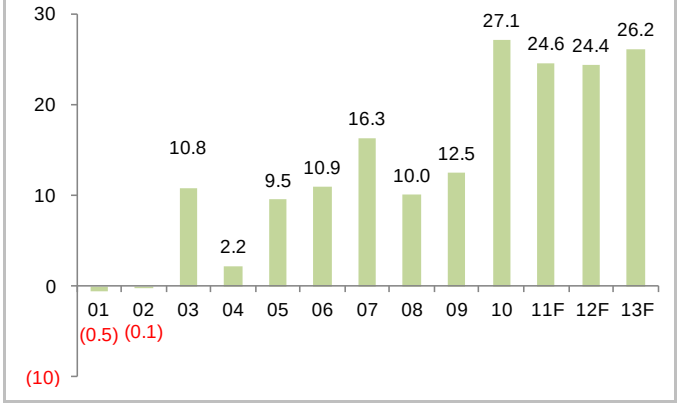
In 2012, the company is expected to spend W22.5bn in cash for R&D investment and dividend payment. Alll in all, the ending cash and equivalents in 2012F is expected to be W132.5bn, which exceeds interest bearing debt of W88.2bn. The net cash to equity ratio will decline from 10.7% to 6.5%.

Exhibit 13. Net debt/equity ratio (%)



Source: Company data, Leading Research Center

Exhibit 14. Interest coverage (X)



Source: Company data, Leading Research Center

Exhibit 15. Interest bearing debt and interest coverage trend

(Wbn)	01	02	03	04	05	06	07	08	09	10	11F	12F	13F
Interest bearing debt	31.8	27.4	35.4	88.3	79.2	87.0	74.4	175.8	125.2	66.0	75.9	88.2	88.2
Cash & equivalents	50.0	30.5	5.6	18.7	16.0	14.9	12.6	26.0	76.0	136.3	141.5	132.5	151.8
Net int bearing debt	(18.2)	(3.1)	29.7	69.5	63.2	72.1	61.9	149.8	49.2	(70.2)	(65.6)	(44.3)	(63.6)
Net int bear debt/eq (%)	(41.2)	(9.0)	83.8	63.8	43.4	38.7	26.2	56.1	13.7	(13.0)	(10.7)	(6.5)	(8.3)
Interest expenses	9.9	5.5	1.2	0.7	2.2	3.6	5.0	3.6	6.8	9.6	5.4	4.0	4.8
Interest coverage (X)	(0.5)	(0.1)	10.8	2.2	9.5	10.9	16.3	10.0	12.5	27.1	24.6	24.4	26.2

Source: Company data, Leading Research Center

Section 5: Asking for money with share issues, CB&BW?

Past strong FCF – no additional stock issue necessary

Raised W84.3bn through stock issuance

The company raised W84.3bn through stock issuance in 2010 and has the majority of it in cash and equivalents. Total of W158.8bn is expected to be invested starting 2011 for the company's capital expenditure. (W45.0bn in 2011, W69.5bn in 2012, and W44.3bn in 2013).

Once the CAPEX investment is completed and subsequently generates profit, there will be no large scale CAPEX in the near future. Furthermore, additional investment will be covered by free cashflow from operation. Therefore, shareholders will not need to be concerned with additional stock issuance.

Exhibit 16. Capital raised through stock issuance

(Wbn)	01	02	03	04	05	06	07	08	09	10	Increase during '01-10
Paid-in capital	27.3	24.1	24.1	45.1	45.1	45.1	45.1	45.1	45.1	49.0	21.7
Paid-in cap in excess of par	16.6	16.6	0.0	0.0	0.0	0.0	70.5	70.5	70.5	150.9	147.6
Capital raised through stock issue		(3.2)	(16.6)	21.0	0.0	0.0	70.5	0.0	0.0	84.3	169.3

Source: Company data

No overhang issue

The company has raised W30bn by issuing the 39th non-secured CBs to expand capacity for the swine flu vaccine plant. However, because all issued CBs have already been exercised in 4Q11, there are no more overhang issues.

Exhibit 17. Outstanding CB and BW and number of shares exercisable

Type	Date issued	Due date	Face Value (Wbn)	Exercise period	Exercise price/sh	Remaining Value (Wbn)	No. shares exercisable
The 39th CB (non-secured)	2009.10.20	2012.10.20	30.0	2010.10.20~2012.10.06	120,655	18.5	153,329

Source: Company data

Section 6: What is the management philosophy?

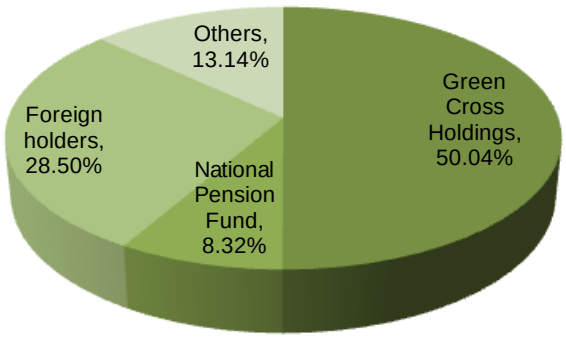
CEO's management philosophy

CEO philosophy suitable for a pharmaceutical firm pursuing future growth

Il-Sup Huh, CEO of Green Cross since 2009, hopes to facilitate entry into the developed countries' market as means of overcoming domestic issues such as mandatory price cut on generic drugs... In order to enter the global market, the company has established a subsidiary, GCAM (Green Cross America), in the US, and also has a plan to enter the Chinese market by listing Green Cross' Chinese branch.

The company's management is striving to achieve future growth through the development of new drugs rather than focusing on generics. As such, continuous investment in R&D, talent, and production facilities is expected.

Exhibit 18. Shareholders



Source: Company data, Leading Research Center

Exhibit 19. CEO profile

CEO Huh Il Sup

Period	Career & Education
2009~	Green Cross Chairman
2002~2009	Green Cross Vice-Chairman
1997~2002	Green Cross President
1991~1997	Green Cross Vice President, Executive Director
1988~1990	Hanil Cement Co. Ltd Director, Managing Director
1988	University of Houston Ph.D (Business Admin.)
1982	Indiana University M.A (Business Admin.)
1977	Graduated from Seoul University

Source: Company data

World class research experts

Globally competent development experts

Byung-Geon Rhee, Ph.D. is the president of Green Cross who is in charge of overall production and R&D. He was awarded the grand prize of 2011 new drug development from Korean Association of Pharmacy for launching Shinbaro Capsule and Greengene F.

Eun-chul Huh,Ph.D., the CTO of Green Cross, was in charge of strategy planning for Mogam Biotechnology Institute and Green Cross Research Center. Currently, he is directing the overall R&D operation.

Chang-hee Lee, M.D., a family medicine specialist, had directed Korean clinical operation of Bristol Myers Squipp before he joined Green Cross. He is in charge of domestic and international clinical operation of the company.

Se-Ho Kim, Ph.D. is in charge of developing the Hepabig-gene. It will be produced by cell culture with recombinant technology and have high –purity suitable for intravenous injections. He is behind the company's antibody product development.

Dong-ho Ahn, Ph.D., is responsible for development of cell-cultured seasonal flu vaccines (changed from egg-based vaccines). This project has been chosen as a Korean government supported program in 2011.

Exhibit 20. Core researchers of Green Cross and their careers

Core members	Position	Research Area	Career
Byung-Geon Rhee Ph.D	President	Production/R&D	Ph.D. Rice University B.S. Seoul National University
Eun-chul Huh Ph.D	CTO	R&D	Ph.D. Cornell Universtiy B.S. Seoul National University, Project manager of Mogam biotechnology Research Institute and Green Cross Research Center
Chang-hee Lee MD	Executive Director	Vaccine, Blood product, and global clinical trial	M.D. Korea University, M.B.AAjou University Director of BMS clinical operation
Se-ho Kim Ph.D	Director	Director of antibody development	Ph.D. Weizman Institute of Science (Israel) B.S. Seoul National University Director of Hepabig-gene development
Dong-ho Ahn Ph.D	Managing Director	Development of cell culture and vaccine	Ph.D. Korea institute of science and technology B.S. Korea institute of science and technology Ph.D, Assistant R&D Director, Genexin Inc.

Source: Company data

Section 7: FX exposures and sensitivities

FX sensitivities

Not exposed to significant FX risks

The company's export accounts for 16.6% total revenue in 2012F and is expected to increase to 19.3%. 95% of export is executed in US dollars. 1% fluctuation in the KRW/USD exchange rate would change 0.2% revenue and 0.8% OP in 2012F. Therefore, we believe the company's overall FX sensitivity is minimal.

Exhibit 21. FX sensitivity 2011E

Currency rate change	-5%	-1%	Base	1%	5%
Year-avg KRW/USD	1,049	1,093	1,104	1,115	1,160
Revenue (Wbn)	765.5	769.3	770.2	771.1	774.9
Operating profit (Wbn)	101.0	98.5	97.8	97.2	94.6
NP (Wbn)	101.4	98.9	98.2	97.6	95.0
EPS (W)	10,352	10,088	10,023	9,957	9,693
PER (X)	14.7	15.1	15.2	15.3	15.7
Revenue change (%)	(0.6)	(0.1)	0.0	0.1	0.6
OP change (%)	(0.4)	(0.1)	0.0	0.1	0.4
NP change (%)	(2.5)	(0.5)	0.0	0.5	2.5
EPS change (%)	(2.5)	(0.5)	0.0	0.5	2.5

Source: Company data, Leading Research Center

Exhibit 22. FX sensitivity 2012F

Currency rate change	-5%	-1%	Base	1%	5%
Year-avg KRW/USD	1,030	1,074	1,084.7	1,096	1,139
Revenue (Wbn)	847.1	852.8	854.2	855.6	861.3
Operating profit (Wbn)	117.8	116.5	116.2	115.8	114.5
NP (Wbn)	118.1	116.8	116.5	116.1	114.8
EPS (W)	12,052	11,919	11,885	11,852	11,719
PER (X)	12.6	12.8	12.8	12.8	13.0
Revenue change (%)	(0.8)	(0.2)	0.0	0.2	0.8
OP change (%)	(0.4)	(0.1)	0.0	0.1	0.4
NP change (%)	(4.0)	(0.8)	0.0	0.8	4.0
EPS change (%)	(4.0)	(0.8)	0.0	0.8	4.0

Source: Company data, Leading Research Center

Exhibit 23. FX sensitivity 2013F

Currency rate change	-5%	-1%	Base	1%	5%
Year-avg KRW/USD	966	1,006	1,016.5	1,027	1,067
Revenue (Wbn)	939.4	946.8	948.6	950.4	957.8
Operating profit (Wbn)	138.7	138.5	138.5	138.4	138.3
NP (Wbn)	138.9	138.7	138.7	138.6	138.5
EPS (W)	14,178	14,158	14,153	14,148	14,129
PER (X)	10.7	10.7	10.7	10.7	10.8
Revenue change (%)	(1.0)	(0.2)	0.0	0.2	1.0
OP change (%)	(0.4)	(0.1)	0.0	0.1	0.4
NP change (%)	(4.7)	(0.9)	0.0	0.9	4.7
EPS change (%)	(4.7)	(0.9)	0.0	0.9	4.7

Source: Company data, Leading Research Center

Section 8: Operations overview

The company already has a firm foundation for vaccines and blood derivatives. Now, it is planning to expand its business parameters to new biologics and biobetters.

Vaccines

Best domestic vaccine developer

The growth of emerging markets (Brazil, India, and China) and the release of new vaccine products will contribute to a large increase in its market size. The global market size for vaccines was $28.0bn in 2010 and is expected to increase by more than 100% by 2018F reaching up to $68.5bn according to 2011 Visiongain report.

Korea mandates vaccinations for fourteen different diseases and recommends that all infants are vaccinated. In an effort to invigorate the R&D of domestic pharmaceutical companies, the government makes 50% of its vaccine purchases from domestic firms. Green Cross greatly benefits from the policy as it has the most vaccine products in the country.

The company's advanced vaccine development technology was proven during the outbreak of the swine influenza virus (H1N1). The virus was classified phase 6, the most dangerous level in the WHO's classification system. Only five months after obtaining the strain of the virus from National Institute for Biological Standards and Control (NIBSC), the company was able to release Green Flu S (a swine flu vaccine for infants). Two months later, Green Cross developed Green Flu S+ (a swine flu vaccine for adults), preventing the further spread of swine flu in Korea. Although the vaccines for swine flu did not contribute much to the company's revenue in 2011 (as the pandemic has disappeared), they demonstrated the company's outstanding vaccine development technology.

Globally recognized vaccine development technology – Gradual increase in export expected through participating in a bid for seasonal flu vaccines

GC Flu (a vaccine for seasonal influenza) and Green Flu S+ were approved by the WHO and are ready to compete with products from other global vaccine manufacturers. The company has participated in bids for the South American seasonal influenza vaccine sales and is expected to win a contract worth $10.0mn (the total sales size is worth $50mn). The $10.0mn contract is less than anticipated. However, it has paved the way to export vaccine under WHO and can generate revenue from other markets as well (2012 seasonal flu vaccine sales for northern hemisphere and Mexico, etc) Green Cross is expected to start exporting these vaccines for South America in March 2012.

Universal influenza vaccine under development utilizing cell culture technology

The company is in the process of developing vaccines for seasonal influenza using the cell culture method (the company has been using egg-based vaccines until now). Cell culture method has a few advantages over egg-based vaccines. First, production length for cell culture method is shorter (2~3months). Also, cell culture does not require the collection of eggs, a process which makes a quick response to abrupt virus outbreaks more difficult. As such, many global firms are focusing on developing cell culture method. Green Cross is utilizing the widely used Madin-Darby canine kidney cell and disposable bioreactors produced by PBS for cell culture. The company's culture cell vaccines are currently in a pre-clinical trial process and are expected to be launched in 2014. Vaccine development by cell culture is a government backed project, so the company will be receiving W18.0bn over the next six years (Exhibit. 25)

Mass production of flu vaccines is difficult because the vaccines need to be changed every year. The WHO chooses the three most widely spread strains of flu from the previous year, and vaccine manufacturers produce the current year's vaccines using

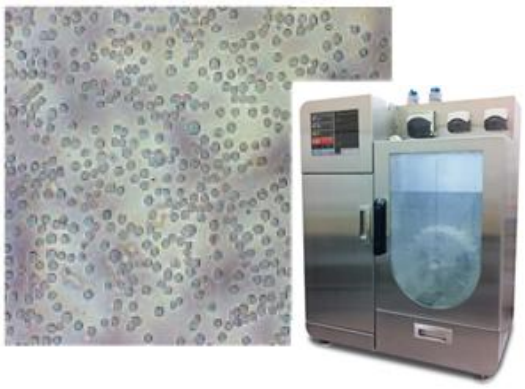
the three strains. This leaves room for other strains (usually mutants) to be spread, as they are unaffected by the vaccine. In order to counter such difficulty, many firms, including Green Cross, are trying to develop a universal influenza vaccine. In 2009, it was reported that contrary to popular belief, different strains of the virus have commonalities that could possibly be exploited by a single vaccine. Using those similarities, several firms are attempting to develop universal influenza vaccines that can fight against multiple types of viruses (Exhibit 24,26).

Exhibit 24. Global universal flu vaccines development status

Products	Companies	Dev. status	Note
Flu-v	SEEK	Phase 2	
Multimeric-001	BiondVax Pharma	Phase 2	
N/A	Green Cross	Pre-Clinical	N/A
CR6261 CR8020	Crucell	Pre-Clinical	Collaborating with Johnson & Johnson
Vacc-Flu	Bionor Pharma	Pre-Clinical	

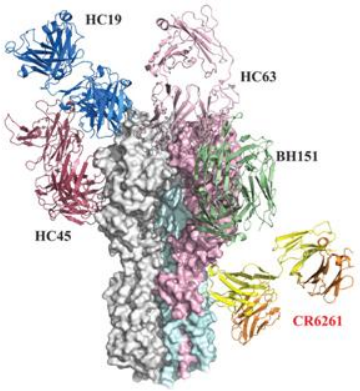
Source: Company data, Leading Research Center

Exhibit 25. Disposable bioreactor for cell culture



Source: Company data

Exhibit 26. 3D feature of Crucell's universal influenza vaccine, CR6261



Source: Science (2009)

Firm pipeline for vaccines

The company developed the world's second vaccine against chickenpox and is developing the 2nd generation product using a new cell line. The market size for the chickenpox vaccine is at $2.5bn (2010), and the company's goal is to account for 4% of the world's market share (annual revenue of $0.1bn). Currently, there are only two other competing chickenpox vaccines – Merck's Varivax and GSK's Varilrix.

Its vaccine development pipeline covers a wide range of other infectious diseases (Exhibit 27). Vaccines against avian flu (H5N1), tetanus, and bacillus anthrasis (the Anthrax pathogen), are in phase 2 clinical trial. The company is in the process of developing DTaP (a vaccine for tetanus, diphtheria, and pertussis) which is safer and has fewer side effects compared to DTwP. DTaP uses only a portion of the Bordelella Pertussi virus, while DTwP uses the whole virus and DTaP uses a part of virus requiring more sophisticated production technology.

Exhibit 27. Green Cross' Vaccine Pipeline

Products	Indication	Pre Clinical	Clinical Trial			Note
			P1	P2	P3	
MG 1109 GC 1107 GC 1109	Avian Flu Td for adults Anthrax Tuberculosis Seasonal Flu Chickenpox DTaP Malaria Dengue					Vaccine for tetanus and diphtheria Cell culture method development Vaccines for tetanus, diphtheria, and pertussis

Source: Company data, Leading Research Center

Blood derivatives

Blood can be either transfused into patients or separated in its components for special therapeutic uses. Components that can be separated from blood are albumin, immunoglobulin, and other agents. The company has already 16 blood-derived products.

Undergoing clinical trials in the United States

The company has Factor VIII for hemophilia. Factor VIII can be separated from blood, but the company marketed the GreenGene F utilizing recombinant DNA technology in Korea in 2010. The current global market size for Factor VIII reaches up to $5.6bn and the recombinant drugs account for 75% of the total market share. Green Cross is planning a clinical trial in the U.S starting in 2Q12, and the product is expected make its launch in the U.S market in 2014. The expected annual revenue is $0.34bn (a 0.8% share of the total recombinant Factor VIII market).

Exhibit 28. Hemophilia drugs Factor VIII

Products	Company	Generation	2010 Revenue	Note
GreenGene F	Green Cross	3rd	KRW0.33bn	Released in Korea in 2010 3rd phase of clinical trial planned in the U.S in 2H12 Expected to be released in the U.S in 2014
Advate	Baxter	2nd	US$1.7bn	
Kogenate FS	Bayer	2nd	€1.0bn	
Helixate FS	Bayer/CSL Behring	2nd	US$0.573bn	
Xyntha	Pfizer	4th	US$0.384bn	

1st generation : Human or animal protein used in culture medium and stabilizing agent.
2nd generation : Human or animal protein used in culture medium but not for stabilizing agent.
3rd generation : Both human and animal protein not used in culture medium nor for stabilizing agent.
4th generation : same as the 3rd generation, animal antibody has not used in purification process.
Source: Companies 2010 Annual report, Company data, Leading Research Center

Intravenous immunoglobulin (IVIG)for immunodeficiency patients is in the phase 3 clinical trial in the US and is expected to be marketed in 2014~2015. Approximately ten companies are competing in this market. The market size reaches up to $5.5bn (2010), and Green Cross is expected to have revenue of $0.2bn (4% market share).

Consistent expansion for blood centers and plants export

In order to obtain the required supply of blood (the core material for blood-derived products), the company has acquired three blood banks (two banks in 2010, one bank in 2011) in the US. Blood banks in the US supply 120,000 liters of blood annually.

Green Cross has proven its technology for blood separation and related manufacturing skill, enabling the export of a production plant to Thailand. The total technology transfer fee was $61.6mn, and this amount will be paid over a three year period starting in 2012. The company is expected to export additional such plants to emerging markets in the near future.

Biologics – (Protein, Antibody)

Protein drugs and antibodies

Green Cross is developing an antibody which neutralizes hepatitis B virus. While previous products used nonspecific antibodies separated from blood, GC1102 is specific for hepatitis B. Moreover, utilizing recombinant technology with cell culture makes mass production possible. In addition, this antibody is able to neutralize mutated Hepatitis B (G145R) virus. Green Cross has already completed phase 1 clinical trialand is planning to launch the product in 2013.

Developing biobetters for rare diseases to carve out the niche market

The company is also making efforts to develop biobetters for rare diseases. Hunter's syndrome and Fabry disease are genetic disorders occurred only in male by protein deficiency related sex chromosome.

Hunter's syndrome with deficiency of protein called iduronate-2-sulfatase causes gloycosaminoglycans (GAG) to remain in the body instead of being dissolved. Accumulated GAGs eventually damage organs and are potentially fatal. The disease only affects one out of every 100,000 males. Fabry disease with alpha-galactosidase deficiency makes patients unable to dissolve fat in their bodies. Accumulated fat damages the kidneys and causes various heart diseases. The mobility rate of this disease is about 1 out of every 40,000 adult males. The only plausible therapy for such patients is to administer deficient proteins for their life time. The cost of such regime is approximately $25,000 annually and is usually covered by health insurance in most countries including Korea.

Currently, Elaprase (Shire) is the only drug for Hunter's syndrome, and Replagal (Shire) and Fabrazyme (Genzyme) for Fabry's disease. Green Cross has completed domestic clinical trials for Hunter's syndrome medication (GC1111), and plans to launch it in Korea in 2012. The drug will be available for sale in Europe and South America from 2015. Furthermore, the company is in the process of developing the drug for Fabry's disease with a goal of domestic launch in 2013 and the U.S. and Europe in 2016.

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Herceptin: Biobetters over biosimilars

Green Cross is also developing biobetters to enhance efficacy or lengthen the therapeutic duration of existing products. For example, the company is cooperating with Macrogenics to develop MGAH 22, which is the improved version of a breast cancer drug, herceptin. Breast cancer patients overexpress Her2 receptors. Depending on how many receptors manifest, cancer patients can be classified into different groups (0 signifies a normal condition and 3+ shows that the patient is in the worst condition). As of now, herceptin is only allowed for cancer patients classified as 3+. MGAH 22 is undergoing the phase 1 clinical trials in both the US and Korea.

Drugs for leucopenia (GC-PGC) and anemia (GC1113) are in phase 3 and phase 1 clinical trial, respectively. The main goal of the trial is to see the effect of biobetters on the duration of therapeutic effects.

Exhibit 29. Biologics and biobetters development status of Green Cross

Products	Indication	Pre-Clinical	Clinical Trial P1	Clinical Trial P2	Clinical Trial P3	Note
Biomedicine						
GC 1102	Liver transplantation	→				• Antibody for Hepatitis B virus • Products manufactured through cell culture with recombinant technology
	Greenstatin		→			•Anti-angioneogenesis substance – Protein drug, Apolipoprotein • Undergoing clinical trials in both Korea & U.S.
Biobetter						
GC 1111	Hunter's syndrome			→		• Launching in Korea in 2012 (Annual revenue of W20bn) • Releasing in China in 2014, EU and South America in 2015 • Competing drug : Elaprase (Shire) • Global market size $404mn, Expected market share of 30% ($121m)
	Fabry disease			→		• Launching in Korea in 2013, in EU/US in 2016 • Competing drugs : Replagal (Shire), Fabrazyme (Genzyme) • Global Market Size US$622m, Expected M/S : 20% (US$100m)
MGAH 22	Breast cancer	→				• Breast cancer drug Herceptin's (Her2+) biobetter • Target for both Her2 +/- patients • Partnership with Macrogenics, Possessing sales right in Korea.
GC PGC	Leukopenia			→		• Extending the therapeutic duration • Competing drug : Neulasta (PEG-G-CSF, Amgen)
GC 1113	Anemia			→		• Competing drug : Mircera (PEG-Epo, Roche) on sales, Hematide (PEG-Epo, Affymax/Takeda) NDA submitted

Source: Company data, Leading Research Center

Developing other chemical drugs that include anti-blood coagulation drugs

Green Cross has a pipeline for other drugs that do not fall in previously mentioned categories. Collaborating with Jennerex (US), the company is developing JX-594 (Vaccinia virus as an anti-cancer drug), which is currently under phase 2 clinical trial. GCC4401C (an antithrombotic) inhibits Factor Xa involved in coagulation process, therefore, targeting patient with high blood pressure or used as anti- thrombotic drug.. This drug was originated from LegoChemBio and is in phase 1 clinical trials in Korea (U.S clinical trials are planned in 2012). The global market size of antithrombotic drugs was approximately $20.0bn in 2010 (domestic market size is at W400bn), and there are already several marketed drugs. However, we believe Green Cross has an opportunity to make a profit based on the quality of its medicines.

Exhibit 30. Global antithrombotic development status (weakening Factor Xa)

Products	Company	Dev. status
GCC4401C	Green Cross	Phase 1
Xarelto	Bayer	launched in the U.S in 2011
Eliquis	Pfizer/BMS	Phase 3
Edoxaban	Daiichi Sankyo	Phase 3
Otamixaban	Sanofi-Aventis	Phase 3

Source: Annual report, Leading Research Center

The future strategy of Green Cross

Stabilization: Maximizing its strengths

Core businesses: Vaccine, blood products (existing products) + antibody/protein drugs (business expansion)

The company's main products, vaccines and blood-driven products, have a developmental history that goes back 30~40 years. Green Cross has been a pharmaceutical pioneer, as some of it was the first Korean maker for some types of medicines. Some of Green Cross' products were also the first of their kind in the world (Exhibit 31). The company is focusing on strengthening its core products (vaccines and blood-driven products), and maintaining its leading position in the market. Furthermore, the company is planning to expand its antibody and protein drug business. For all these strengths, Green Cross is well-recognized not only in Korea but also globally. The company is planning to export its seasonal influenza vaccine in 2012 and increase the revenue proportion from exports. We believe revenue from exports will account for 20% of the total revenue by 2013F. (Exhibit 33)

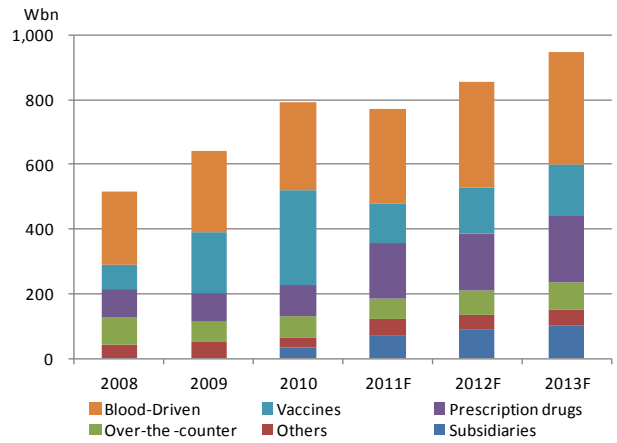
Exhibit 31. History of flagship products of Green Cross

Product group	Products	Released in	Note
Vaccine	Hepavax (Hepatitis B)	1983	Third in the world
	Hantavax(Epidemic hemorrhagic Fever)	1988	First in the world
	Chicken Pox vaccine	1993	Second in the world
Blood-drived	Began plasma fraction	1971	First in Korea
	Antihemophillic Factor	1974	
Protein drugs	Urokinase (Stroke)	1973	Separated from urine

Source: Leading Research Center

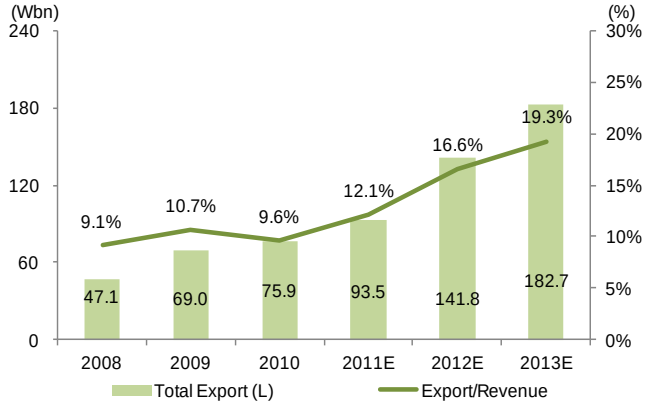
On August 12th 2011, the Korean government announced steep price cut on generic drugs whose patent of original drug has expired. It also implemented ban on rebate practice between drug companies and doctors prescribing their drugs. These policies will negatively affect generic drug producers in 2012. However, Green Cross' flagship products are vaccines and blood-driven products, making up 75% of the company's total revenue in 2010. Therefore, the effect of the policy changes on Green Cross will be minimal. Prescription drugs (both original and generic drugs) account for only 13% of the company's revenue in 2010. As such, Green Cross will be the Korean pharmaceutical company least affected by these policies.

Exhibit 32. Revenue breakdown by product group



Source: Company data, Leading Research Center

Exhibit 33. Export trend of Green Cross



Source: Company data, Leading Research Center

Necessary element for the growth of a pharmaceutical firm – Investment in R&D

Given the fact that the management of the company realizes the importance of R&D, its R&D investment is one of the highest in the industry. The company is planning to increase the investment in R&D every year and eventually spend up to W90bn by 2013. A large portion of R&D expense consists of development costs. The company is also planning to increase the number of researchers from approximately 300 to 450 by 2013. Furthermore, an additional lab is under construction, and is expected to be completed in 2013. Finally, the company is planning to improve its existing manufacturing facilities to satisfy U.S. FDA's Current Good Manufacturing Practice (cGMP) requirements in order to make an entry into developed countries' market (estimated upgrading cost is W65bn).

Exhibit 34. R&D costs on different business areas

Year		2010	2011E	2012E	2013E
Total development costs(Wbn)		560	600	850	900
R&D costs breakdown	Vaccine	5%	5%	8%	10%
	Blood product	50%	55%	55%	50%
	Antibiotic/Protein	20%	25%	20%	20%
	Other biomedicine	25%	15%	17%	20%

Source: Company data, Leading Research Center

Differentiation: No to biosimilars

Focusing on biomedicines and biobetters

Recently, many domestic pharmaceutical/biotechnology firms are focusing on biosimilar market. However, Green Cross is keeping its concentration on new biologics and biobetter.

Green Cross' cell culture and gene recombination technology, vital technologies for biological products, have proved its excellence with existing products. Due to the fact that new biologics and biobetters have higher profit margin and less competition, Green Cross did not enter the biosimilar market even though it was the first domestic firm to develop a such product (α-interferon, 1981).

Potential risks related to biosimilar market

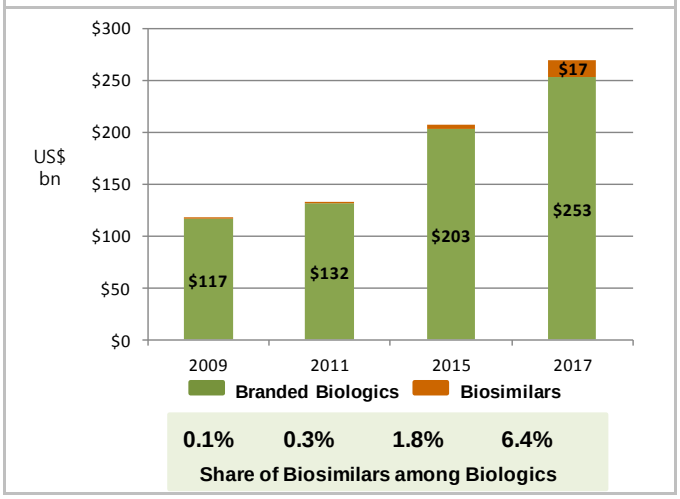
There are various risks related to biosimilar market. First, many competitors with sufficient technical and financial resources are entering the market, attracted by the market size of original drugs. This will eventually cause overpopulation in the market. ("Industrialization of mAb production technology" B. Kelly mAbs, 2009, "How to tackle overcapacity in monoclonal antibody production" Gail Button Genetic Engineering & Biotechnology News Feb 2010, "Current landscape and strategies in development of biosimilars in the emerging markets" George Wang 2011 AAPS Biotech conference). The other risk is defense strategy by the innovators. For example, Enbrel, a rheumatoid arthritis drug from Roche/Amgen, recently got awarded with another patent (US 8063182) in November, 2011. Even though legal challenge is expected by companies developing biosimilar version, biosimilar version may not be able to enter the market until 2028 due the newly issued patent. Another typical strategy of innovator is to roll out a bio-better(2nd generation) near patent expiration date of the original drug (1st generation). For Roferon (α-interferon), Roche introduced a biobetter version (Peasys) when Roferon's patent set to be expired on 1997. Pegasys took over entire Roferon market and no biosimilar of Roferon is currently on the major markets.

Due to such risks, it is expected that biosimilar would erode only 6.7% of entire biologics market by 2017 (Exhibit 36).

Exhibit 35. Leading biosimilar developers

Source: Leading research center

Exhibit 36. Biosimilar Market size prediction 2009~2017



Source: Trends in Biosimilars, Quintiles, Bio Korea (2011)

Growth strategy: Expecting over W2.0trn of revenue by 2018

Plan to enter advanced markets that account for 80% of total medicine/bio industry

Green Cross is planning to expand oversee's sales on vaccines, new biologics, and biobetters in order to avoid stringent domestic market regulation by Korean government.. To better focus its technical and financial resources, the company is currently developing six products to increase the revenue in developed countries (US, EU) and in the South American market. Green Cross is not expecting such intense competition for these products, as the specialty pharma market size is too small for large global pharmaceutical firms to enter. In addition, the time and costs for clinical trials are much less than those for other new medicines. For example, clinical trials for GreenGene F, IVIG, Hunter's syndrome, and Fabry disease require 60~100 patients and 2 to 3 years of time to complete the clinical development. Furthermore, instead of conducting typical three phase trials, drugs for these diseases only require only phase 3 trial to seek marketing approval. The projected international sales from these drugs are expected to record $1.0bn by 2018F. The company believes it can complete the clinical development of these drugs in U.S. with its own technical and financial resources.

Exhibit 37. Products under development to enter international market

Product Group	Products	Expected launch date	Annual Revenue (US$bn)		Competitors
			Global	Green Cross goal (Desired M/S %)	
Vaccine	Seasonal Flu vaccine	2012: South America 2013: United States	5.0	0.2 (4%)	Firms that are eligible to participate in WHO bid for vaccines : Green Cross Navartis, Sanofi, GSK
	Chickenpox vaccine	2015	2.5	0.1 (4%)	Merck, GSK
Blood products	Greengene-F	2014: United States	4.2	0.3 (8%)	Baxter, Bayer, Pfizer
	I.V Globulin S	2015: United States	5.5	0.2 (4%)	10 Firms (Baxter, CSL, Talecris etc.)
Protein drugs for rare diseases	GC 1111 (Hunter's syndrome)	2015: Europe South America	0.353	0.1 (30%)	Shire
	Fabry disease	2016: Europe United States	0.622	0.1 (20%)	Shire, Genzyme
		Total annual revenue	22.68	1.0 (4.4%)	

Source: Company data, Leading Research Center

Representing Korean biotechnology industry with constant growth

2011E: Despite of the lower revenue from Swin Flu vaccines, the company's revenue will only decrease by a minimal amount

2011E revenue is expected to be W770bn. Due to the waning demand for swine flu vaccines (2009~2010), we are expect revenue from vaccine sales to decline by W160bn. However, the outstanding performance of Greengene F and sales of products from other firms will limit the loss to 3% compared to 2010.

The company's revenue will maintain the steady revenue growth in spite of the price cut on drugs

2012F revenue is expected to increase by 11% YoY, totaling W850.0bn. Increased sales from seasonal flu vaccines with orders from the WHO and its own marketing will contribute to these revenue figures. The drug launch for Hunter's syndrome (GC1111) will also boost revenue for 2012F. Despite the domestic price depreciation policy on prescription drugs, the company will only be minimally affected, as generics only account for a small portion of total revenue.

2013F revenue growth will be approximately 11%, reaching W930bn thanks to the consistent growth of vaccine exports, the increased revenue proportion of biomedicine sales, and the domestic release of the Fabry vaccine.

Exhibit 38. Revenue prediction for different business areas

(Wbn)	10		11E		12F		13F	
	Rev.	%	Rev.	%	Rev.	%	Rev.	%
Totral Revenue	791.3	100.0	770.2	100.0	854.2	100.0	948.6	100.0
Blood Derivatives	270.8	34.2	293.3	38.1	324.6	38.0	348.8	36.8
Vaccine	292.7	37.0	120.3	15.6	144.3	16.9	159.3	16.8
Prescription drugs (including antibody, protein)	98.9	12.5	170.0	22.1	174.6	20.4	203.7	21.5
Over-the-counter/Well-being	64.7	8.2	64.3	8.3	74.0	8.7	84.1	8.9
Others	30.6	3.9	49.3	6.4	46.5	5.4	49.9	5.3
Revenue from subsidiaries	33.6	4.2	73.0	9.5	90.2	10.6	102.8	10.8

Source: Company data, Leading Research Center

Section 9-1: Valuation – Peer Valuation

Korean market: Dong-A Pharm., Yuhan Corp.
International market: Biogen Idec, CSL, Genzyme

Not overvalued compared to peer companies in Korea

There are two domestic pharmaceutical firms suitable for peer valuation: Dong-A Pharm (000640 KS) and Yuhan Corp (000100 KS). Based on the comparison, Green Cross has noticeably higher OPM and ROE than the rest, resulting in a higher PER. However, considering the fact that three companies have similar EV/EBITDA, Green Cross' high PER is not too overvalued.

Biogen Idec (BIIB, NASDAQ), Genzyme (acquired by Sanofi-Aventis in 2011), and CSL (Austrailia) were included in peer valuation because they are focusing on the similar business area as Green Cross. Compared to their high rate of OPM (28%~40%), Green Cross's 14% OPM can seem relatively low. However, considering international firms are already in mature stage with steady revenue stream and high profit margin from its innovative drugs, this difference can be easily explained.

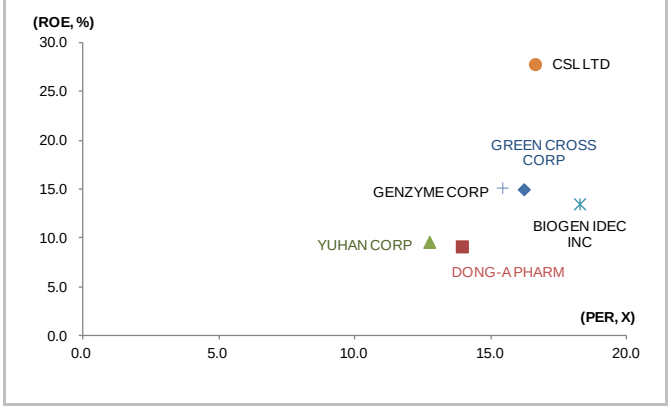
Exhibit 39. Peer valuation comparison

Name	Ticker	Ctry.	Market Cap. (US$m)	Revenue (US$m)				OPM (%)			
				09	10	11E	12E	09	10	11E	12E
GREEN CROSS	006280 KS	KOR	1,253.6	363.7	424.4	664.7	769.6	9.1	13.5	12.4	14.3
DONG-A PHARM	000640 KS	KOR	875.7	682.7	819.9	856.5	932.1	11.7	13.4	11.5	10.3
YUHAN CORP	000100 KS	KOR	1,226.1	509.7	574.1	619.8	717.3	13.4	12.5	10.4	10.6
BIOGEN IDEC INC	BIIB US	USA	27,998.7	4377.3	4716.4	5011.4	5261.6	29.6	33.3	40.2	40.1
CSL LTD	CSL AU	AUS	17,093.0	3931.2	4145.7	4405.3	4644.5	32.3	30.0	28.2	27.4
GENZYME CORP *	GENZ US	USA	18,440.2	3977.3	4048.7	4976.3	5563.1	14.5	4.8	28.3	28.4

Name	PER (X)				EV/EBITDA (X)				P/B (X)				ROE (%)			
	09	10	11E	12E	09	10	11E	12E	09	10	11E	12E	09	10	11E	12E
GREEN CROSS	16.9	14.7	19.8	16.2	13.5	9.4	12.5	9.6	3.5	2.8	2.4	2.1	22.4	22.4	14.0	15.0
DONG-A PHARM	19.8	17.4	13.4	13.9	12.3	9.2	7.8	7.6	2.4	1.8	1.4	1.3	13.4	13.4	9.1	9.1
YUHAN CORP	15.6	15.0	13.7	12.7	12.9	13.8	11.8	10.7	1.8	1.7	1.4	1.3	12.2	12.2	10.9	9.6
BIOGEN IDEC INC	13.1	13.8	19.6	18.3	8.5	8.4	11.7	10.9	2.4	3.0	4.4	3.7	21.3	21.3	21.6	13.5
CSL LTD	17.5	19.0	18.1	16.6	10.9	12.1	12.0	11.6	4.2	4.8	4.6	4.5	24.1	24.1	27.3	27.8
GENZYME CORP *	29.5	43.7	17.5	15.4	11.9	26.3	26.3	N/A	1.7	2.4	2.4	N/A	1.8	1.8	15.2	N/A

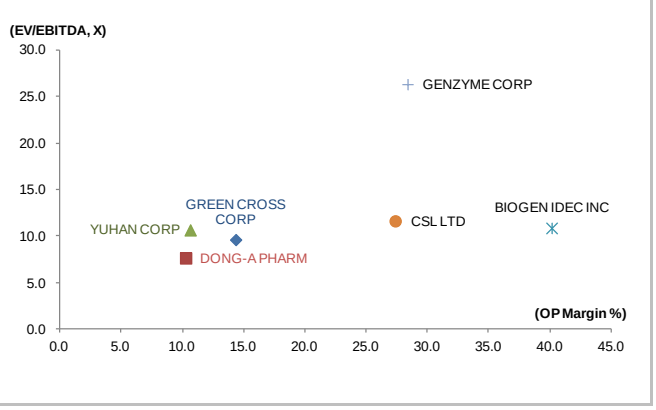
Source: Company data, Bloomberg, Leading Research Center (as of Jan. 6, 2012)
There are some missing information on 2012 consensus data on Genzyme because it was merged by Sanofi-Aventis in 2011

Exhibit 40. A peer group PER vs. ROE



Source: Bloomberg, Leading Research Center

Exhibit 41. A peer group EV/EBITDA vs. OPM



Source: Bloomberg, Leading Research Center

Business structures of International special pharma firms

Product portfolios of three international firms used for peer valuations are shown below.

Exhibit 42. 2010 revenue breakdown for Biogen Idec.

Product group	Products	2010 Revenue (US$m)
Cure for multiple sclerosis	Avonex	2,518
	Tysabri	900
	Others	52
Antibody against cancer	Mabthera/Rituxan (Joint marketing with Roche)	1,077
Others		169
	Total revenue	**4,716**

Source: Biogen Idec 2010 Annual report

Exhibit 43. 2010 revenue breakdown for Genzyme

Product Group	Indication	Product	2010 Revenue (US$m)	
			Rev. from each product	Rev. from the product group
Lysosomal storage disorder	Gaucher disease	Cerezyme	720	**1,653**
	Fabry	Fabrazyme	188	
	Pompe disease	Myozyme/Lumizyme	412	
	Hurler syndrome	Aldurazyme	167	
		Others	166	
Kidney/endocrine system disorder	Chronic kidney disorder	Renagel/Renvela	698	**1,069**
	Secondary hyperaraththyrodism	Hectorol	190	
	Thyroid cancer	Thyrogen	182	
Biosurgery	Arthritis	Synvisc/Synvisc-One	393	**583**
	Arthritis	Sepra	161	
		Others	28	
Hematology, oncology	Stem cells	Mozobil	92	**679**
	Kidney transplant	Thymoglobulin	230	
	Leukemia in children	Clolar	104	
		Others	253	
Others			17	**17**
			Total revenue	**4,001**

Source: Genzyme 2010 Annual report

Exhibit 44. 2010 revenue breakdown for CSL

Product group	2010 Revenue (AU$m)
Immunoglobulin (40%)	**1,675**
Blood product (24%)	**988**
Helixate (12%)	**503**
Others (24%)	**1,005**
Total revenue	**4,188**

Source: CSL 2010~2011 Annual report

Section 9-2: Valuation – Target Price W 225,000

Green Cross has both stability and growth potential

Green Cross is traded at 3.4% discount to the 2012 year-high domestic pharma/bio industry PER. However, considering its stability and growth potential, it deserves a premium to the industry average PER because

- Solid business structure will guarantee its survival even under the steep price-cut in prescription drugs in the domestic market.
- Cash and equivalent of W60bn gives the company an opportunity for further investment
- Strong product line for blood-driven products and vaccines
- Development of new biologics and biobetters for future growth, carving out the niche market which can avoid the competition with major global firms
- Aggressive but very effective R&D investment that is vital for entering the international market

Upside potential of 50%

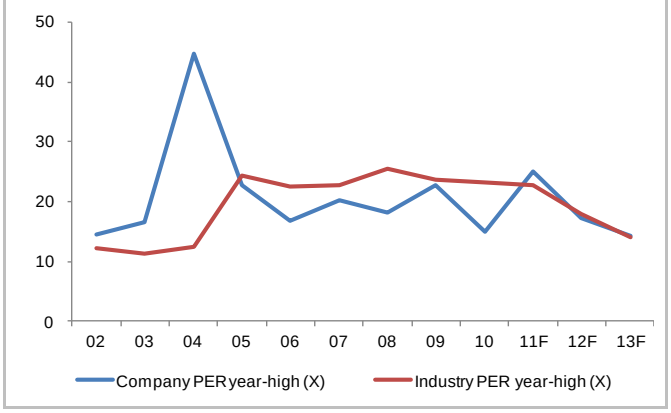
Although there are many pharmaceutical firms in Korea, only few companies including Green Cross are capable of developing a new drug. Furthermore, Green cross is one of a few firms that have both stability and growth potential. Therefore, we apply 50% premium to the pharma/bio industry year high PER of 17.9X (2012F) which renders 26.0X. Using the 2012F EPS of W8,669 and PER of 26.0X, we derive a fair share price of W225,000.

Exhibit 45. Green Cross valuation VS. Inudstry Valuation

(X, %)	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011E	2012F	2013F
Green Cross year-high PER (X)	14.5	16.7	44.8	22.8	16.8	20.3	18.1	22.8	15.0	25.0	17.3	14.3
Industry year-high PER (X)	12.3	11.3	12.5	24.4	22.4	22.8	25.6	23.6	23.3	22.8	17.9	14.2
Premium/(Discount) to market (%)	18.5	47.9	258.6	(6.3)	(25.1)	(11.1)	(29.3)	(3.5)	(35.4)	9.6	(3.4)	1.4
Green Cross year-low PER (X)	3.3	3.7	30.1	8.3	10.4	10.0	12.9	8.7	9.4	15.6	17.1	14.3
Industry year-low PER (X)	8.0	7.5	7.4	9.4	15.9	15.2	13.2	14.0	17.9	16.9	17.7	14.2
Premium/(Discount) to market (%)	(58.8)	(50.7)	307.8	(11.6)	(34.7)	(34.2)	(2.1)	(37.9)	(47.5)	(7.7)	(3.0)	1.4

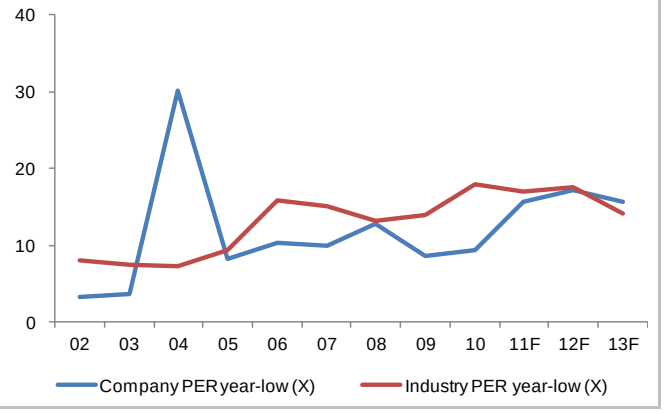
Source: Company data, Leading Research Center
**Market = KOSPI + KOSDAQ,*

Exhibit 46. Green Cross PER high vs. Industry PER high



Source:Fnguide, Leading Research Center

Exhibit 47. Green Cross PER low vs. Industry PER low



Source: Fnguide, Leading Research Center

Summary of financials

Income Statement

(Wbn)	01	02	03	04	05	06	07	08	09	10	11F	12F	13F
Revenue	**56.1**	**46.3**	**104.4**	**142.0**	**372.4**	**405.1**	**442.3**	**516.1**	**643.2**	**791.0**	**770.2**	**854.2**	**948.6**
% chg yoy	9.2	(17.5)	125.5	36.0	162.3	8.8	9.2	16.7	24.6	23.0	(2.6)	10.9	11.1
COGS	37.7	30.7	69.9	94.8	238.0	240.5	261.9	311.9	373.5	476.3	501.4	553.5	596.7
Gross profit	**18.4**	**15.6**	**34.5**	**47.1**	**134.4**	**164.7**	**180.4**	**204.2**	**269.7**	**314.7**	**268.8**	**300.7**	**351.9**
GP margin (%)	32.7	33.6	33.0	33.2	36.1	40.6	40.8	39.6	41.9	39.8	34.9	35.2	37.1
SG&A	**21.4**	**15.7**	**27.1**	**42.1**	**100.4**	**109.8**	**122.0**	**136.3**	**150.4**	**169.1**	**171.0**	**184.5**	**213.4**
Adjusted OP	**(3.0)**	**(0.1)**	**7.3**	**5.0**	**34.0**	**54.9**	**58.4**	**67.9**	**119.4**	**145.6**	**97.8**	**116.2**	**138.5**
Adj. OP margin (%)	**(5.4)**	**(0.3)**	**7.0**	**3.5**	**9.1**	**13.5**	**13.2**	**13.2**	**18.6**	**18.4**	**12.7**	**13.6**	**14.6**
Net other incomes	38.9	8.3	0.3	0.7	13.6	0.1	4.2	(19.9)	1.2	(2.6)	(2.6)	(2.9)	(3.2)
Reported OP	**(3.0)**	**(0.1)**	**7.3**	**5.0**	**34.0**	**54.9**	**58.4**	**67.9**	**119.4**	**145.6**	**95.2**	**113.3**	**135.3**
Net equity method gains	0.0	0.0	(1.9)	(1.2)	(1.3)	(0.0)	1.2	0.5	(1.2)	(2.6)	(3.0)	(2.5)	(2.5)
Interest incomes	0.3	1.3	0.9	1.2	0.7	1.0	1.0	18.0	1.3	2.5	3.1	3.3	3.7
Interest expenses	5.8	4.6	1.0	2.4	3.8	7.2	4.7	7.3	16.0	6.5	5.5	6.3	7.3
Profit before tax	30.4	4.8	5.6	3.3	43.2	48.8	60.1	59.2	104.7	134.7	92.8	110.3	131.7
Tax	0.0	0.0	(1.6)	(3.8)	13.6	14.0	15.8	10.3	24.1	30.0	21.3	25.4	30.3
Tax rate (%)	0.0	0.0	(0.3)	(1.2)	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Net profit	**30.4**	**4.8**	**7.2**	**7.0**	**29.6**	**34.8**	**44.4**	**48.9**	**80.5**	**104.7**	**71.5**	**84.9**	**101.4**
Controlling	0.0	0.0	7.2	6.8	29.1	34.8	0.0	0.0	0.0	104.7	69.3	82.4	98.4
Non-controlling	0.0	0.0	0.0	0.3	0.5	(0.0)	0.0	0.0	0.0	0.0	2.1	2.5	3.0
Other comprehensive inc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total comprehensive	30.4	4.8	7.2	7.0	29.6	34.8	44.4	48.9	80.5	104.7	71.5	84.9	101.4

Balance Sheet

(Wbn)	01	02	03	04	05	06	07	08	09	10	11F	12F	13F
Current Assets	**80.7**	**44.0**	**47.0**	**158.0**	**182.3**	**214.3**	**220.7**	**302.9**	**459.1**	**475.8**	**525.6**	**567.4**	**634.4**
Cash and equivalents	50.0	3.1	2.8	16.7	14.5	14.9	5.8	11.6	22.2	30.9	31.6	25.3	32.5
Marketable securities	0.0	27.4	2.8	2.0	1.5	0.1	6.7	14.4	53.8	105.4	109.7	107.2	119.3
A/R	25.6	7.3	25.7	63.3	88.0	109.5	125.2	164.1	171.3	148.9	181.0	203.3	232.4
Inventory	6.6	6.9	14.9	72.7	78.2	86.8	82.4	112.5	211.7	189.9	203.1	231.4	250.0
Other current assets	(1.4)	(0.6)	0.8	3.3	0.1	3.0	0.5	0.4	0.1	0.7	0.2	0.2	0.2
Non-current Assets	**51.2**	**30.4**	**41.1**	**92.8**	**114.4**	**148.4**	**204.9**	**246.5**	**253.9**	**265.5**	**296.5**	**352.1**	385.2
Tangible Assets	31.4	24.5	31.3	60.1	71.1	98.6	148.3	195.8	196.1	215.8	244.3	297.6	325.9
LT financial assets	16.7	1.2	0.8	14.7	29.1	33.2	38.0	19.9	12.4	12.4	10.3	11.0	12.2
Inv in related co's	0.0	4.2	2.5	0.6	0.6	0.6	0.9	7.7	21.8	18.8	20.0	20.5	21.0
Other non-current assets	3.1	0.6	6.5	17.4	13.6	15.9	17.7	23.2	23.6	18.6	21.9	23.0	26.1
Total Assets	**131.9**	**74.5**	**88.1**	**250.8**	**296.7**	**362.7**	**425.6**	**549.4**	**713.0**	**741.3**	**822.0**	**919.4**	**1,019.6**
Current Liabilities	**55.0**	**14.1**	**45.9**	**136.1**	**129.7**	**139.9**	**129.7**	**194.9**	**269.2**	**146.6**	**169.3**	**193.6**	**203.5**
Account payables	4.3	5.1	8.3	27.8	43.2	36.8	38.5	48.5	101.1	54.9	63.2	68.6	74.6
ST int bear debt	4.9	2.1	30.9	87.8	65.2	62.0	29.4	99.0	51.2	24.0	30.5	39.7	39.7
Other current liabs	45.8	6.9	6.8	20.6	21.4	41.1	61.8	47.3	116.8	67.7	75.6	85.2	89.2
Non-current Liabilities	**32.9**	**26.5**	**6.6**	**5.7**	**21.3**	**36.8**	**59.9**	**87.3**	**85.0**	**52.4**	**58.6**	**63.3**	**69.0**
LT payables	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LT int bear debt	27.0	25.3	4.5	0.5	14.0	25.0	45.0	76.8	74.0	42.0	45.4	48.5	48.5
Other LT liabs	4.0	1.2	2.1	5.2	7.3	11.8	14.9	10.5	11.0	10.4	13.2	14.8	20.5
Total liabilities	**87.9**	**40.6**	**52.6**	**141.8**	**151.0**	**176.7**	**189.6**	**282.2**	**354.2**	**199.1**	**227.9**	**256.9**	**272.5**
Paid-in capital	27.3	24.1	24.1	45.1	45.1	45.1	45.1	45.1	45.1	49.0	49.0	49.0	49.0
Capital surplus	29.9	31.6	24.3	84.3	78.8	78.8	84.0	85.5	102.7	177.6	177.6	177.6	177.6
Other comprehensive inc	14.0	0.5	0.1	2.8	5.3	9.6	14.2	3.8	2.5	10.6	0.0	0.0	0.0
Others	(0.0)	(0.0)	(0.0)	(17.5)	(13.4)	(7.9)	(4.7)	(4.6)	(0.6)	(0.6)	0.0	0.0	0.0
Retained earnings	(27.2)	(22.3)	(14.3)	(8.3)	26.7	57.1	97.4	137.4	209.1	301.9	356.2	424.0	508.3
Non-controlling	0.0	0.0	1.3	2.6	3.3	3.3	0.0	0.0	0.0	3.7	11.3	12.0	12.2
Total shareholder equity	**44.0**	**33.9**	**35.5**	**108.9**	**145.7**	**186.0**	**236.0**	**267.2**	**358.8**	**542.2**	**594.1**	**662.6**	**747.1**

Free cashflow analysis

(Wbn)	01	02	03	04	05	06	07	08	09	10	11F	12F	13F
Net profit	**30.4**	**4.8**	**7.2**	**7.0**	**29.6**	**34.8**	**44.4**	**48.9**	**80.5**	**104.7**	**71.5**	**84.9**	**101.4**
Add non-cash expenses	**(31.0)**	**(4.9)**	**0.0**	**9.0**	**5.6**	**22.0**	**8.7**	**11.3**	**25.2**	**36.5**	**27.9**	**28.1**	**26.7**
Depreciation	1.6	1.5	0.0	3.3	7.2	7.7	9.5	9.2	14.5	15.9	16.5	16.2	16.0
Allowance for reserves	2.8	1.0	0.0	2.4	5.4	5.6	7.2	6.9	5.3	8.6	9.2	9.7	10.2
Net FX gains	(0.1)	0.1	0.0	0.8	(0.0)	(0.0)	(0.2)	(17.1)	(0.1)	0.1	0.3	0.3	2.0
Net eq method gains	0.0	0.0	0.0	(1.2)	(1.3)	(0.1)	1.2	0.5	(1.2)	(2.6)	(3.0)	(2.5)	(2.5)
Others	(35.5)	(7.4)	0.0	2.1	(8.9)	7.9	(7.9)	(22.7)	1.9	6.3	3.5	3.0	3.0
Add. Changes in OP asset & liabilities	**3.8**	**(30.3)**	**0.0**	**0.5**	**(11.4)**	**(29.4)**	**(17.8)**	**(80.9)**	**6.3**	**(57.0)**	**(37.0)**	**(45.1)**	**(41.8)**
Investment in WC	(4.5)	(18.7)	23.2	75.9	14.8	36.6	9.6	58.9	53.8	2.0	37.0	45.1	41.8
Others	0.6	49.0	(23.2)	(76.4)	(3.4)	(7.1)	8.3	22.0	(60.2)	55.0	0.0	0.0	0.0
Cash from operation	**3.2**	**(30.4)**	**7.2**	**16.6**	**23.7**	**27.3**	**35.2**	**(20.7)**	**112.1**	**84.2**	**62.4**	**67.9**	**86.3**
Subtract capital expenditure	0.3	1.5	0.0	5.7	19.5	36.7	70.9	57.2	15.1	27.2	45.0	69.5	44.3
Free cash flow	**2.9**	**(31.9)**	**7.2**	**10.9**	**4.2**	**(9.4)**	**(35.7)**	**(77.9)**	**97.0**	**57.0**	**17.4**	**(1.6)**	**42.0**
Dividend	0.0	0.0	0.0	0.0	0.0	4.3	6.6	8.8	8.8	11.2	17.1	17.1	17.1
Net investments	0.0	0.0	0.0	0.0	0.0	0.0	(21.8)	6.3	12.6	7.0	3.5	3.5	3.5
Share issues	23.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	63.1	0.0	0.0	0.0
Increase in debt	(30.9)	(4.4)	7.9	52.9	(9.1)	7.9	(12.6)	101.4	(50.6)	(59.2)	9.9	12.3	0.0
Others	(53.0)	(9.3)	15.4	63.1	0.8	(3.6)	(30.6)	10.7	(28.8)	(21.2)	1.6	(1.2)	2.1
Net cash flow	**48.1**	**(46.8)**	**(0.2)**	**13.9**	**(2.3)**	**0.4**	**(9.0)**	**5.7**	**10.6**	**8.6**	**0.7**	**(6.2)**	**7.2**
Beginning cash	1.8	50.0	3.1	2.8	16.7	14.5	14.9	5.8	11.6	22.2	30.9	31.6	25.3
Ending cash	50.0	3.1	2.8	16.7	14.5	14.9	5.8	11.6	22.2	30.9	31.6	25.3	32.5

Stability Ratios

	01	02	03	04	05	06	07	08	09	10	11F	12F	13F
Current ratio	146.7	312.9	102.3	116.1	140.6	153.1	170.2	155.5	170.5	324.4	310.4	293.1	311.7
Quick ratio	61.9	7.0	6.0	10.6	7.9	6.9	2.7	3.8	4.8	6.5	6.0	4.5	5.1
Inventory holding period (days)	64.9	129.2	228.7	290.4	126.6	128.5	135.8	189.7	196.3	150.6	158.1	158.7	76.5
A/R collection period (days)	107.0	130.1	155.6	194.5	96.8	105.7	119.4	118.6	90.8	76.1	91.1	93.1	44.7
A/P period (days)	40.1	55.1	31.2	43.1	53.2	58.6	53.3	46.4	57.8	62.6	41.9	41.3	42.5
Interest bear debt (Wbn)	31.8	27.4	35.4	88.3	79.2	87.0	74.4	175.8	125.2	66.0	75.9	88.2	88.2
Cash & equivalents (Wbn)	50.0	30.5	5.6	18.7	16.0	14.9	12.6	26.0	76.0	136.3	141.3	132.5	151.8
Net int. bear debt (Wbn)	(18.2)	(3.1)	29.7	69.5	63.2	72.1	61.9	149.8	49.2	(70.2)	(65.4)	(44.3)	(63.6)
Net debt/equity (%)	(41.2)	(9.0)	83.8	63.8	43.4	38.7	26.2	56.1	13.7	(13.0)	(11.0)	(6.7)	(8.5)
Liability/equity (%)	199.6	119.7	148.0	130.2	103.7	95.0	80.4	105.6	98.7	36.7	38.4	38.8	36.5
Interest coverage (X)	(0.5)	(0.1)	10.8	2.2	9.5	10.9	16.3	10.0	12.5	27.1	24.6	24.4	26.2

Valuations and margins

	01	02	03	04	05	06	07	08	09	10	11F	12F	13F
EV/EBITDA (X)	(612.4)	498.3	102.5	156.3	33.9	21.4	19.6	17.3	9.9	8.9	12.5	10.9	9.3
EPS (W)	5,577	1,004	1,495	782	3,284	3,858	4,922	5,423	8,936	10,683	7,293	8,669	10,349
EPS y-y (%)	N/A	(82.0)	48.9	(47.7)	320.2	17.5	27.6	10.2	64.8	19.6	(31.7)	8.9	19.4
PER (X)	26.9	149.4	100.3	191.9	45.7	38.9	30.5	27.7	16.8	14.0	20.6	17.3	14.5
BVPS (W)	14,388	6,598	7,367	15,755	16,168	20,638	26,189	29,649	39,818	57,651	60,626	67,616	76,236
P/BVPS (X)	10.4	22.7	20.4	9.5	9.3	7.3	5.7	5.1	3.8	2.6	2.5	2.2	2.0
Dividend (W)	1,000	1,000	1,000	1,000	1,000	2,000	2,000	1,000	1,250	1,750	1,750	1,750	1,750
Yield (%)	0.7	0.7	0.7	0.7	0.7	1.3	1.3	0.7	0.8	1.2	1.2	1.2	1.2
ROE (%)	N/A	12.4	20.8	9.8	23.2	21.0	21.0	19.4	25.7	23.2	12.6	13.5	14.4
ROA (%)	26.8	4.7	8.9	4.2	10.8	10.5	11.3	10.0	12.8	14.4	9.1	9.8	10.5
GP margin (%)	32.7	33.6	33.0	33.2	36.1	40.6	40.8	39.6	41.9	39.8	34.9	35.2	37.1
OP margin (%)	(5.4)	(0.3)	7.0	3.5	9.1	13.5	13.2	13.2	18.6	18.4	12.7	13.6	14.6
NP margin (%)	54.2	10.5	6.9	5.0	7.9	8.6	10.0	9.5	12.5	13.2	9.3	9.9	10.7
EBITDA margin (%)	(2.3)	3.1	7.0	6.4	11.2	15.6	15.6	15.2	21.2	20.8	15.2	15.8	16.6
ROIC (%)	(7.4)	(0.4)	19.8	8.9	12.0	16.7	15.5	15.7	22.3	25.7	15.1	15.6	16.4
WACC (%)	7.1	7.4	6.2	11.2	9.9	10.3	9.2	8.3	6.5	10.4	7.3	8.1	9.3
ROIC less WACC (%)	(14.5)	(7.9)	13.6	(2.3)	2.1	6.4	6.3	7.4	15.8	15.3	7.8	7.5	7.1

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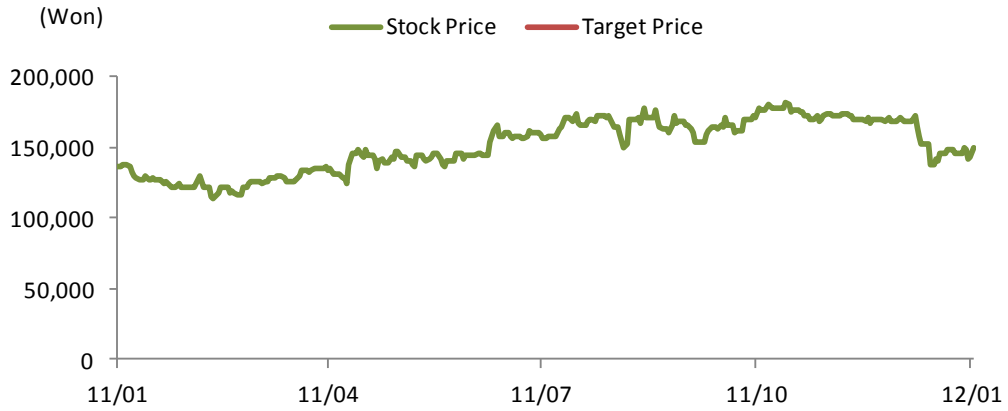
▶ Ratings and target price history in past two years

Green Cross (006280 KS)	
Date	2012-1-9
Ratings	BUY
Target Price	225,000

▶ Target price changes in past two years



▶ Investment period and ratings

Company

BUY	The stock is expected to outperform the market by at least 15%p over the next 12 months.
HOLD	The stock is expected to either outperform or underperform the market by less than 15%p over the next 12 months.
SELL	The stock is expected to underperform the market by at least 15%p over the next 12 months.

Industry

OVERWEIGHT	Industry indicators are expected to outperform the market by at least 5%p over the next 12 months.
NEUTRAL	Industry indicators are expected to be in line with the market within 5%p over the next 12 months.
UNDERWEIGHT	Industry indicators are expected to underperform the market by at least 5%p over the next 12 months.

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