

AnGes, Inc. (4563 JP / TSE Mothers)

October
2019

SUMMARY

AnGes (formerly AnGes MG and renamed in 2017) is a biotech venture company focused on genetic medicines, including gene therapy and oligonucleotide molecules. The company currently has three main projects in the pipeline; 1) HGF (hepatocyte growth factor) plasmid, 2) Oligonucleotide medicine for low back pain caused by disc degeneration, and 3) DNA vaccine for hypertension.

AnGes's core product is "Collatogene®", an HGF plasmid for critical limb ischemia, which is the most severe form of peripheral arterial disease typically caused by diabetes. Recently, in March 2019, Collatogene became the first gene therapy product to receive conditional approval from the Japanese authority (*see the main text for details*). Collatogene was launched by Mitsubishi Tanabe Pharma Corporation, AnGes's alliance partner, in September 2019.

Collatogene also made progress in clinical trials in the US. The company plans to launch the product in the US, where there are a larger number of patients (estimated at over 100,000), within five years.

Given the significant progress made in Collatogene, AnGes is close to becoming profitable, in our view. In addition to making progress in the existing pipeline, AnGes is also actively adding new development pipelines such as genome editing technology. The projects are also expected to contribute to the company's future growth.

PIPELINE SUMMARY

| Project | Indication | Area | Development Stage | | | | | | |
|-----------------------------|--|-----------|--------------------------|---------|----|----|-----|----------|---------|
| | | | Preclinical | P1 | P2 | P3 | NDA | Approval | Market |
| Collatogene - HGF Plasmid | Critical Limb Ischemia | Japan | Completed | | | | | | Ongoing |
| | | USA | New Development plan TBD | | | | | | |
| NF-κB Decoy Oligonucleotide | Low Back Pain due to Disc Degeneration | USA | Completed | Ongoing | | | | | |
| DNA Vaccine | Hypertension | Australia | Completed | Ongoing | | | | | |

(Source: Company)

COMPANY PROFILE

AnGes was founded in 1999 as one of the first university-originated biopharmaceutical venture companies in Japan. The company's business is based on research by Professor Ryuichi Morishita of Osaka University, who discovered that the HGF gene holds revascularization functions and that it is effective in treating the final stages of critical limb ischemia.

AnGes has entered into alliance agreements with major Japanese and global pharmaceutical companies, such as Mitsubishi Tanabe Pharma Corporation (4508 JP) and Shionogi & Co., Ltd. (4507 JP). AnGes has also established an overseas subsidiary in the US in order to expand its global market coverage.

AnGes was listed on the TSE's Mothers section in 2002. As at September 30, AnGes's market capitalization was JPY71.8 bn (USD670 mn) at share price @JPY671.

Koyo Ozeki

Financial
Research

MANAGEMENT

Dr. Ei Yamada (69), President & CEO, is the key person at AnGes, serving as the sole full-time board member since 2001. Professor Ryuichi Morishita of Osaka University, the founder of AnGes, serves as the company's medical advisor.

As of December 31, 2018, the company had 33 full-time employees. The outside directors and R&D staff have extensive experience in drug discovery at major pharmaceutical companies.

SHAREHOLDERS

AnGes's shareholder structure is diversified, with around 85% of shares held by roughly 62,000 individual investors. As of June 2019, the largest shareholder was Shionogi & Co., Ltd. with 1.10%, followed by SBI Securities Co, Ltd. (1.00%) and Daiwa Securities Co., Ltd. (0.89%). Professor Morishita holds 0.65% ownership.

BUSINESS MODEL

AnGes's business is based on three key strategies; 1) engaging in alliances with the major pharmaceutical companies to generate revenue in the form of license fees and milestone payments, 2) increasing the development pipeline in related areas, and 3) engaging in the development and sales of in-licensed products to diversify the business portfolio.

MARKET POSITION

In Japan, the biotech venture industry started to grow in the early 2000s, when the Japanese government began to promote university-based venture businesses. After the so-called "bio bubble" in 2000-2006, the number of new companies decreased and many companies went out of business.

MAJOR LISTED BIOTECH COMPANIES IN JAPAN

| | Security Code | Market cap. (Sep..27.'19) JPY mn | Net profit (FY2018) JPY mn | |
|----|---------------------|-------------------------------------|-------------------------------|--------|
| 1 | Peptidream | 4587 | 645,349 | 2,770 |
| 2 | Takara Bio | 4974 | 283,940 | 3,657 |
| 3 | JCR Pharma | 4552 | 265,533 | 3,715 |
| 4 | SanBio | 4592 | 232,287 | -2,920 |
| 5 | Sosei Heptares | 4565 | 188,113 | -5,977 |
| 6 | GNI Group | 2160 | 81,043 | -200 |
| 7 | AnGes | 4563 | 75,382 | -2,996 |
| 8 | Healios | 4593 | 66,192 | -5,097 |
| 9 | Medicinova | 4875 | 36,568 | -1,598 |
| 10 | Oncolys Bio Pharma | 4588 | 32,331 | -1,233 |
| 11 | Carna Biosciences | 4572 | 20,994 | -1,210 |
| 12 | Gene Techno Science | 4584 | 20,459 | -856 |
| 13 | Nanocarrier | 4571 | 16,774 | -1,808 |
| 14 | OncoTherapy Science | 4564 | 16,214 | -2,934 |
| 15 | SymBio | 4582 | 15,958 | -2,752 |

(Source: Nikkei, Toyo Keizai)

Currently there are 215 biopharmaceutical venture companies in Japan, according to Japan Bioindustry Association (JBA). AnGes is one of the forerunners in the industry, and ranks in the top ten among the 30 listed companies by market capitalization.

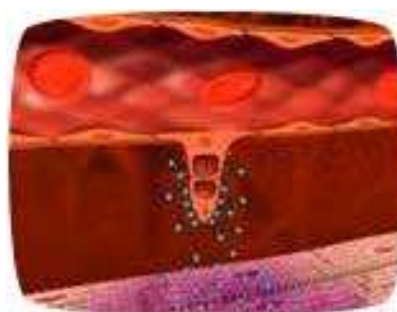
DEVELOPMENT PIPELINE

AnGes's development pipeline currently consists of three main products; 1) Collatogene - HGF plasmid for critical limb ischemia, 2) "NF-κB Decoy Oligonucleotide" for atopic dermatitis and low back pain caused by disc degeneration, and 3) DNA vaccine for hypertension. (*See APPENDIX for details on the development stages of each product.*)

Collatogene: This is AnGes's core project which seeks a radical cure for critical limb ischemia (CLI). CLI is typically caused by diabetes, and is the most severe form of peripheral arterial disease (PAD), where the vascular flow in the limbs is severely constricted.

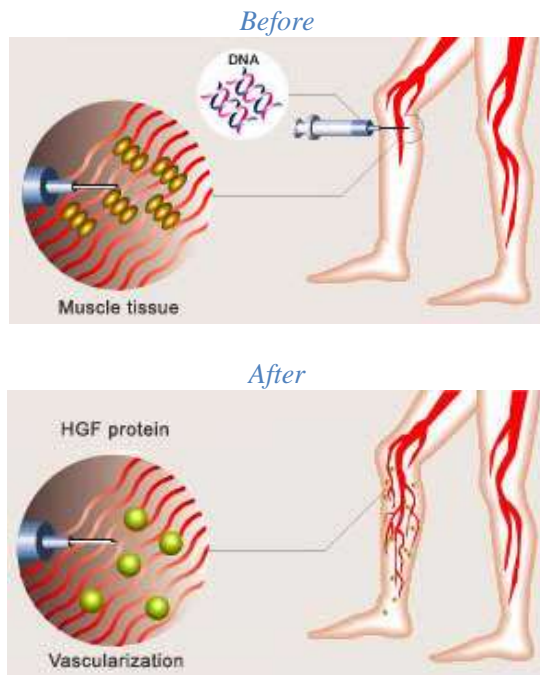
Currently, leg amputation is the main symptomatic treatment for patients who are not able to undergo bypass surgery. The government's official estimate of the number of patients in Japan is around 1,000, but the actual number could be much larger. In the US, it is estimated that more than 100,000 patients undertake leg amputation surgery every year, and many eventually lose their lives.

Collatogene (HGF) has the ability to generate new capillaries and recovers the vascular flow (*see illustration below*), thus effective in treating PAD.



Collatogene is administered by direct injection to the affected areas. Collatogene is expected to effectively cure the symptoms with minimal

pain and damage, and dramatically reduce cases of leg amputation.



Collategene completed Phase III clinical trials in Japan, and filed a new drug application (NDA) in 2018. In March 2019, Collategene received a “conditional, time-limited approval” from the Japanese authority (Ministry of Health, Labor and Welfare).

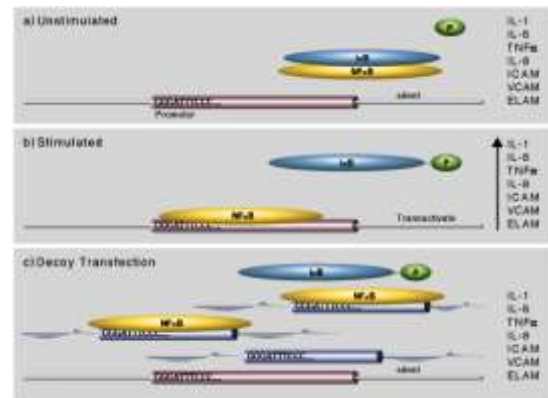
The conditional, time-limited approval is a new system introduced in 2017, under which a new drug is tested through “post-approval evaluation” by the subject group patients.

In Collategene’s case, the time limit is five years (the process could be shorter), following which official marketing approval will be given subject to satisfactory evaluation results.

In September 2019, Collategene obtained the National Health Insurance (NHI) drug price listing: JPY600,360/4mg per injection, which is going to be tested through a subject group of about 60 patients. Following the NHI price listing, Collategene was launched through Mitsubishi Tanabe Pharma, which is also commissioned to conduct a confirmatory study for the post-approval evaluation.

NF-k (kappa) B Decoy Oligonucleotide: AnGes is developing a decoy (an artificially

created nucleic acid that works as a specific inhibitor) for “NF-kB”. The decoy functions as a switch to a gene cluster related to the human body’s immune inflammatory response and inhibits the production of such disease factors.



The project is currently focused on developing a drug in the US for chronic lower back pain disease caused by disc degeneration. The project is at Phase I b clinical trial stage.

DNA therapeutic Vaccine: AnGes is undertaking DNA vaccine projects in new type of gene therapy. DNA vaccines could potentially demonstrate efficacy in two areas, i.e. prevention of infectious diseases and treatment of cancers and lifestyle-related diseases. AnGes is currently making progress in the development of DNA vaccine for hypertension.

GROWTH STRATEGY

In addition to the existing pipeline, AnGes is preparing to develop new drugs based on genetic technologies.

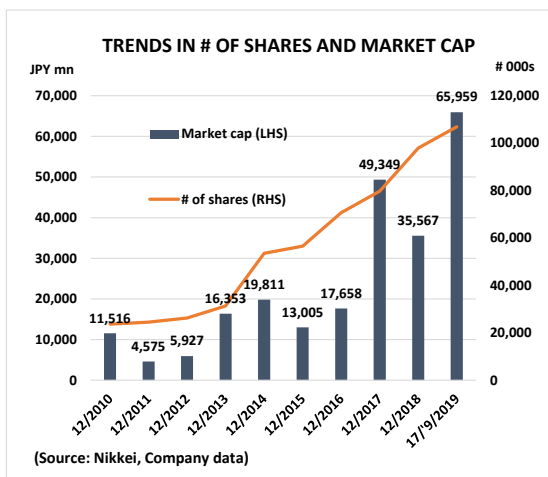
In July 2018, AnGes entered into a capital alliance with MyBiotics Pharma Ltd., an Israeli specialist in human microbiome research and development. Microbiome is the next generation medicine expected to contribute to the aging society by addressing a wide range of diseases and self-medication.

In March 2019, AnGes invested in Emendo Biotherapeutics (Israel-based US biotech company that specializes in genome editing), and engaged in a capital alliance with Barcode Diagnostic (Israeli biotech company that specializes in DNA barcode technology for cancer treatment).

In DNA vaccines, AnGes is working with Canada's Vaccine and Infectious Disease Organization (VIDO-InterVac) to develop antiserum medicine for Ebola hemorrhagic fever (EHF). By adding these projects, AnGes plans to enhance its position as the forerunner of gene biotech.

FINANCIAL POSITION

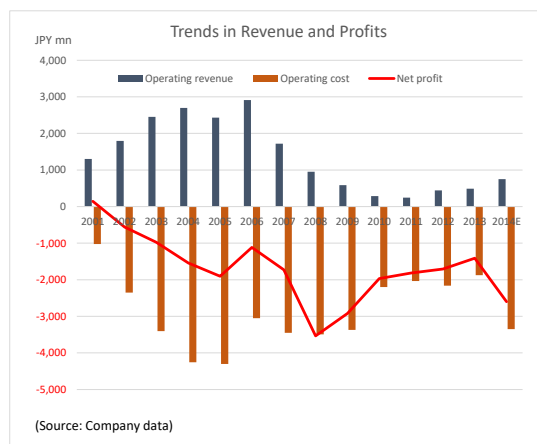
AnGes has successfully funded the projects through equity financing (see Appendix for the details of recent equity financing). As a result of the increased capital base and relatively good stock price performance, the company's market capitalization has grown significantly over the past few years, and the individual shareholder base has further diversified.



Income statement: Until recently, AnGes's revenues consisted of contract fees/ milestone payments and the sales of an in-licensed drug "Naglazyme", developed by a US company Bio Marin Pharmaceutical Inc. for the treatment of an orphan disease, Maroteaux-Lamy syndrome. The sales of Naglazyme had generated annual revenues of around JPY300-350 mn with profit margin of around 50%. However, the contract with Bio Martin expired in the first half of 2019, and therefore AnGes's revenue base will come down from the second half.

Milestone payments for Collatogene will support the revenue base, but operating expenses are to remain at high levels for the time being due to the post-approval evaluation process. AnGes forecasts FY2019 business revenue and operating loss at JPY335 mn and JPY2,800 mn, respectively. The company's royalty income

should be boosted when Collatogene is formally approved and launched.



Balance sheet: AnGes has maintained a sound balance sheet structure with ample liquidity by successfully raising capital. At the end of June 2019, the company's cash in hand was JPY11.3 bn (or 81% of total assets), which should be sufficient to cover most operating expenses for the next three to four years.

Cash flow: Over the last couple of years, AnGes's operating cash outflow has improved to roughly JPY2,500-3,000 mn from JPY5,000 mn in FY2015-16.

The company will be able to finance the outflow from operations for the next three to four years with its current cash position. However, potential new investments or drug developments may require additional financing. The company's financing options should expand, as the official launch of Collatogene approaches.

OUTLOOK

The launch of Collatogene is the key to AnGes's corporate value. Collatogene made a big step forward in 2019 with the conditional approval being awarded and the subsequent partial launch of the product in Japan.

AnGes and Mitsubishi Tanabe Pharma are working together to obtain formal approval within five years. AnGes is expected to turn profitable when Collatogene contributes to both sales and profits following the full-scale launch.

AnGes also plans to launch Collatogene in the US within a similar time frame. This should be

a catalyst for the company's financial performance, in our view. We estimate AnGes's annual revenues to grow to JPY10-20 bn (USD100-200 mn) during the initial stages of the launch in the US, and the company will be able to collect on invested capital in a relatively short period of time.

If Collatogene penetrates in the US market as a standard therapy for CLI, AnGes' royalty income could grow further.

Moreover, revenues from Collatogene could potentially be significant if marketed globally in the future, in light of the large global market size (estimated at USD10 bn).

Success in Collatogene will enable AnGes to make new investments to become a global leader in the gene biotech industry.

APPENDIX

PROJECT PIPELINE

| Project | Indication | Area | Development Stage | | | | | | |
|--|--|-----------|--------------------------|---------|-------------|-----------|------|-----------|-----------|
| | | | Preclinical | Phase I | Phase II | Phase III | NDA | Approval | Market |
| | | | | | | | | | |
| Collatogene – HGF Plasmid (Bperminogene Porplasmid) | Critical Limb Ischemia | Japan | | | | | 2018 | Mar. 2019 | Sep. 2019 |
| | | USA | New development plan TBD | | | | | | |
| NF-κB Decoy Oligonucleotide | Atopic Dermatitis | Japan | | | | * | | | |
| | Low Back Pain due to Disc Degeneration | USA | | P1b | Feb. 2018 – | | | | |
| DNA Vaccine | Hypertension | Australia | | | Apr. 2018 – | | | | |

* The study did not show statistically significant difference between the NF-κB Decoy Oligonucleotide treated group and the placebo group in the primary endpoint.

RECENT EQUITY FINANCING

RECENT EQUITY FINANCING (LAST 3 YEARS)

| Timing | Method | | Underwriter/ Subscriber | Number of new shares | Issue price @ JPY | Amount (JPY mn) |
|---|----------|------------------------|----------------------------|-------------------------|----------------------|--------------------|
| 2016/4 | Warrants | Third party allocation | Mita Securities | 6,436,700 | 235 | 3,072 |
| 2016/8 | Warrants | Third party allocation | Mita Securities | 7,650,000 | 147 | 1,800 |
| 2017/1 | Warrants | Third party allocation | Credit Suisse | 8,000,000 | 280 | 2,365 |
| 2017/9 | Warrants | Third party allocation | Leading Securities | 12,000,000 | 515 | 5,051 |
| 2018/9 | Warrants | Third party allocation | Mita Securities | 16,000,000 | 590 | 10,501 |
| Total | | | (A) | 50,086,700 | 324 | 22,789 |
| Number of outstanding shares in issue / Market cap. @JPY617 | | | (B) | 106,925,061 | 617 | 65,973 |
| | | | (A)/(B) | 46.8% | 52.6% | 34.5% |

(Source: Company data)

FINANCIAL DATA

| INCOME STATEMENT | | | | | | | (JPY mn) | | |
|--|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | Fiscal Year* | 2014 | 2015 | 2016 | 2017 | 2018 | 2019F | 1H 2018 | 1H 2019 |
| Business revenue | | 910 | 430 | 514 | 365 | 610 | 335 | 176 | 173 |
| Net sales of goods | | 309 | 350 | 347 | 365 | 382 | | 176 | 170 |
| Revenues from R&D activities | | 601 | 80 | 167 | 0 | 227 | | | 3 |
| Business expenses | | 3,184 | 4,602 | 5,278 | 3,654 | 3,675 | | 1,381 | 1,882 |
| Cost of sales | | 151 | 180 | 175 | 178 | 188 | | 86 | 84 |
| R&D expenses | | 2,339 | 3,533 | 4,189 | 2,600 | 2,540 | | 804 | 1,130 |
| SG&A | | 694 | 890 | 915 | 876 | 947 | | 491 | 668 |
| Operating profit/loss | | -2,273 | -4,172 | -4,763 | -3,289 | -3,065 | -2,800 | -1,205 | -1,710 |
| Non-operating income | | 65 | 103 | 9 | 10 | 14 | | 13 | 14 |
| (of which subsidy income) | | 61 | 73 | | | 3 | | 3 | |
| Non-operating expense | | 187 | 20 | 93 | 29 | 45 | | 14 | 39 |
| (of which share issuance cost) | | 138 | 19 | 87 | 26 | 42 | | 11 | 35 |
| Recurring profit/loss | | -2,395 | -4,089 | -4,847 | -3,307 | -3,096 | -2,800 | -1,206 | -1,734 |
| Extraordinary profit | | 38 | 58 | 86 | 152 | 93 | | 64 | 8 |
| Extraordinary loss | | | 93 | | 589 | | | | 243 |
| (of which valuation loss on investment securities) | | | 93 | | 477 | | | | 243 |
| Pre-tax profit/loss | | -2,357 | -4,124 | -4,761 | -3,744 | -3,003 | | -1,142 | -1,969 |
| Taxation | | 12 | 19 | 16 | 21 | -6 | | 5 | 5 |
| Net profit/loss | | -2,369 | -4,143 | -4,777 | -3,765 | -2,997 | -2,800 | -1,147 | -1,974 |

* Fiscal year ending December 31

(Source: Company data)

| EBITDA | | | | | | (JPY mn) |
|------------------|---------------|---------------|---------------|---------------|---------------|----------|
| | 2014 | 2015 | 2016 | 2017 | 2018 | |
| Pre-tax profit | -2,357 | -4,124 | -4,761 | -3,744 | -3,003 | |
| Depreciation | 46 | 49 | 67 | 29 | 8 | |
| Interest payment | 0 | 0 | 0 | 0 | 0 | |
| EBITDA | -2,311 | -4,075 | -4,694 | -3,715 | -2,995 | |

(Source: Company data)

| CASH FLOW | | | | | | (JPY mn) |
|-----------------------|---------------|---------------|---------------|---------------|---------------|----------|
| | 2014 | 2015 | 2016 | 2017 | 2018 | |
| Operation | -2,704 | -4,599 | -4,984 | -2,991 | -2,523 | |
| Investment | -52 | -69 | -830 | 227 | -123 | |
| Free cash flow | -2,756 | -4,668 | -5,814 | -2,764 | -2,646 | |
| Financing | 6,427 | 717 | 4,793 | 2,916 | 7,283 | |
| Total | 3,671 | -3,951 | -1,021 | 152 | 4,637 | |

(Source: Company data)

| FINANCIAL RATIOS | | | | | |
|-----------------------|--------|--------|---------|---------|--------|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| ROA | -28.9% | -87.2% | -105.2% | -95.0% | -37.2% |
| ROE | -30.6% | -98.2% | -123.5% | -104.0% | -38.8% |
| Equity / Total assets | 94.5% | 88.8% | 85.2% | 91.3% | 96.1% |

(Source: Company data)

| BALANCE SHEET | | | | | | (JPY mn) |
|---|--------------|--------------|--------------|--------------|--------------|---------------|
| | 2014 | 2015 | 2016 | 2017 | 2018 | 1H 2019 |
| Current assets | | | | | | |
| Cash and deposits | 6,017 | 2,075 | 996 | 1,148 | 5,785 | 11,291 |
| Accounts receivable – trade | 659 | 135 | 298 | 143 | 257 | 127 |
| Merchandise | 91 | 112 | 170 | 129 | 84 | |
| Raw materials and supplies | 266 | 556 | 1,001 | 1,443 | 924 | 706 |
| Advance payments | 522 | 1,209 | 951 | 422 | 366 | 30 |
| Total current assets | 7,594 | 4,243 | 3,619 | 3,434 | 7,542 | 12,410 |
| Fixed assets | | | | | | |
| Property, plant and equipment | 28 | 76 | 76 | 0 | 47 | 51 |
| Intangible fixed assets | 54 | 51 | 55 | | | |
| (of which patent rights) | 52 | 40 | 32 | | | |
| Investments and other assets | 508 | 382 | 789 | 530 | 461 | 1,462 |
| (of which investment securities) | 438 | 315 | 721 | 471 | 401 | 1,400 |
| Total fixed assets | 590 | 509 | 920 | 530 | 509 | 1,512 |
| Total assets | 8,184 | 4,752 | 4,539 | 3,964 | 8,051 | 13,922 |
| Current liabilities | | | | | | |
| Accounts payable – trade | 207 | 247 | 389 | 201 | 113 | 56 |
| Accounts payable – other | 44 | 83 | 62 | 85 | 98 | 71 |
| Accrued expenses | 7 | 23 | 88 | 8 | 16 | 24 |
| Income taxes payable | 42 | 33 | 81 | 12 | 53 | 58 |
| Total current liabilities | 423 | 482 | 631 | 318 | 292 | 219 |
| Fixed liabilities | | | | | | |
| Asset retirement obligations | 15 | 22 | 23 | 23 | 23 | 24 |
| Total fixed liabilities | 26 | 49 | 39 | 24 | 25 | 26 |
| Total liabilities | 449 | 531 | 670 | 342 | 316 | 245 |
| Net assets | | | | | | |
| Paid-in capital | 14,847 | 15,215 | 17,651 | 5,658 | 9,396 | 13,275 |
| Capital surplus | 13,158 | 13,526 | 15,962 | 1,473 | 5,210 | 9,089 |
| Retained earnings | -20,428 | -24,571 | -29,348 | -3,685 | -6,681 | -8,655 |
| Total shareholders equity | 7,577 | 4,170 | 4,265 | 3,447 | 7,925 | 13,709 |
| Accumulated other comprehensive income | 48 | 0 | -405 | -75 | -245 | -113 |
| (of which valuation difference on securities) | 17 | -30 | -417 | -81 | -248 | -111 |
| Share acquisition rights | 109 | 51 | 9 | 250 | 54 | 81 |
| Total net assets | 7,734 | 4,221 | 3,869 | 3,621 | 7,734 | 13,677 |
| Total liabilities and net assets | 8,184 | 4,752 | 4,539 | 3,964 | 8,051 | 13,922 |

(Source: Company data)

DISCLAIMER

This information has been provided for informational purposes only and should not be used or construed as a solicitation, an offer to sell, or an offer to buy any security.