

FEATURE

South Korea's rapid-growth tech ecosystem turns to AI and batteries

By Edison Fu and Maija Palmer

At the beginning of October, Doosan Robotics, an eight-year-old company that makes “co-bots” that can work alongside humans, wowed investors with a stock market debut that raised \$310m and valued the company at more than \$1.25bn.

It was Korea's largest IPO since battery maker LG Energy Solution listed in January 2022, and paves the way for several other technology companies to follow suit with listings. While the technology markets in Europe and the US are just starting

to open up again after a long lull, South Korea is already moving ahead at pace.

It is little wonder — Korea has one of the fastest-growing ecosystems in the world, says Alberto Onetti, chairman of management consulting firm Mind the Bridge.

“10 years ago, it was simply non-existent – now it has the size of countries like Germany and France,” he says.

The country has 1,214 scaleup-sized companies, a 35% increase from 2020. Capital investments more than doubled over the same period reaching the cumulative volume of \$48.2bn, according to Onetti's calculations.

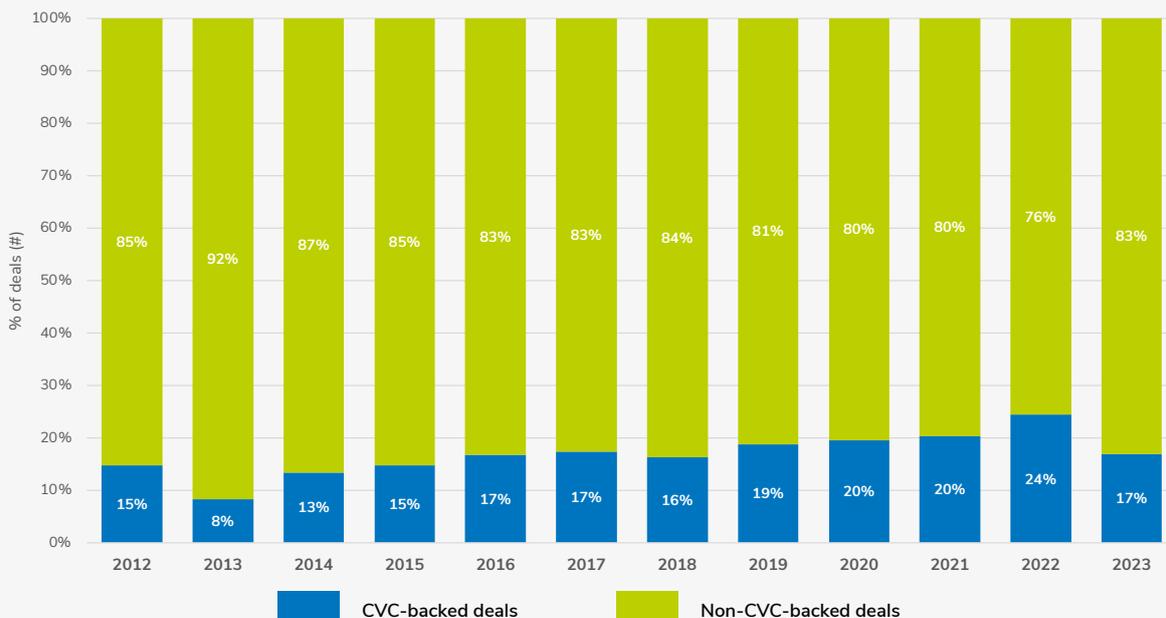
Shift from life sciences to AI

The Korean startup landscape has undergone a big transformation over the past decade, says Junsung Bae, executive director of Lotte Ventures, the investment arm of conglomerate Lotte Group, whose businesses span everything from confectionary to hotels and chemicals. “Initially, there was a strong emphasis on life sciences startups, which gained considerable attention during their nascent stages,” he says.

[cont. >](#)

DASHBOARD

Proportion (%) of corporate vs non-corporate backed VC deals (#) in South Korea 2012–23YTD



Source: PitchBook

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But now there has been a shift toward startups dedicated to innovative drug development, artificial intelligence (AI) and secondary batteries.

Lotte Ventures is one of South Korea's most prolific investors. It started in 2016 as an accelerator programme and then developed into a full investment unit, having now taken stakes in more than 250 companies. Bae says his investment team is now prioritising startups in biotech, healthcare and urban air mobility. Some of its notable portfolio companies include Virnect, an industrial extended reality company, gaming developer Haegin, and drone startup Pablo Air.

It's also looking beyond Korea's borders, considering startups in retail, biotech and secondary batteries from abroad.

Onetti say that AI and its industrial applications are particularly prominent in the Korean startup ecosystem, with key sectors like mobile, healthcare and manufacturing having substantial deployments.

Korean artificial intelligence company Pulse9, for example, recently launched a virtual avatar, powered by deepfake technology, called Zaein, which looks like a real woman and can sing and advertise clothes.

Lotte Ventures, meanwhile, has invested in a similar startup, called 4by4, which has created a virtual live commerce influencer called Lucy. Not only is there some collaboration between the startup and Lotte business units — the character is used for sales at Lotte Home Shopping — the business is also planning a stock market listing.



The arrival of generative AI is giving South Korea's robotics companies a new boost. Doosan Robotics, for example, is partnering with Microsoft to see if the GPT language model can be combined with robots to create machines with the ability to understand voice commands and context.

Lotte Ventures' portfolio also includes AniAI, which specialises in automated hamburger preparation and food quality control. Its robot, Alpha Grill, cooks about 200 burger patties an hour, through a vision sensor.

The rise of the metaverse and gaming technologies have been on the rise due to Korea's dominant position in esports. Nonetheless, the evolution of the metaverse is uncertain, as

Kakao and Com2Us have recently announced staff reductions in their metaverse subsidiaries.

VC deals in Korea have come down from the extreme highs of 2021 and 2022. But the amount of capital invested in startups is still higher in 2023 than it was in 2020, despite the year not being quite over yet. The number of deals is smaller, implying that we are seeing investors placing bigger bets on emerging companies, in line with Onetti's findings that the number of scaleup companies is rapidly growing.



A new wall of CVC money

One of the factors driving startup growth in Korea is the emergence of many new corporate venture units following a regulatory change. At the end of 2021, a law prohibiting Korean conglomerates, or chaebols, from establishing financial firms, was lifted, setting the scene for many more CVC units to be set up.

Although the law change only affects several conglomerates that have holding companies, it has triggered many corporations to establish their own investment arms. At least 20 to 30 CVCs have been created by financial companies, mid-sized companies and unicorn startups in the past several years and some 32% of the country's 76 industrial conglomerates now have a CVC arm.

While many of the large, global South Korean companies like Samsung and LG have had corporate venture units for several years (many of them, like Samsung and LG, based in Silicon Valley) but now much smaller companies are investing.

The Pinkfong Company, a media group that created viral hit song Baby Shark, for example, has become an investor in several younger media companies.

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Xplor Investment, founded in 2022, is another of this new crop of CVC units formed after the regulatory change. The unit is the investment arm of construction firm GS Engineering & Construction and seeks startups in property and construction technologies, aligning with the parent company's smart city and sustainability focus. It is also looking at technologies addressing the problems of an ageing population.

Xplor is an example of the professionalisation that is coming in as the number of CVC units grows. Jong Hoon Lee, CEO, says Xplor Investment aims to operate like an independent VC firm, investing not just in startups closely aligned with the parent corporation but also prioritising financial returns.

"If CVC works too strategically, it often has difficulties in terms of performance and securing manpower," says Lee. "To be a successful CVC, one must first be an excellent VC."

More money coming into the system

In October, the CVC Committee was established, representing a consortium of Korean CVC firms. The committee consists of 53 venture capital companies, including investment arms of prominent corporations like GS, CJ and POSCO. The primary role of the CVC Committee is to act as a vital communication bridge between the CVC industry and various government bodies in South Korea, including investment and antitrust authorities. It is also expected to spearhead CVC policy initiatives in the region.

In addition, the South Korean government has outlined its intentions to amend relevant legislation with the aim

of boosting the CVC sector's contribution to the Korean venture ecosystem to surpass 30% by 2027. These plans involve streamlining the operations of the 9 trn KRW Korea Fund of Funds to make it more CVC-friendly, alongside the development of new fund programmes tailored to support CVC initiatives.

At the end of August the Korean government announced plans for a Krw 2trn Startup Korea Fund, which will invest in deeptech startups in areas such as such as artificial intelligence and semiconductors.

Startup success stories

The emergence of several high-profile unicorns has driven interest among large Korean corporates in the startup ecosystem

Korean startups that have developed into businesses valued at more than \$1bn include e-commerce company Coupang, entertainment and gaming business Bluehole, media company Yello Mobile, smartphone app developer Woowa Brothers, and cosmetics and pharmaceutical maker L&P Cosmetic.

Many of these companies are themselves becoming investors. Krafton, the parent company of Bluehole, recently established a gaming incubator in India.

Immediately after the IPO of Doosan Robotics, meanwhile, CEO William Ryu was already talking about using part of the money raised for mergers and acquisitions. The latest crop of tech success stories is wasting no time in seeding the ground for the next crop of Korean startups to grow. ●



Doosan Robotics

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Alberto Onetti

Chairman
Mind the Bridge



10 years ago, [Korea's tech ecosystem] was simply non-existent – now it has the size of countries like Germany and France.

Jong Hoon Lee

CEO
Xplor Investment



If CVC works too strategically, it often has difficulties in terms of performance and securing manpower. To be a successful CVC, one must first be an excellent VC.

Junsung Bae

Executive director
Lotte Ventures



There has been a noticeable shift towards startups dedicated to innovative drug development. More recently, the spotlight has turned to startups in the realms of artificial intelligence and secondary batteries.



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Anigma

Founded: 2022
Based: Daejeon, South Korea
Funding to date: N/A

Anigma is a platform that uses artificial intelligence technology to edit faces in videos. The company's technology provides three-dimensional face editing interface. It generates a natural mouth shape when dubbing videos in another language, creating a synchronised audio-visual experience.

The startup was founded by chief technology officer JungJin Park and chief executive Kyungmin Cho in 2022. Cho previously did a research internship with Nvidia before founding the startup. Park was an animation engineer at Naver Corp and Archipin.

In July 2023 Anigma completed a seed round with the funding size left undisclosed. Anigma has one venture capital investor, Kaist Venture Investment Holdings, a Seoul-headquartered firm that invests in healthcare and technology startups.



Aniai

Founded: 2020
Based: Seoul, South Korea
Funding to date: \$3m

Aniai develops food service robots which handle hamburger patties and steak using technology dubbed Alpha Grill. The robots increase output and lower operating costs by cooking up to eight patties in under a minute.

Alpha Grill cooks a maximum of 200 burger patties an hour based on preset temperature and thickness. The robot can also control the taste and quality of the patty based on a vision sensor which provides details of the meat.

Aniai was founded by chief executive Geonpil Hwang, engineer Joochul Chang and Sojun Kim in 2020. Hwang was accepted onto Amazon Web Services' robotics accelerator programme. He also co-founded the portable brain imaging device developer Obelab in 2013.

The startup raised \$3m in a seed round in 2023. Capstone Partners and Lotte Ventures participated.



Banf

Founded: 2020
Based: Seoul, South Korea
Funding to date: \$6m

Banf builds real-time lorry tyre direct sensing technology that monitors tyre conditions while vehicles are in motion. The company's hardware and software system, dubbed iSensor System, provides information including tyre data, tyre wear, wheel alignment and fuel efficiency.

Adam Sunghan Yoo founded Banf in 2020 and now serves as the startup's chief executive. He has a Masters from Seoul National University in Electrical Engineering and Computer Sciences.

Since its launch Banf has raised close to \$6m in funding. It raised \$5m in a pre-series A round in June this year. Investors include venture capital firms Daedeok Venture Partners, L&S Venture Capital and accelerator Gentium Partners. The startup is at an advanced pilot stage with the participation of tier-1 car parts companies.



BiomATZ

Founded: 2022
Based: Seoul, South Korea
Funding to date: \$1.54m

Biotechnology company BiomATZ aims to improve the gut microbiome. It has developed a platform designed to produce a cooperative group of microorganisms. Its bank of intestinal microorganism strains allows scientists to obtain an optimal functional strain combination.

Sungki Kim, chief technology officer, and chief executive Yongkyu Kim founded BiomATZ in 2022. Yongkyu Kim previously served two years as a principal investigator at Korea Institute of Science and Technology. Sungki Kim worked for CJ CheilJedang for 13 years as a senior research scientist.

BiomATZ raised \$1.54m in a seed funding round in June 2023. Investors include venture capital firms Gyeongnam Venture Investment and Korea Investment Partners. Korean corporations have also participated in the funding, such as pharmaceutical corporation Daewoong Pharmaceutical and pharmaceutical preparation manufacturing company Kolmar Korea.



Daan Biotherapeutics

Founded: 2020
Based: Seoul, South Korea
Funding to date: \$4.1M

Daan Biotherapeutics develops an integrated immune oncology drug research platform intended to find various treatments and novel drugs for lung cancer therapy.

Daan Biotherapeutics was launched by oncology expert Kyoung-Ho Pyo and chief executive Byoung Chul Cho in 2020. Cho is a medical oncologist and professor in the division of medical oncology at Yonsei Cancer Center at Yonsei University College of Medicine. Cho is an expert in translational oncology.

The startup has raised \$4.1m. Its last funding round was in 2022 when it raised \$3.7m in a seed round. Venture capital firm Aju Ib Investment and NS Investment, the corporate venture subsidiary of South Korea-based pharmaceutical company Dong-A ST, are investors. Wealth management company Time Folio Asset Management also provided funding.



Dogu

Founded: 2017
Based: Seoul, South Korea
Funding to date: N/A

Dogu creates robots for security purposes. They are designed to secure areas such as customer homes, workspaces, hospitals and other public places.

It was founded by chief executive Jinhyo Kim in 2017. Dogu's team consists of around 50 individuals. Kim acquired a doctorate at Yonsei University in Intergrated Technology and also spent nearly two years as a researcher at LG Display, the sister company of South Korean conglomerate LG Corp.

The startup's total funding has been left undisclosed but it recently raised funds in a series A round. Investment was provided by Samik Mats Ventures, a corporate venture subsidiary of Samick THK, a Korean manufacturer of industrial machines. Previous investors include content delivery systems company Humax and venture capital firms Shinhan Capital and KDB Capital.



Genopeaks Therapeutics

Founded: 2020

Based: Seoul, South Korea

Funding to date: \$2.1m

Genopeaks is a Seoul-based liquid biopsy genome analysis company that offers precision medicine to treat cancer. The company combines a mutation amplification technique with a net generation sequencing platform, which enables professionals to detect cancer early and provide customised care through biopsy technology.

Chinkoo Jung, the startup's chief executive, founded the company in 2020. The team consists of seven individuals, including data scientist Minho Jeong and research scientist Seulgi Joo.

Genopeaks is valued at \$2.1m. It completed a pre-series round in 2022 worth \$1.8m. The lead investor in this round included impact investment firm HG Initiative. The startup's previous investors include JB Investment, the corporate venture subsidiary of JB Financial Group.



Hydrochem

Founded: 2021

Based: Kangwon-do, South Korea

Funding to date: N/A

Hydrochem is a developer of a safety system that provides greater safety at hydrogen charging stations, semiconductor lines and power plants. The technology detects and eliminates hydrogen leaks, reducing the risk of explosions.

Based in Kangwon-do, the startup was founded in 2021 by Soon-Seop Shim, who serves as Hydrochem's CEO alongside four team members. He has a bachelor's degree in environmental engineering from Kanto Gakuin University.

The company's funding to date has been left undisclosed, but it raised \$204,000 in a seed round. Investors in Hydrochem include venture firm Sopoong as well as incubators Tech Incubator Program for Startups and Company X. In addition, Innovate UK provided a funding grant.



Lynk Solutech

Founded: 2020

Based: Seoul, South Korea

Funding to date: \$80k

Lynk Solutech produces nano oil film coating that is designed to solve surgical complications caused by the adhesion of unwanted bio substances, blood clots and bacteria. The medical device coating technology benefits both patients and healthcare providers by enhancing the safety and precision of surgeries.

The startup was founded in 2020 and is now headed by Yeontaek Lee, chief executive. Lee previously served as a research student at Korea Institute of Science and Technology and also acquired a doctorate in electrical and electronic engineering at Yonsei University.

Lynk Solutech has raised close to \$800,000. Its most recent round was in 2022 when it raised \$767,000 in a seed round. The company's investors include Yonsei Technology Holdings, a venture capital fund managed by Yonsei University, and Dayli Partners, a bio-healthcare venture capital firm.



Medithings

Founded: 2020

Based: Gyeonggi-do, South Korea

Funding to date: N/A

Medithings has manufactured a wearable bladder monitoring device that provides noninvasive methods to measure bladder volumes. It is intended for individuals with neurological lower urinary tract dysfunctions. The company's technology is designed for people over 18 years old and for patients or families of patients who need information on urinary volume, to predict the time to empty the bladder through a catheter.

Medithings was founded by chief executive Aram Kim in 2020. Kim is a professor and urological surgeon at Konkuk University Hospital. His experience in urology pushed him to find a solution to improve the lives of patients with bladder incontinence issues.

In 2022 the startup raised an undisclosed seed round from SparkLabs Group, a US network of startup accelerators and venture capital funds. Medithings total funding has been left undisclosed.



Stress Solution

Founded: 2022

Based: Daejeon, South Korea

Funding to date: N/A

Wellness company Stress Solution produces personalised sound that it claims manages and induces balance in the autonomic nervous system. The wearbale technology, dubbed Healing Bit, can detect stress in real time and provides feedback to predict when the user is likely to become stressed. Korea's suicide rate, attributable to its high-stress society, is among the highest in the world.

Founded in 2022, Stress Solution has a team of 17 employees and is led by chief executive Bae Ik-Ryeol.

Stress Solution's total funding is undisclosed but the startup raised \$386,000 in a seed round. The company has two notable investors: English Ventures and the Korea Investment Accelerator.



Style AI

Founded: 2020

Based: Seoul, South Korea

Funding to date: N/A

Style AI (Fashionade) is a platform that uses AI-based fashion design software. The designs allow customers to focus on creativity and explore their design capabilities. The software creates models varying in age, ethnicity and aesthetic.

The Seoul-based startup was founded in 2020 and is now run by its chief executive Hajeong Baek. Baek acquired a masters in information management at Korea Advanced Institute of Science and Technology and also a bachelors in business administration at Sungkyunkwan University.

Style AI's total funding has not been disclosed, but in May 2023 the company raised \$337,000 in a seed round with investors including Hanyang University Technology Holdings and Tech Incubator Program for Startups.

Deal size and valuations soar in South Korea's tech sector

Economic growth and innovation tend to go hand and hand and South Korea is no exception. The country has grown an increasingly attractive innovation scene for VC investors, especially in recent years. This is evidenced by the exponential growth of VC-backed funding rounds in South Korea-based businesses – rising over fourfold from 281 rounds in 2017 up to 1,482 in 2021 and 1,355 in 2022.

This exponential growth was even more pronounced in the total estimated dollar value of those investment rounds, which rose 18 times from \$428m in 2017 to \$7.72bn in 2021 and \$7.12bn in 2022.

Such an overshoot was almost inevitably bound for a correction, especially with microeconomic headwinds. So far this year, the levels of both deal count and dollar value have halved versus 2022, with 624 VC-backed rounds at an estimated value of \$3.11bn.

The boom in VC deals in recent years was also reflected in the median post-money valuations and median deal size in Korea. The median deal size more than doubled from \$1.64m in 2017

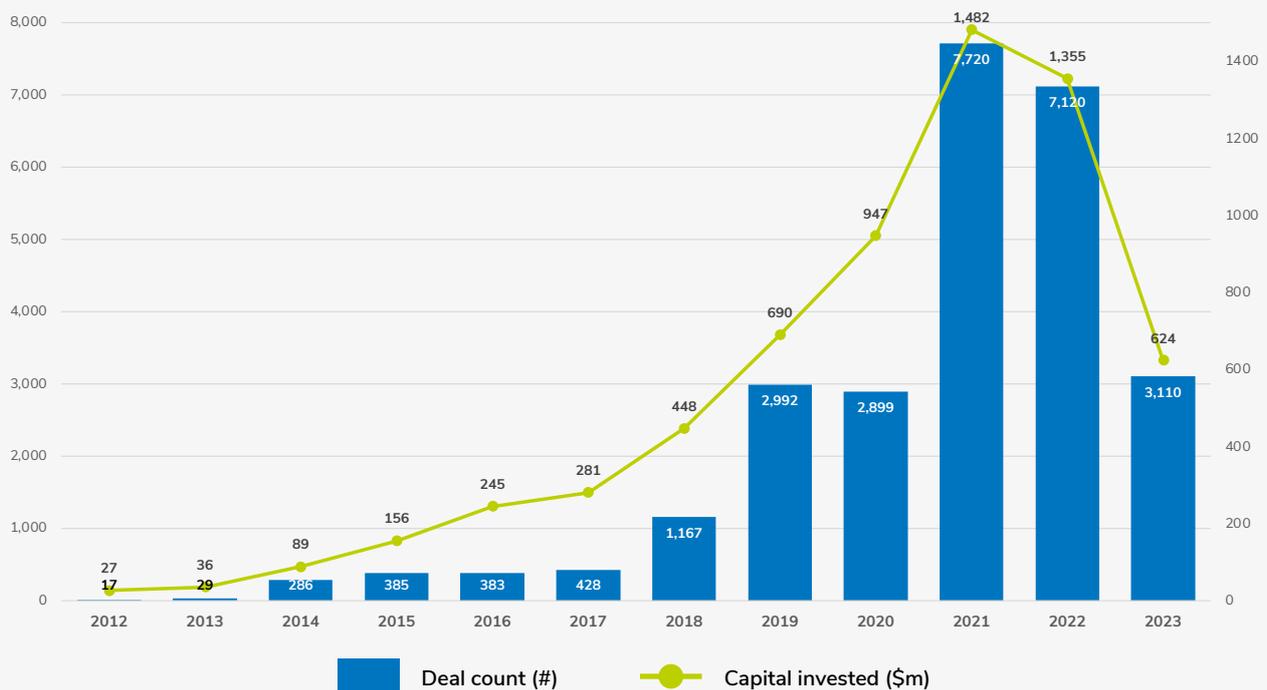


to \$4.22m in 2021. The effect was even more pronounced in post-money valuation terms, with median valuations having grown from \$4.53m in 2017 to \$74.9m in 2021. The median valuation in 2021 was 16.5 times what it had been back in 2017.

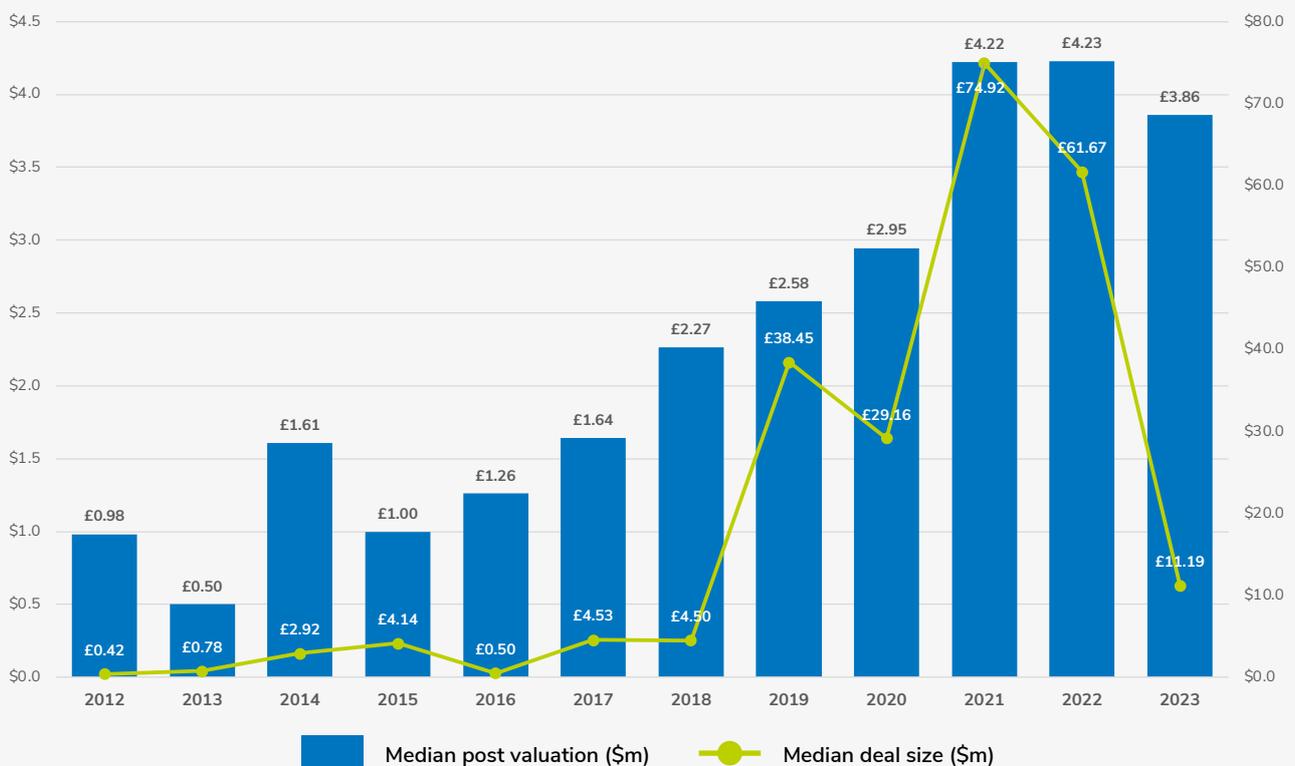
Most VC investments still in early stage

South Korea has still a relatively young VC ecosystem. Historically, the majority of VC deals, as reported by PitchBook, come from the early, seed and pre-seed stages. It has only been over the past three or so years that we have seen the relative share of later stage deals start hovering around 30%.

VC-backed deals in South Korea 2012-23



VC-backed deals in South Korea - median deal size & median post valuation (\$m)



Source: PitchBook

As for the sector-wise distribution, historically roughly around half of deals have been from the IT and healthcare sectors, with another quarter or so of the total being business-to-consumer enterprises.

Active local corporates

Most corporate investors in South Korea’s startup ecosystem are domestic investors.

The number of corporate-backed rounds has increased in recent years along with the boom of VC rounds. But the proportion of corporate-backed rounds has remained relatively stable, fluctuating between 15% and 20% of all VC deals for much of the past decade.

Top corporate-backed deals

Top VC investment rounds in South Korean startups in the past few years have been in a range of sectors, from payment tech and cloud computing to agtech, biotech and food delivery.

Payment tech company Toss raised \$405m in a series G round led by Tonic Private Equity, reportedly putting the company’s pre-money valuation at \$6.6bn. SC Ventures, the venturing arm of Standard Chartered participated in the round, among other investors. The funds will be used to invest in digital lending and online payment service for individuals and local merchants. Toss runs a peer-to-peer payment application designed to simplify payment process.

Cloud service provider Megazone Cloud raised KRW190bn (\$170m) in a series B round that included corporates such as Samsung Securities, Salesforce (via Salesforce Ventures) and KT Corporation (though KT investments). The company’s

pre-money valuation stood reportedly at KRW410bn (\$358m). Megazone Cloud provides integrated cloud consulting and implementation service intended to help companies with cloud transition. It specialises in Amazon Web Services (AWS) cloud and its offerings include architectural consulting, deployment and managed services, implementation, and operation.

Biotech developer Altos Biologics raised estimated KRW160bn (\$146m) in a series A funding round, featuring pharmaceutical company Hanlim Pharmaceuticals. Altos develops human hyaluronidase technology. Hyaluronidase is an enzyme making tissues more permeable and useful in facilitating the management of injectable medications.

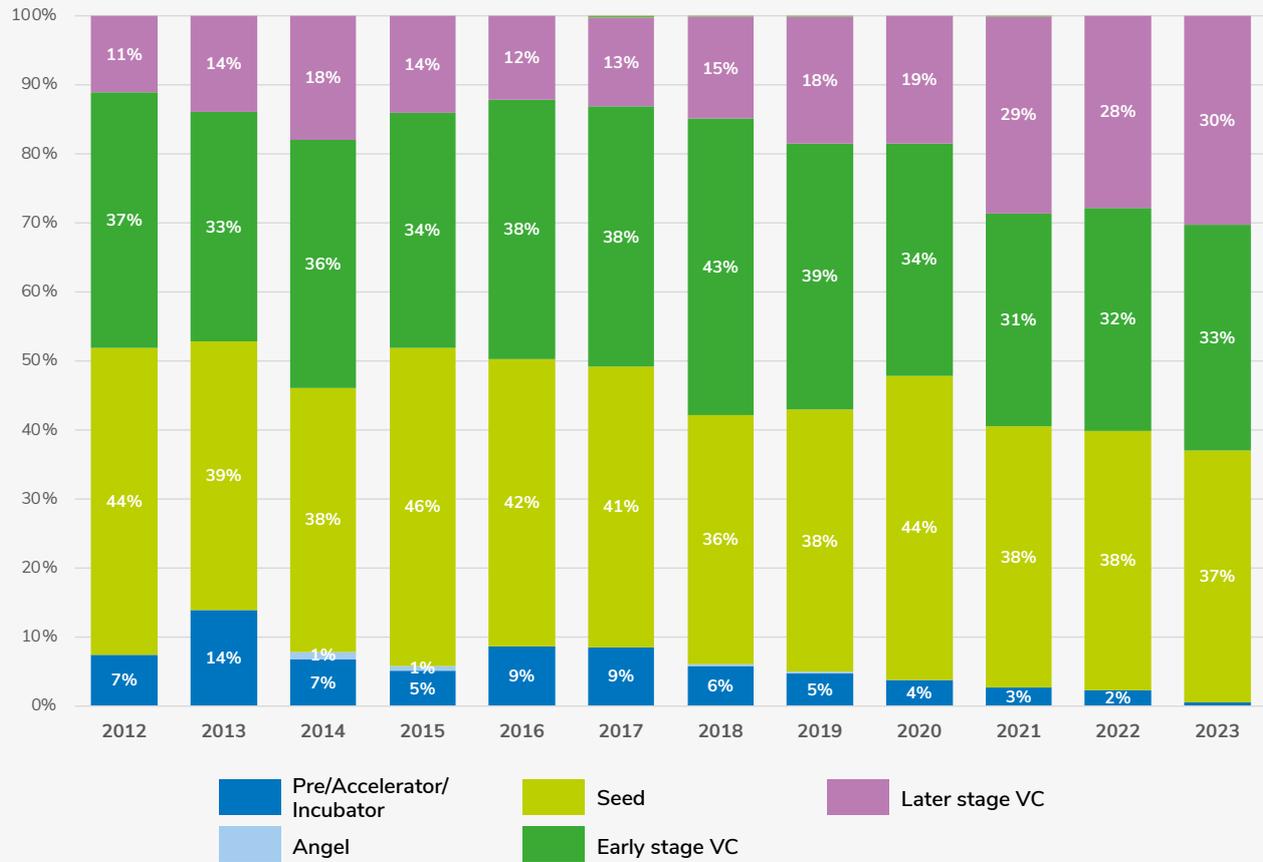
Agtech cloud platform developer Green Labs raised \$140m in a Series C round led by BRV Capital Management, which also included SK Square, the venturing arm of SK Telecom. The transaction reportedly stood at a pre-money valuation at \$700m. Green Labs has developed a cloud-based platform designed to create a smart farm management system.

Food delivery service provider Barogo raised KRW150bn (\$126m) in a Series C round, which featured CJ Investments, the corporate venturing arm of conglomerate CJ Group as well as retail shopping portal 11street. The transaction put the company’s pre-money valuation reportedly at KRW1 trillion (\$850m). KRW10bn was originally raised in the form of convertible debt and subsequently converted to series C equity.

Exits

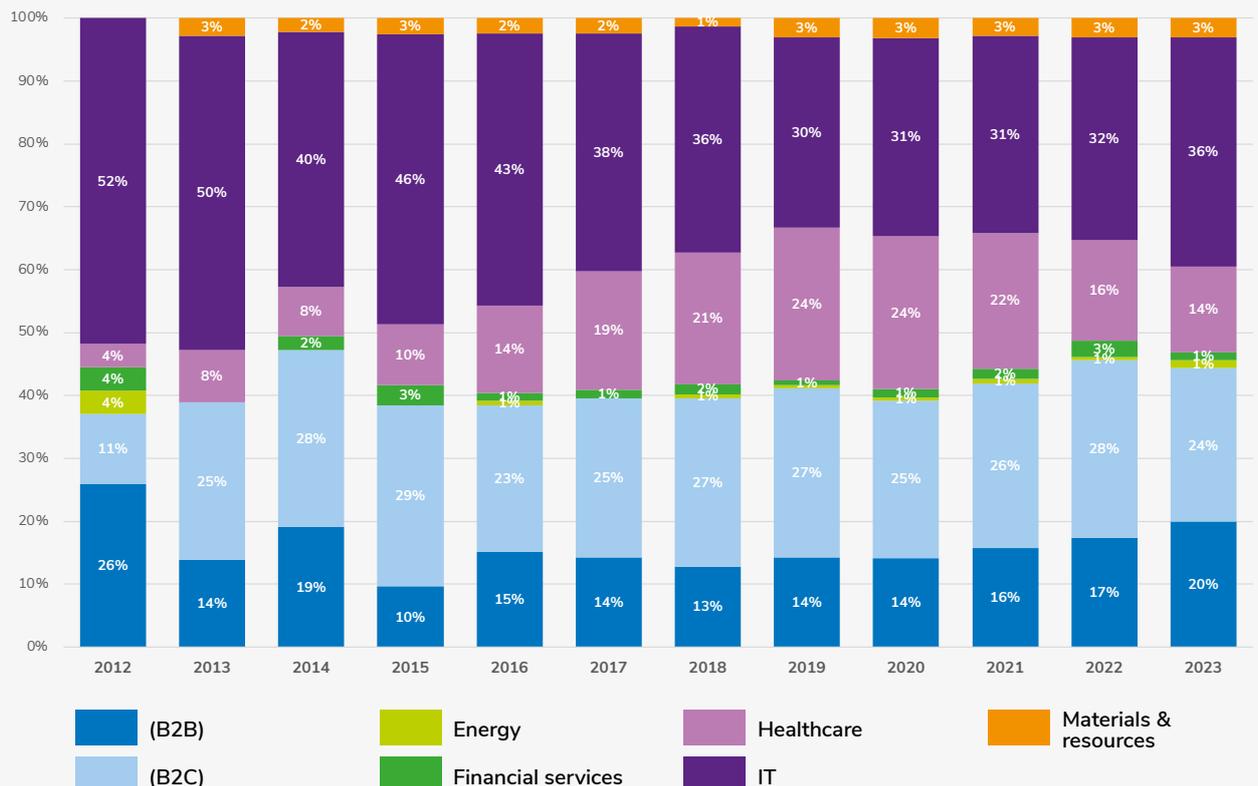
South Korea has seen a decent number of exits for VC-backed local companies over the past decade, with peaks between 2021 and 2022.

South Korea VC deals by stage (%) 2012-23



Source: PitchBook

South Korea VC deals by sector (%) 2012-23



Source: PitchBook

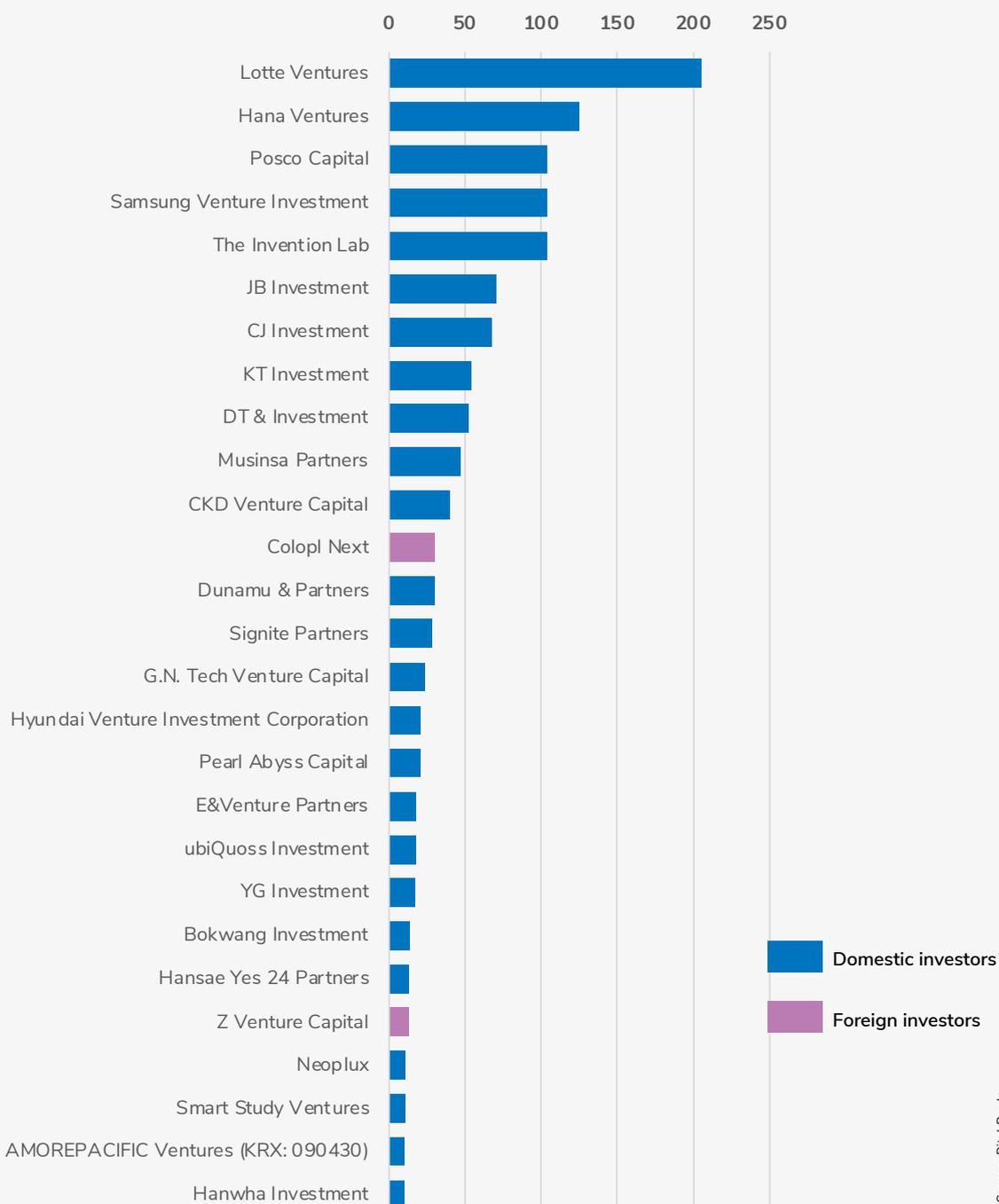
VC-backed companies have been relying increasingly less on IPOs as an exit route compared with six to seven years ago when more than 50% of exits came from public offerings. In recent years, from 2021 onwards, it has been M&A transactions that have accounted for between 50% and 60% of the exits.

Social entertainment platform Hyperconnect was acquired by Match Group for \$1.75bn in 2021. The acquisition provided previous backers like SoftBank (via its SoftBank Ventures Asia unit) with an exit. Hyperconnect has developed a cloud-based mobile communication and social entertainment platform designed to connect people through shared interests.

Another live streaming company, dubbed Grip, was bought by KaKao for KRW180bn (\$152m) in 2021, giving an exit to Neoplux, the venturing arm of industrial manufacturer Doosan Group. Grip has developed a live-streaming e-commerce platform designed to match fashion products with influencers.

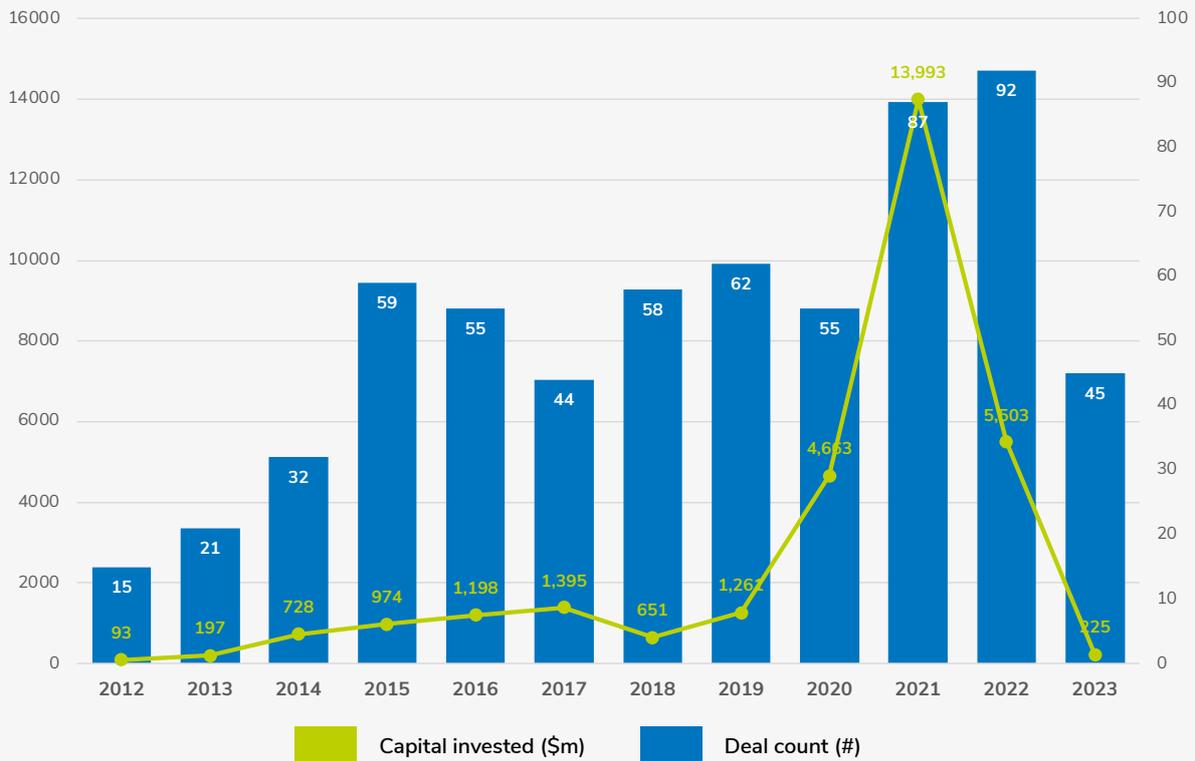
Mobile marketing company Mobidays went public through a reverse merger in 2022, acquiring Hana Financial Seventeen for KRW300bn (\$237m), resulting in a combined entity trading on the Korea Stock Exchange. The transaction gave an exit to Colopl Next, the venturing arm of Japanese corporation Colopl.

Top corporate investors in South Korea 2012-23 (deal count #)



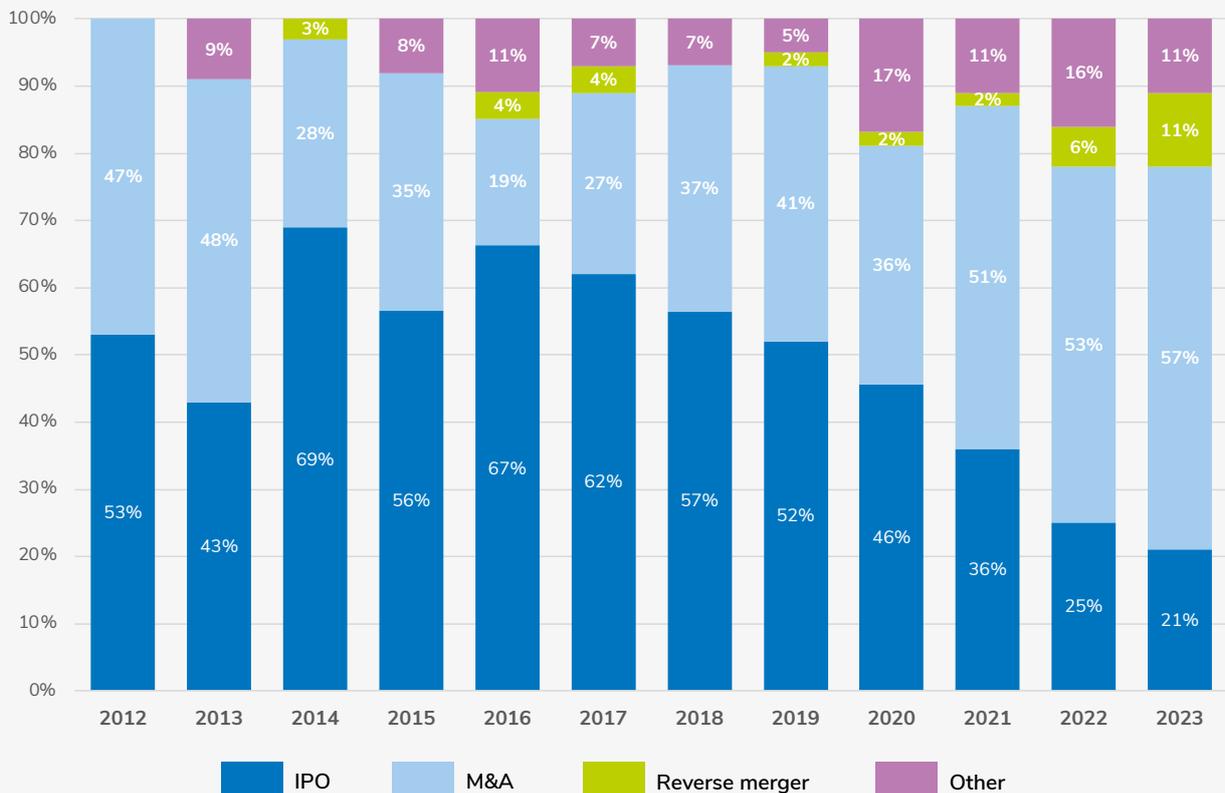
Source: PitchBook

Exits from VC-backed companies in South Korea 2012-23



Source: PitchBook

South Korea VC-backed exits by type (%) 2012-2023



Source: PitchBook

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