Tesi

Deep Tech Study Finland

2024

Foreword

This third edition of Tesi's deep tech study builds on our initiative started in 2022, following the realization of the sector's critical role in fostering high-value employment and supporting environmental and societal impact goals. Since our first report, the importance of deep tech innovation has only intensified, particularly as geopolitical developments bring certain strategic technologies to the forefront.

In last year's edition, we highlighted a challenging financing environment for deep tech companies in Finland amid a global downturn in venture capital funding. Thankfully, this trend now appears to be gradually shifting towards a cautiously optimistic outlook, with investment volumes rebounding from 2023. Significantly, the sector's economic impact has also reached a milestone: Finnish deep tech companies collectively surpassed €1 billion in revenue for the first time.

In this edition, we introduced a comprehensive questionnaire targeting companies within the ecosystem. This approach successfully broadened the scope of insights gathered, enhancing our understanding of key areas such as talent attraction, growth bottlenecks, and funding needs. We extend our sincere thanks to all who contributed to this report, with special acknowledgment to our VC co-authors: Voima Ventures, Lifeline Ventures, Butterfly Ventures and Maki.vc, as well as to our collaborators VTT and the Finnish Startup Community.

Tesi remains a dedicated supporter of the Finnish deep tech ecosystem, investing in funds and companies across various stages of their growth cycle. Our findings underscore a funding gap at the later stages of growth and scaling, which we are addressing through our new investment strategy. This approach now supports deep tech companies throughout their entire lifecycle.

In Collaboration with:

Voima Ventures · LIFELINE VENTURES · Butterfly · MAKI.VC · VTT · Finnish Startup Community

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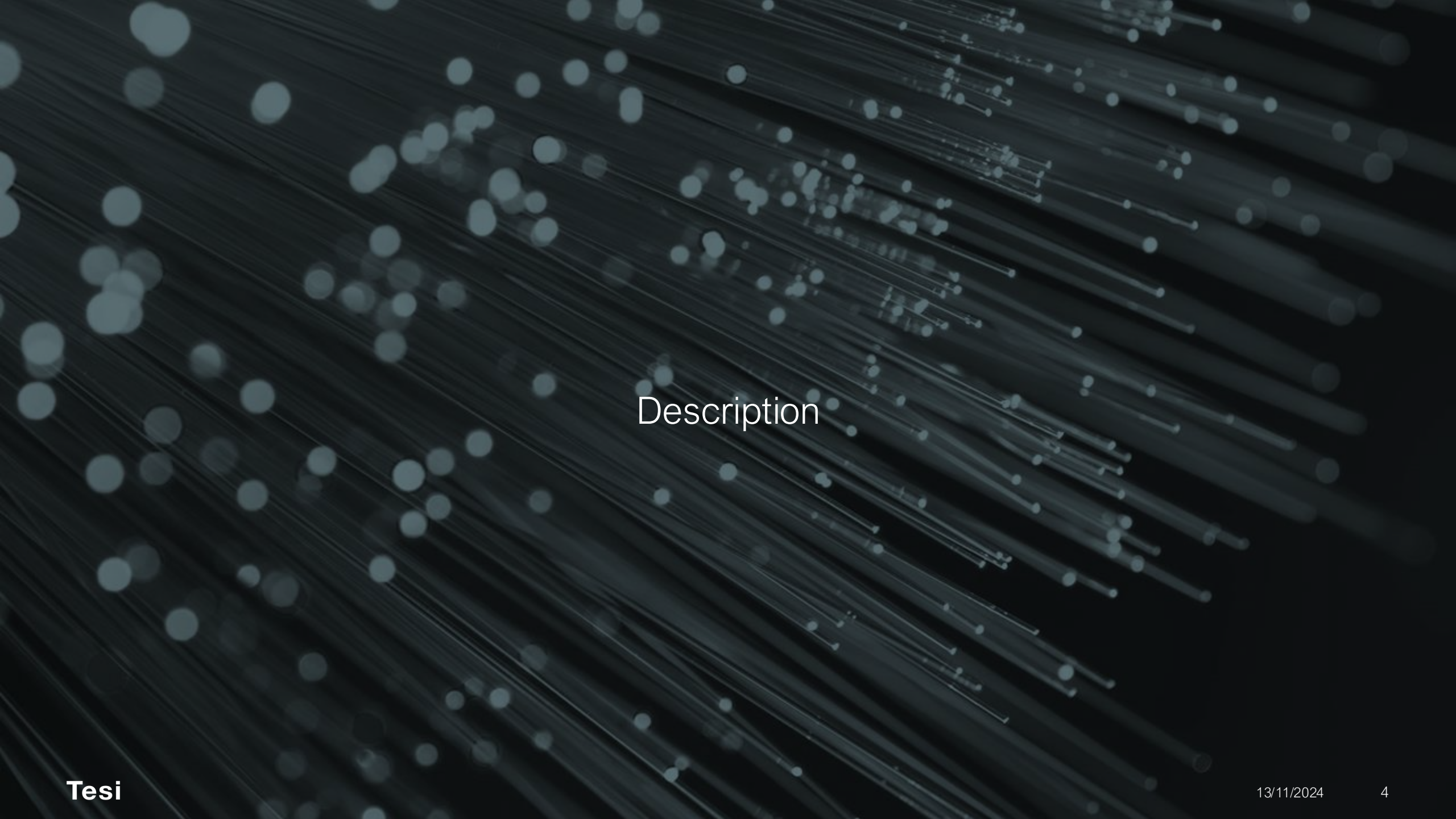
Findings & Insights

Investment volume is rebounding	Finnish **deep tech companies have raised €363 million** in funding **year-to-date 2024**, marking a 41% increase over the full year in 2023. After experiencing an investment market that first was over-heated and then cooled down very quickly, the market seems to have somewhat stabilized in 2024, as pointed out by the surveyed companies and interviewed investors. As reported by us previously, the later stage funding in Finnish deep tech landscape is still not firing with full cylinders, however, a few noteworthy later stage rounds have been raised this year.
Divergent paths in terms of business fortune	Developing a deep tech business from ground up takes years, and we are now starting to reap the rewards of the patience as companies like Oura, Bluefors and Iceye are truly emerging as global category leaders, leading the **Finnish deep tech companies to surpass €1 bn in total sales in 2023** for the first time in our research history. On the other hand, the challenging economic environment has taken its toll as bankruptcies have clearly been on the rise during 2023 and 2024 in the Finnish deep tech landscape.
Geopolitical change	The changed geopolitical instability has unfortunately been reality for a while now. In 2024, we have seen the effects in the Finnish deep tech investment landscape possibly more than any other year in the recent history. Pure military technologies have entered into Finnish venture capital, if not en masse, at least more notably than ever before in Finnish venture capital history. The concepts of dual-use and national security are more visible in Finnish deep tech deal flow and at least partly as a side-product areas like space technology and quantum are attracting investor attention in increasing manner.
Optimism for future	2024 has already seen a handful of food tech and sustainable material businesses close notable later stage funding rounds to scale their business and production capabilities to the next weight class. Meanwhile, Iceye raised €86m+ in their latest round, possibly fuelled by increased interest in satellite technology providing critical capabilities to national and infrastructure level entities. In the early-stage funding phase we have seen several seed rounds attracting high interest, hopefully yielding several larger funding rounds in 1-3 years' time. The deal flow we are already seeing now gives us confidence to predict the Finnish deep tech investment volume in 2025 will likely surpass the 2024 figures, possibly with a comfortable margin.


Description

Tesi's Deep Tech Description and Taxonomy

We consider companies to be deep tech if they are based on important scientific or engineering innovation with strong disruptive potential and high barriers to entry

New Materials

Companies developing new materials through technological innovations, including e.g. sustainable material, coating, liquid or food innovations

SPINNOVA®
ONEGO bio
INFINITED FIBER

Electronics & Semiconductors

Novel electronics and semiconductor innovations related to e.g. sensors, analyzers, IoT systems, and semiconductor manufacturing technology

Collo®
Wirepas
CHIPMETRICS

Digital Infrastructure

Companies developing disruptive innovations for the infrastructure layer operations, e.g. related to the quantum, satellite or data and telecom industries

HYCOM CORE
IQM
ICEYE

Energy & Climate Technology

Companies developing new energy and/or climate related technologies, for example carbon capture, new energy storage technologies

STEADY — ENERGY
hycamite
LIQUID SUN®

Optics

Companies developing optics and imaging solutions such as optical devices and sensors, laser technology and optics innovations in the AR/VR/XR fields

Distance
dispelix
PIXIERAY

AI & Robotics

Companies developing novel artificial intelligence and robotics innovations related to e.g. machine learning, multimodal pattern recognition, or autonomous mobility

THE HUMAN TOUCH ROBOTICS
algorithmiq
MVISION
- Artificial Intelligence in Medical Imaging -

Health & Biotechnology

Companies developing biotechnological applications for healthcare and medicine, and technologically advanced medical devices

NADMED
StemSight vision unlimited
RAPPTA THERAPEUTICS

Tesi's Definition of Deep Tech

Total[1]

Tesi

270

hand selected deep tech companies

Categories	# of companies
New Materials	24
Electronics & Semiconductors	47
Digital Infrastructure	17
Energy & Climate Technology	45
Optics	40
AI & Robotics	41
Health & Biotechnology	56

Definition

- Tesi's selection is hand-picked from the Finnish ecosystem, mainly from (VC) funded, but also including bootstrapped, companies. These companies have been manually screened and categorised as "deep tech" by our investment team members, and experts from collaborating organizations. Our criteria for deep tech companies:
  1. Science and research-based
  2. High technological barrier
  3. Company operates at the technological frontier
- We have identified 268 deep tech companies in Finland that can be divided into 7 categories.
- This year we have strived for list of active deep tech into removed all bankrupted companies from the main list of companies. This change in methodology lead to reduction of 13 companies overall.
- To give more detailed picture of deep tech companies we changed the taxonomy a bit. Digital infrastructure was split into two categories; Electronics & semiconductors and digital infrastructure.
- In this research we often refer to i) Early Stage and ii) Later Stage funding rounds. By Early Stage we refer in this report to Angel, Pre-seed, Seed and Series A funding rounds and by Later Stage to Series B and subsequent funding rounds.

[1]The scope of our research is limited to businesses with a registeted company ID. Thus, e.g research projects yet to be established as a business entity are not included.

Scope of the Research

Our mission is to improve ecosystem transparency by promoting collaboration among a growing array of market participants, which in turn provides a more holistic view. This year, we undertook our most extensive research process to date, engaging deep tech companies and venture capital funds to deepen our understanding of the ecosystem's development. As a result, we cover more important topics in our research than ever before.

	Survey to Deep Tech companies	Finnish Deep Tech investor interviews	Quantitative Analysis
Description & Purpose	○ Deepen the understanding of key phenomena and underlying developments in the ecosystem ○ 79 Finnish Deep tech companies answered the survey	○ We interviewed the 4 prominent Finnish VCs with a stable track record of deep tech investments ○ Fund interviews covered similar topics as the company surveys, with some extra topics like development of LP interest	○ Quantitative analysis provides a high-level understanding of the development of the ecosystem ○ Data-analysis contains topics such like analysis of private equity investments, investors, and company financial data
Methodology	○ The questionnaire was sent to all deep tech companies in our definition ○ The survey was conducted via SurveyPal	○ Interview (60-90 min) per investor	○ Tesi's data model is used as the main data source, which includes multiple different data sources, including Pitchbook, Dealroom, Talouselämä (Finnish media), Bureau van Dijk (Orbis), Mergermarket, and other data sources
Limitations	○ Response rate: 28.5% (79 out of 270) ○ The sample of responses may not give full picture of Finnish deep tech ecosystem	○ The investor interviews covered four different venture capital funds, thus, while we believe the results reflect well on the general view by Finnish deep tech investors, they do not represent views of every Finnish deep tech investor	○ The data utilized may be partially incomplete or faulty

Deep tech company survey in detail

Sample

36 questions ranging from company background to views of the funding market and business outlook among other things

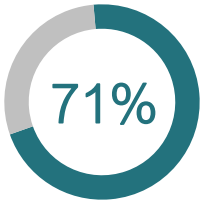
79 respondents out of **270** deep tech companies

The survey was responded by mainly deep tech company **co-founders** and **CEOs**

Sample description

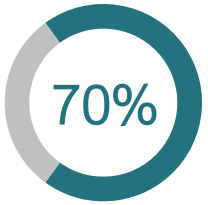
B2B in focus

As typically in deep tech, 95% of the sample are B2B (or B2G) businesses



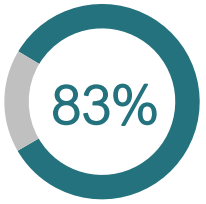
Hardware leaning technologies

71% of the surveyed businesses identified hardware as a core component of their product



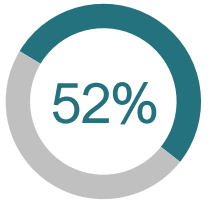
Founding Team Size

70% of respondents have a founding team of 3+ persons



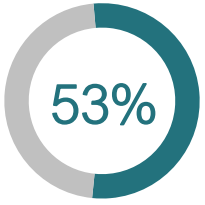
Founding Team Experience

83% of respondents have prior founder experience in the founding team



Balanced sample in terms of funding

52% of the surveyed businesses have either bootstrapped or gathered seed funding so far, while 48% have raised also later stage financing



Spin-offs well represented

53% of respondents were originated as a spin-off from another entity

Topics covered in the survey

Founding team and company background

Finnish deep tech investment landscape

Company's innovation, growth and positioning

Recruitment plans

Finnish deep tech companies competetive advantages and weaknesses


Finnish deep tech companies

Comments from the Market

MAKI.VC

Maki.vc is an early-stage venture capital firm partnering with deep tech & brand-driven startups obsessed with challenging category norms. Their portfolio consists of deep tech companies such as Onego Bio, IQM and Pixieray.

In most cases, deep tech companies are founded by teams with strong backgrounds in research or product development, as deep tech innovations require a primary focus on building and validating technology from the outset. However, it's essential to simultaneously begin exploring product-market fit early on to keep the commercialization roadmap on track.

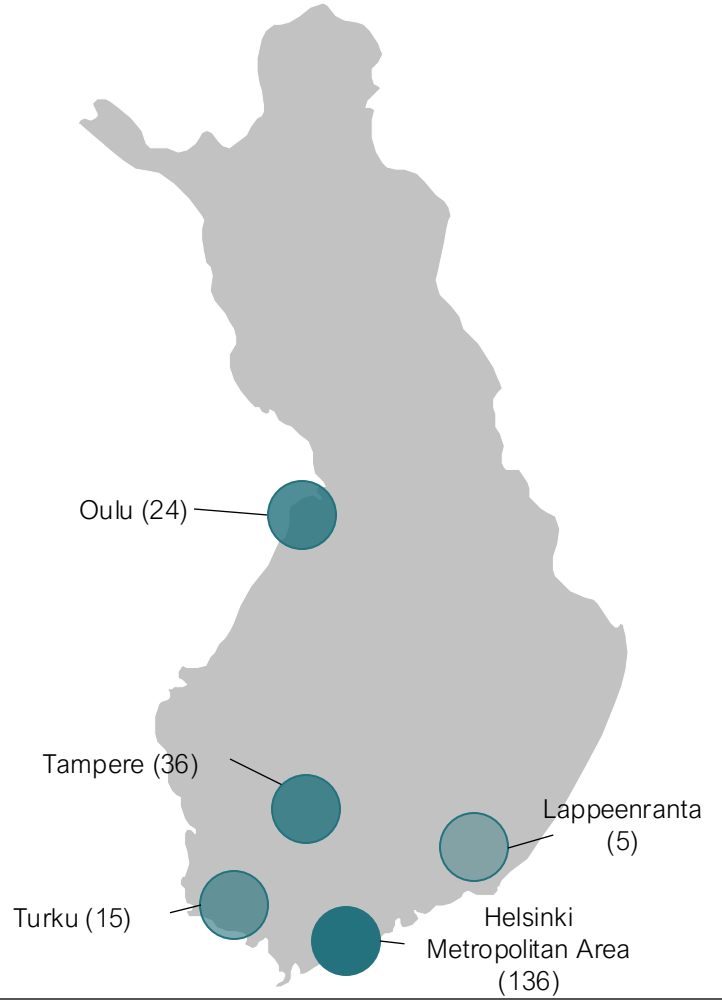
As the first venture capital investor in many deep tech companies, we prioritize evaluating team composition above all else. The ideal founding team brings a complementary set of skills: members with robust R&D expertise alongside those with a proven track record in leading the commercial side of a deep tech company.

As the product hits the market and commercial scaling kicks off, it's crucial for the organization to grow not just in R&D, but also by adding commercial roles in areas like sales and marketing. This calls for management to create a work culture that truly motivates both technology-driven and business-minded team members.

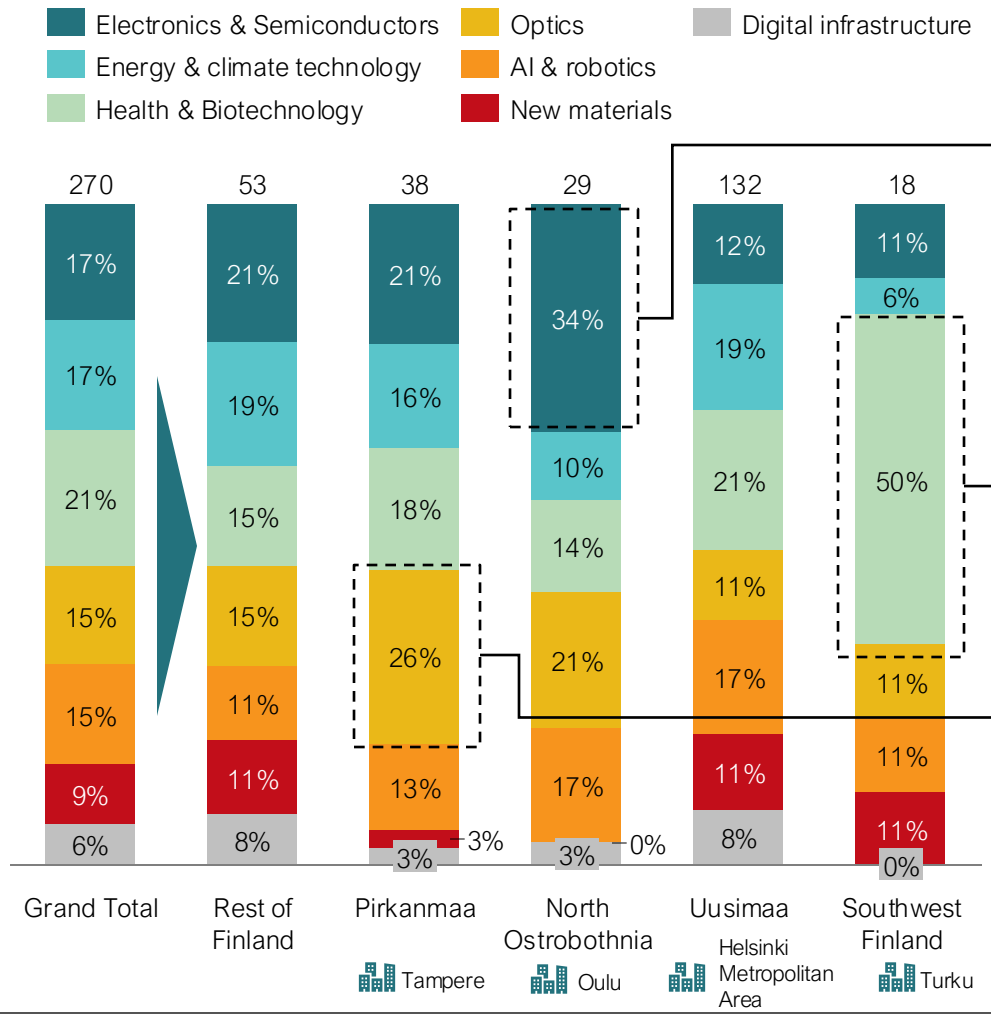
Paavo Räisänen, Partner

Deep Tech is Concentrated Around Universities – with Regional Differences in Ecosystem Composition

Deep tech Hubs[1]
# of companies



Number of companies per region and category[1]
# of companies



Examples of regional specialities

Oulu has a long history with electronics & semiconductors, as Nokia have always had important research units in Oulu (and is currently building completely new campus to the city).

Turku produces significant amount of world class health & biotech companies, as Turku BioCity center is one of the most important research centers in the field in Finland

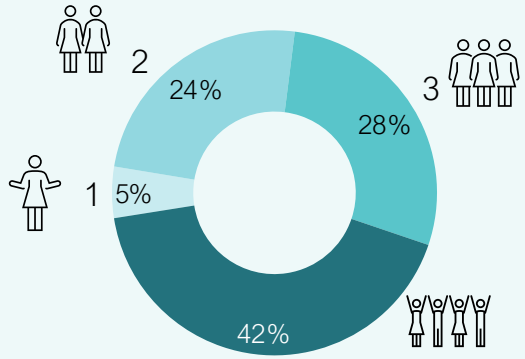
Tampere University hosts Optoelectronics Research Centre, leading to several optics companies to being founded in the area

[1]Tesi's datamodel

Founders of Finnish deep tech companies, and what investors are looking for

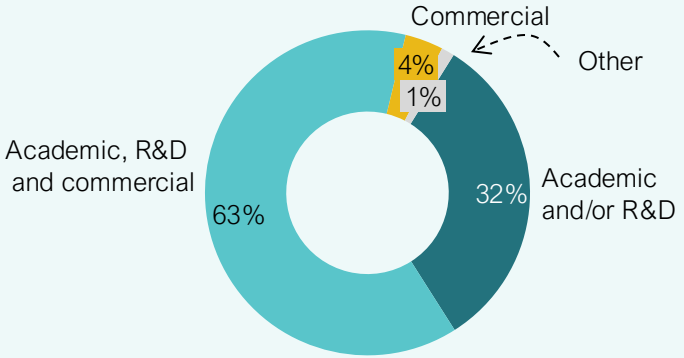
Finnish founder teams in a nutshell[1]

Number of founders in deep tech companies



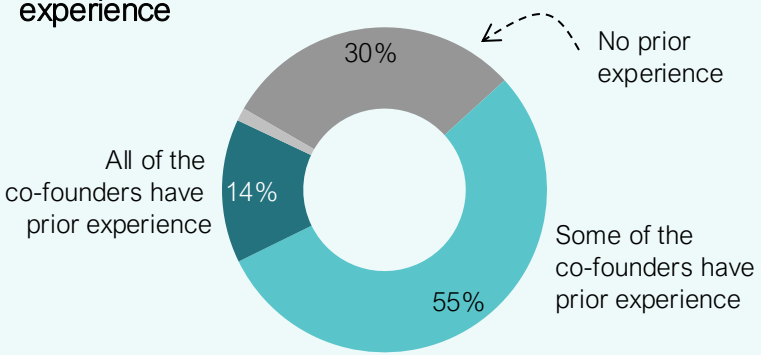
70% of deep tech companies have at least 3 founders

Dominant backgrounds in founding teams



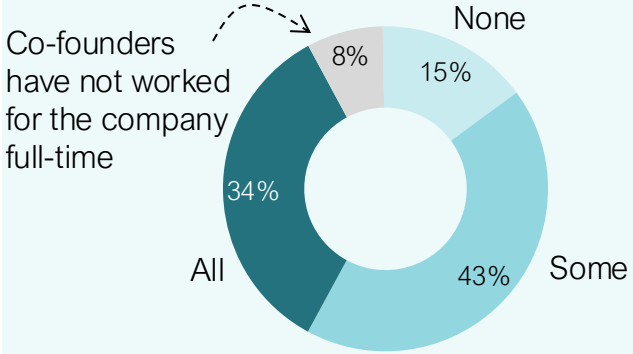
Majority of founder teams have dominant backgrounds ins academia, R&D, and commercial

Share of founding teams with previous entrepreneurial experience



69% of founding teams have some previous entrepreneurial experience

Share of founders still working for the company



With 77% of companies, at least some of the original founders still work in the company

What investors look for in a deep tech team?

Science and technological knowledge

- World class scientific and / or technological knowledge and the team's capability to build the first versions of the technology are essential.

Founders with a business drive

- Investors appreciate a founding team that has robust commercial know-how or at least the drive to learn it, which will enable advancing the customer discovery from the start.

Sense of urgency and compulsive need to succeed

- VCs of any kind look for companies able to scale fast. Deep tech often requires long development cycles, thus teams need to be able to learn and iterate fast.

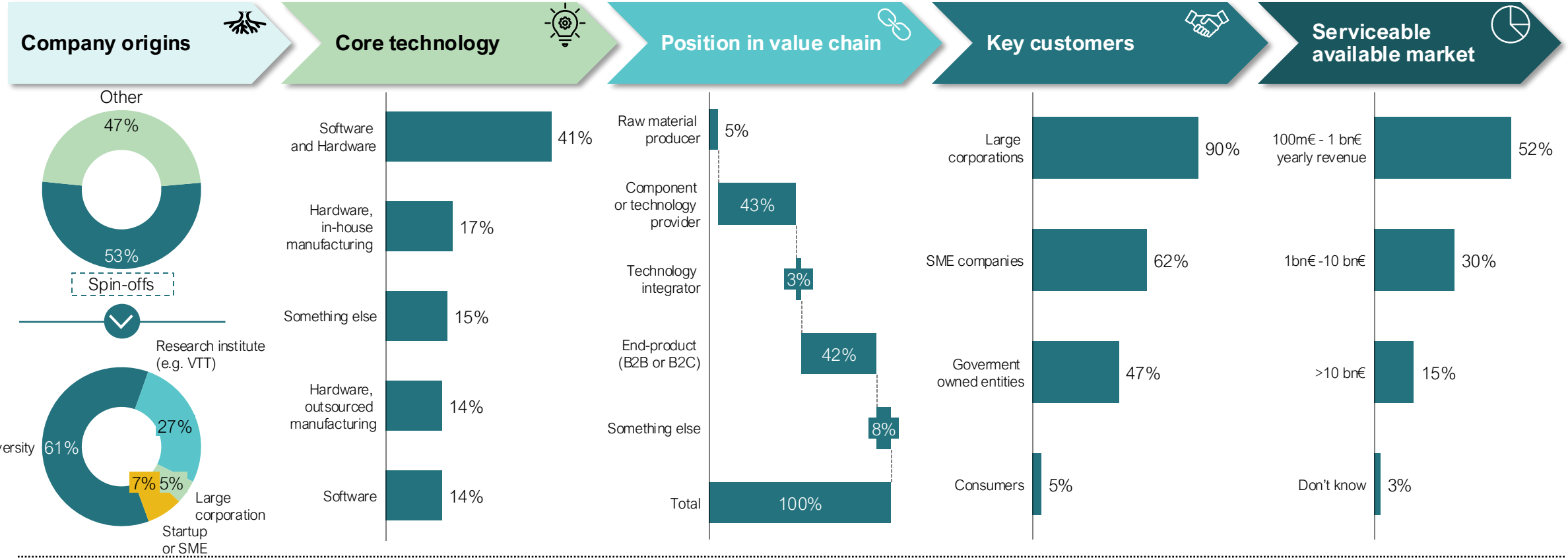
Vision and communication skills

- Having and communicating a clear long-term vision sounds easy, but it shouldn't be taken for granted. Your vision should be clear enough to resonate with people that aren't deep-experts of your domain.

[1]Tesi's survey directed to Finnish deep tech companies (n=79)

Finnish deep tech business models in a nutshell according to our survey results[1]

Typical deep tech company we surveyed is a university spinnoff, with disrupting innovation combining software and hardware, being a component (or technology) provider or end-product producer for large corporations, in niche market segment



Most commonly Deep tech companies are spin-offs from universities, but other origins still have quite remarkable share

Hardware is an essential part of deep tech but you usually need software to manage it. 59% of surveyed deep tech innovations include software as a part of its core technology.

Almost all deep tech companies are either component (or technology) providers or end-product producers.

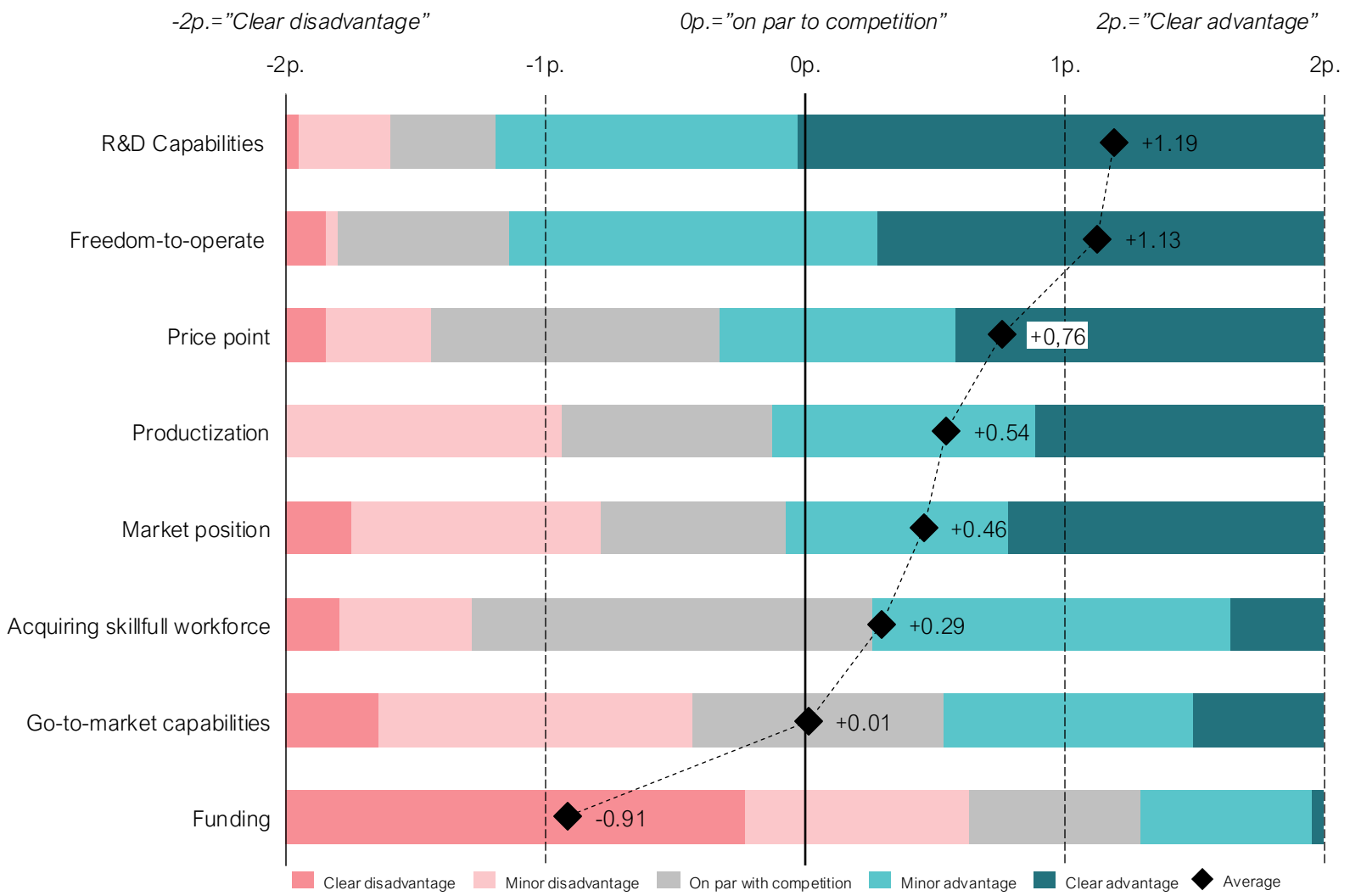
At least for now, consumers are rarely the key customers of deep tech companies. Most of them operate in B2B and B2G sectors.

Majority of companies operate in niche markets, as 52% of companies have SAM (serviceable available market) under 1 bn.€ per year

[1]Tesi's survey directed to Finnish deep tech companies (n=79)

Finnish Deep Tech companies see themselves being highly skilled in technical domains, while commercial capabilities could be better

Competitive advantages and disadvantages of deep tech survey respondents, by theme[1]



Comments

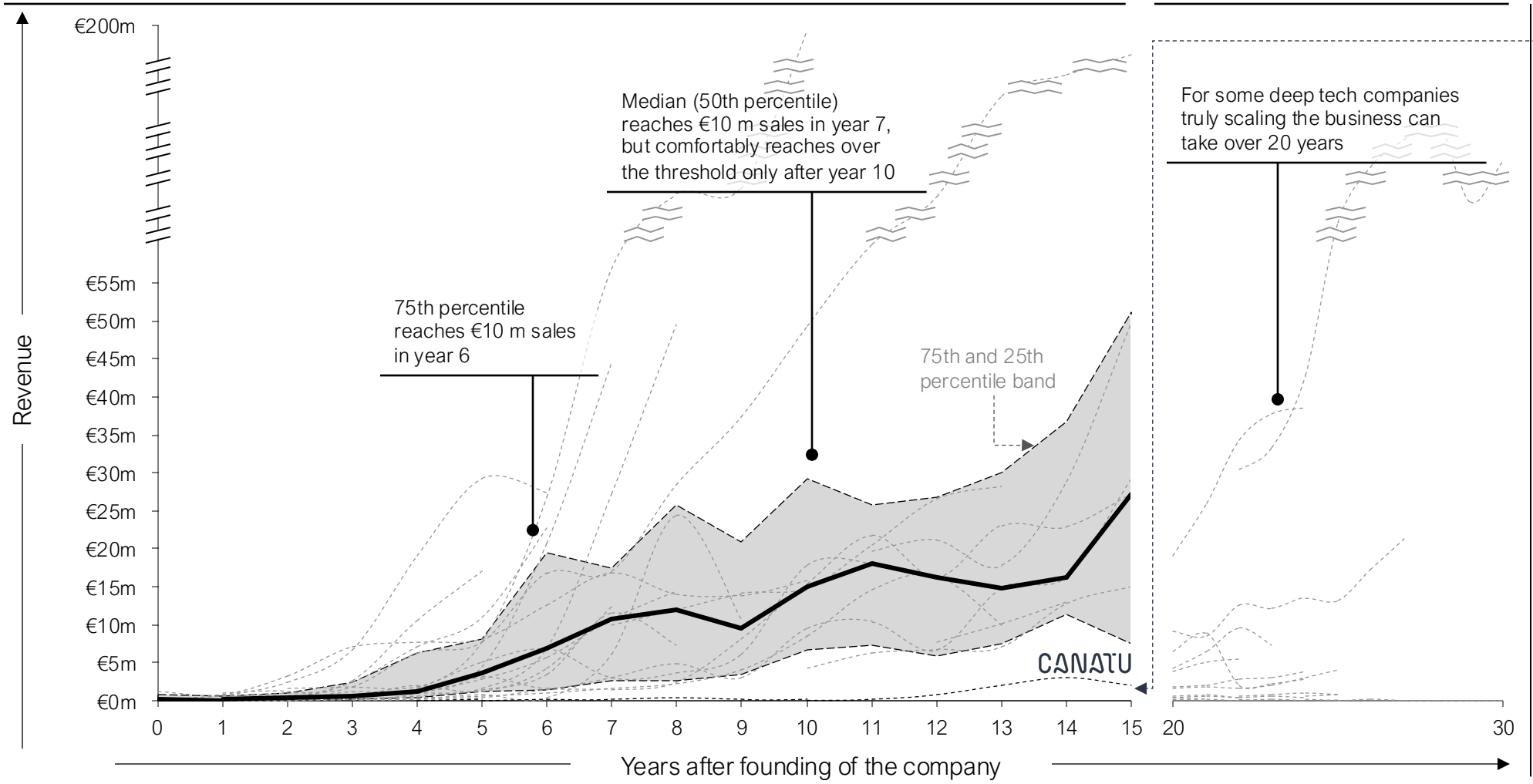
- Most of Deep Tech companies identify being better in "hard skills" than "soft skills".
  - Their competitive advantage is above all built on R&D capabilities and freedom-to-operate
  - Meanwhile companies are considerably weaker with raising funding, go-to-market capabilities, and acquiring skilful workforce
- All interviewed investors are along the same lines with the companies, remarking how Finnish deep tech companies are relatively good in scienctific or technical innovation. On the other hand, topics or skills such as customer centricity, productization and fundraising are areas where Finnish deep tech startups sometimes have room for development.
- It is not uncommon for a deep tech founding team with prior backround in science to be a bit behind what comes to commercial know-how. As seen by VCs, these skills can be learned with commitment and effort. While hiring commercial expertise to fill this know-how gap is beneficial, top founding teams also work to develop this knowledge independently.

[1]Tesi's survey directed to Finnish deep tech companies (n=79)

Operating at the technological frontier produces long development cycles even for the successful companies

First 15 years from foundation to scaled deep tech companies[1]…

Revenue (€m), analysis only contains companies with at least 10m€ revenue

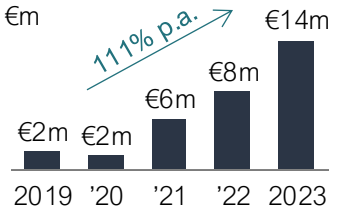


… and years 20-30[1]

Case example[2]

CANATU

Canatu sales 2019-2023



- *Founded in 2004 as spinnoff from Aalto university*
- *SPAC merger in 2024*

Canatu is the global leader in developing advanced carbon nanotubes. It took 11 years for company to reach mass production of CNTs in 2015, and further 6 years to truly find the growth opportunity in semiconductors (in '21). The company serves as a good example of how long the development cycles can be when operating at true technological frontier.

[1]Data is based on Tesi's data model, which includes multiple different data sources like Pitchbook, Dealroom, Talouselämä (Finnish media), Mergermarket, and other datasources. Data contains VC investments, angel investments, and traditional growth capital

[2]Company material


Investments to Finnish Deep Tech in 2024

Comments from the Market

Butterfly

Butterfly Ventures invests in pre-seed and seed stage startups in the Nordics and Baltics, with a focus on deep tech and hardware. Some of their investments include e.g. Flow Computing, Uute Scientific and Cooliblade.

2024 has witnessed modest growth of investment volumes in Finnish deep tech companies. On the macro-level, the continued geopolitical instability has its effects, while lower interest rates might have supported the recovery. Also, the relatively high levels of uncommitted dry power in the VC funds along with investment periods approaching their end do play a role.

The investment activity in early-stage funding rounds has remained bright in 2024 with several notable pre-seed or seed rounds of Finnish deep tech companies having already materialized. The later stage investment volumes are also brightening up, while still driven by a handful of larger funding rounds. Thus, the investment environment is rebounding but we still have work left to reach our potential.

Early-stage investors often focus on the credibility of the team, strength of the technology and the future market potential. After the first funding round is done, the company needs to spend the capital raised very efficiently to meet the milestones and gain "critical mass" of both technological and commercial validation to attract suitable investors in the next funding round. Most later rounds are very dependent on meeting the numbers and gaining enough critical mass and speed quickly enough.

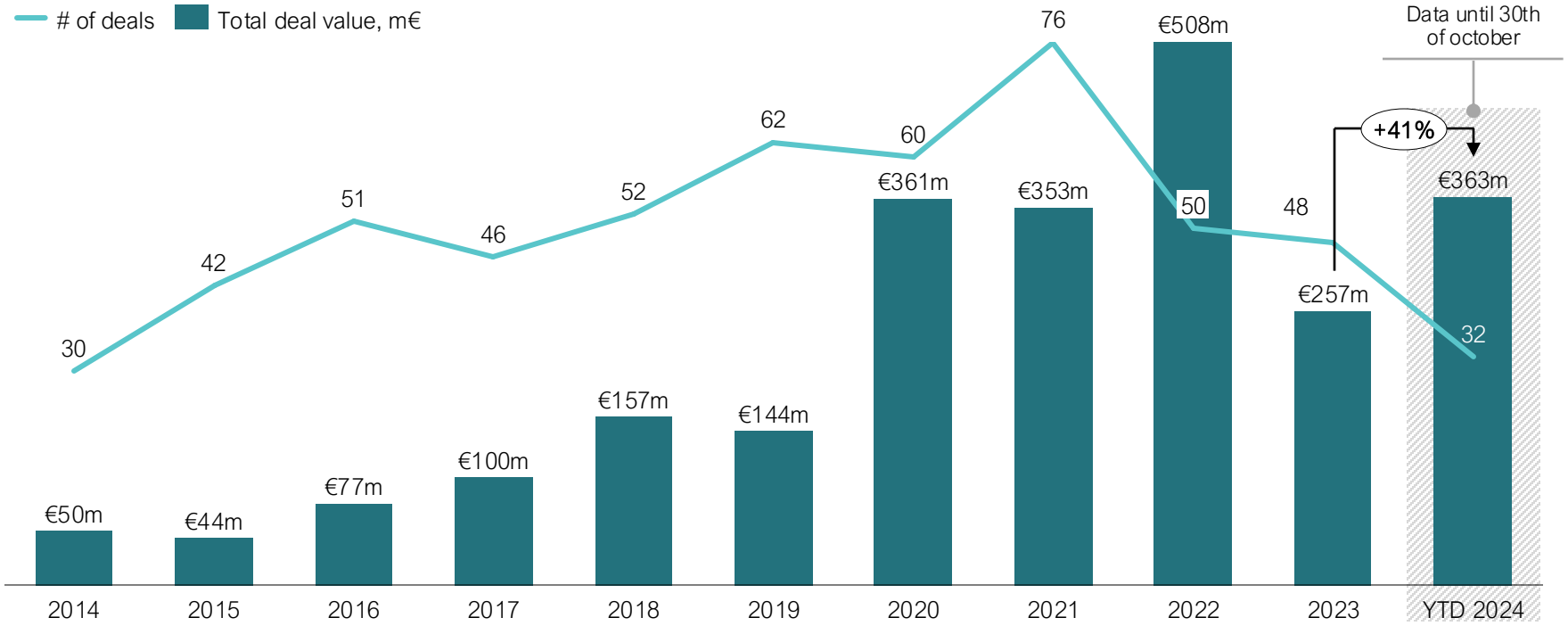
The Nordic market is missing Silicon Valley style full-life cycle fund capacity. Therefore, the first investors to your company are seldomly the same investors, who lead the investment rounds in the later scaling phases. This means significant friction and delays whenever a lead investor change is required, especially if early investors cannot pitch in significant amounts to catalyze the round coming together.

Juho Risku, Partner

Moderate recovery in deep tech investment activity during 2024 still leaving desire for more

- After the significant downturn in year 2023, the investments are back in the growth path, as we have observed 363 m€ investments (41% growth to FY2023) in 2024 year-to-date directed to Finnish deep tech
- Last year we estimated range of 450-650 m€ for 2024 deep tech investment volume in Finland. Considering we approaching the midpoint of Q4, it seems we will likely achieve the lower end of the range by the end of the year
- Total invested capital, as usual, is driven by larger investment rounds. Overall number of deals is quite low as the production of new companies is stagnating
- Considering that many deep tech companies are currently a lot more evolved than in 2020-2022, the investment volume is not very high. Many of our companies are hitting scale, and the total invested capital should be higher than in 2022 to satisfy the capital demand

Total invested growth capital to deep tech companies, 2014-2024[1]



€2.3 bn.

Total invested capital (2014-2024)

549

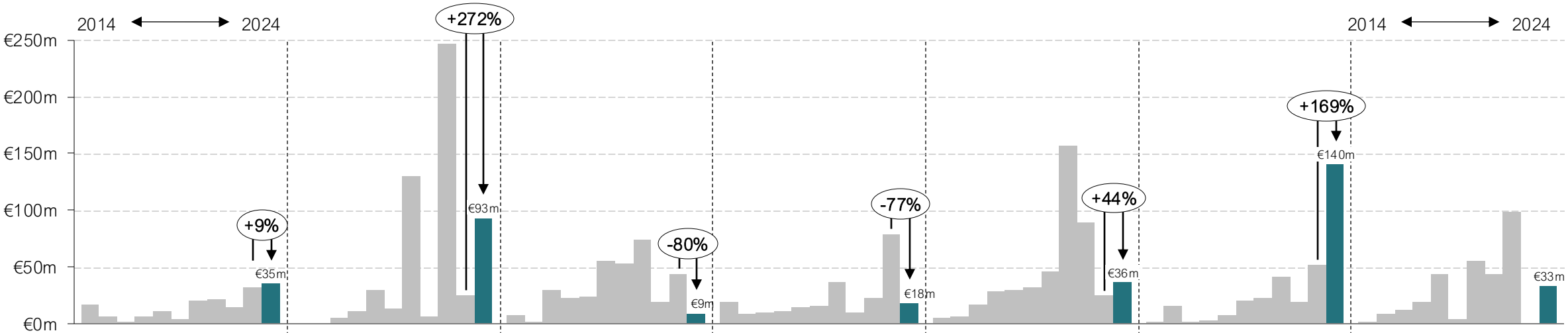
investments (2014-2024)

[1]Data is based on Tesi's datamodel, which includes multiple different datasources like Pitchbook, Dealroom, Talouselämä (Finnish media), Mergermarket, and other datasources. Data contains VC investments, angel investments, and traditional growth capital

Year-on-Year growth is driven by large funding rounds in Digital Infrastructure and New Materials

- Essentially all the €20m+ funding rounds in Finnish deep tech market in 2024 have been done in either Digital Infrastructure or New Materials categories of our deep tech classification.
- A handful of businesses in New Materials category, mostly with capex heavy business models, have raised larger funding rounds in 2024, accounting for more than 90% of the investment volume year-to-date in the category. It remains to be seen if similar investment volume is replicable in 2025.
- While total investment volume up-to-date is smaller in categories such as Optics, Health & Biotechnology and Energy & Climate Technology, several promising early-stage rounds including valued Finnish and foreign investors have occurred this year with possibly more to come during 2024. We feel optimistic about some of these companies contributing to overall Finnish deep tech investment volumes through larger later stage rounds in the next couple of years.

Total invested growth capital to deep tech companies by category, 2014-2024[1]



	AI & robotics	Digital infrastructure	Electronics & Semiconductors	Energy & climate technology	Health & Biotechnology	New materials	Optics
Total ('14-'24)	**€198 m**	**€560 m**	**€357 m**	**€266 m**	**€496 m**	**€325 m**	**€319 m**
5y Avg. ('19-'24)	€21 m	€86 m	€42 m	€30 m	€64 m	€49 m	€47 m

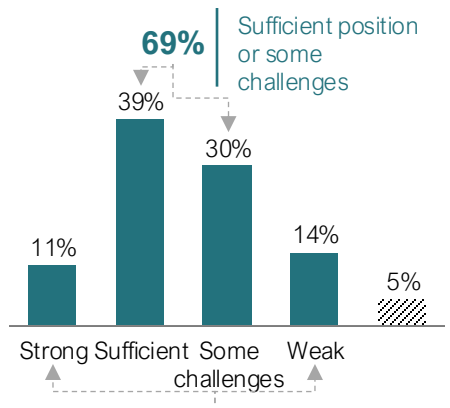
[1]Data is based on Tesi's data model, which includes multiple different data sources like Pitchbook, Dealroom, Talouselämä (Finnish media), Mergermarket, and other datasources. Data contains VC investments, angel investments, and traditional growth capital

Market sentiment seems overall stable, some positive signals observable

Indicative observations of market sentiment[1]

Valuations	○ After the downturn in valuations in 2022-2023, the valuation levels seem to have stayed stable or possible risen very modestly since. However, overly generalizing valuation levels can be misleading as we've seen sector-specific valuation level developments happening, e.g. valuations to everything AI-related have risen exponentially since early 2023.
Fundraising duration	○ According to our survey, 60% of the rounds during the last 12 months took 6+ months to close, meanwhile 33% of the rounds took more than a year to close. However, many of the funding rounds with longer fundraising timelines were later stage rounds as majority of the funding rounds that took less than 6 months were early stage rounds.
Domestic and foreign investor access	○ Investor access to both foreign and domestic investors on a reasonable level. 62% of respondents have had access to Finnish VCs without challenges. 54% of respondents had attracted strong interest from foreign investors. According to interviewed VCs, interest from international investors hasn't changed notably lately, as the interest is always case specific
LP interest to deep tech	○ VCs also share the view that LPs (limited partner, an investor to a VC/PE fund) are by now accustomed to deep tech being a part of VC fund's investment strategy. The number of VC funds focused on deep tech grew notably between 2020-2022[2], but the growth rate has declined since. This shows that deep tech is not the only talk of the town for the fund investors.

Companies' position in funding negotiations[1]



Thematic Observations from us and other VCs

Quantum and semiconductors

Interviewed VC funds pointed that quantum and semiconductor related companies are gathering increasing interest both in Finland and abroad. Global need for computing capacity is on astronomical growth path due the global AI boom, creating opportunities for semiconductor and quantum companies.

Space technologies

The Finnish space technology landscape is not large in number of companies, but few Finnish companies in the space (pun intended) have taken notable steps towards market leadership, which has been noticed by investors in Finland and abroad alike. Some of the contributing factors may be linked to the growth drivers mentioned below.

MilTech and Dual-use

MilTech and dual-use technologies are gaining interest from investors, as the government spending in the sector is growing for the foreseeable future. The industry has many unique aspects (e.g. unique bureaucracy and procurement processes) creating unique challenges for companies and investors.

Finnish novel artificial intelligence

The hyper-growth of AI sector has spurred several Finnish companies that operate in the AI application layer, utilizing third-party AI platforms. However truly novel AI technologies are very few in numbers.

Still some positive development can be observed. Silo AI's recent acquisition proves Finland has some world class talent in AI development. Meanwhile the founding of Ellis Institute shows increased amount of research being conducted on the field in Finland.

Capex-heavy climate technologies

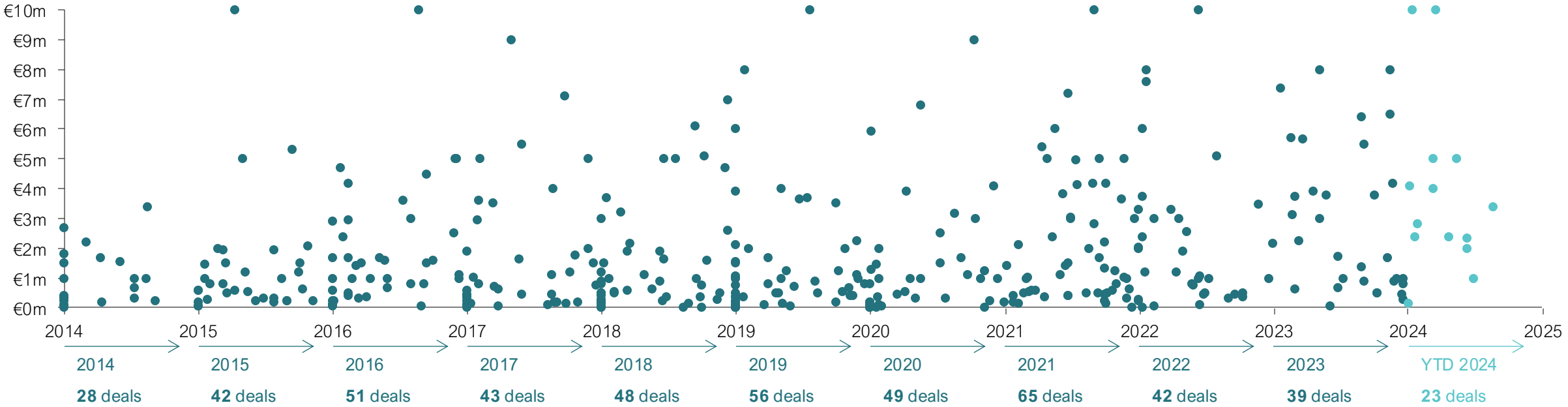
Even though few larger rounds in this space materialized in 2024, for early stage climate technologies, the availability of non-dilutive funding options to cover the capex needs is limited. Finding investors capable and willing to write large enough cheques for investment rounds needed for production plant establishment is not easy and usually requires raising non-dilutive financing together with conventional equity funding. This is not an easy equation and might limit the growth potential of the sector in the near-future

[1]Tesi's deep tech company survey (n=79), Company's assessment of negotiation position on latest or ongoing fundraising
[2] Boston Consulting Group (2023)

Early-stage deep tech funding in Finland has remained bright in 2024

- Deep tech early-stage investment has stayed relatively stable across the market turbulence in 2023. So far Finnish investors have had the capacity to fill the early-stage demand for capital due to notable increase in number of Finnish VCs in the 2010's and early 2020's. The decrease in deal numbers is above all evidence of decreasing in number founded companies than the availability of capital
- Globally, early-stage venture capital proved more resilient than later stage VC during 2022-2023, with funding round sizes rising notably, particularly in seed stages[2]
- As noted by several Finnish VC investors, the early stage funding is in a good state. The most attractive new companies are already raising seed rounds with relatively high valuations and competition between VC funds for these high-interest deals is starting to heat up.
- Even though our deep tech company survey provides some evidence regarding the early stage deep tech funding landscape needing development, no particular pain points regarding the early stage funding rose above others. From a company's point-of-view, naturally the more applicable investors the better.

Deep tech investment rounds <=10m€, 2014-2024[1]



[1]Data is based on Tesi's data model, which includes multiple different data sources like Pitchbook, Dealroom, Talouselämä (Finnish media), Mergermarket, and other datasources. Data contains VC investments, angel investments, and traditional growth capital
[2] Bain & co. Global venture capital outlook (2024)

Notable **Early Stage** funding rounds in 2024

Distance

Distance Technologies has created the first glasses-free mixed reality solution that turns transparent surfaces into immersive 3D displays.

€2.5m + €10.0m

G/ FOV VENTURES MAKI.VC

FLOW computing

Flow Computing is enabling the next generation of CPU performance for the most demanding applications, such as locally-hosted AI and general-purpose parallel computing.

€4.0m

Butterfly FOV VENTURES SUPERHERO CAPITAL Stephen Industries

STEADY — ENERGY

Steady Energy designs, constructs, and operates compact, advanced nuclear heating plants. Their simple approach enables scalable, cost-effective, zero-carbon district heating nearly anywhere.

€10.0m

LIFE LINE VENTURES YES VC

QMill

QMill develops quantum-advantage algorithms which will be executed on near-term quantum computers to solve complex problems that are too large for existing supercomputers.

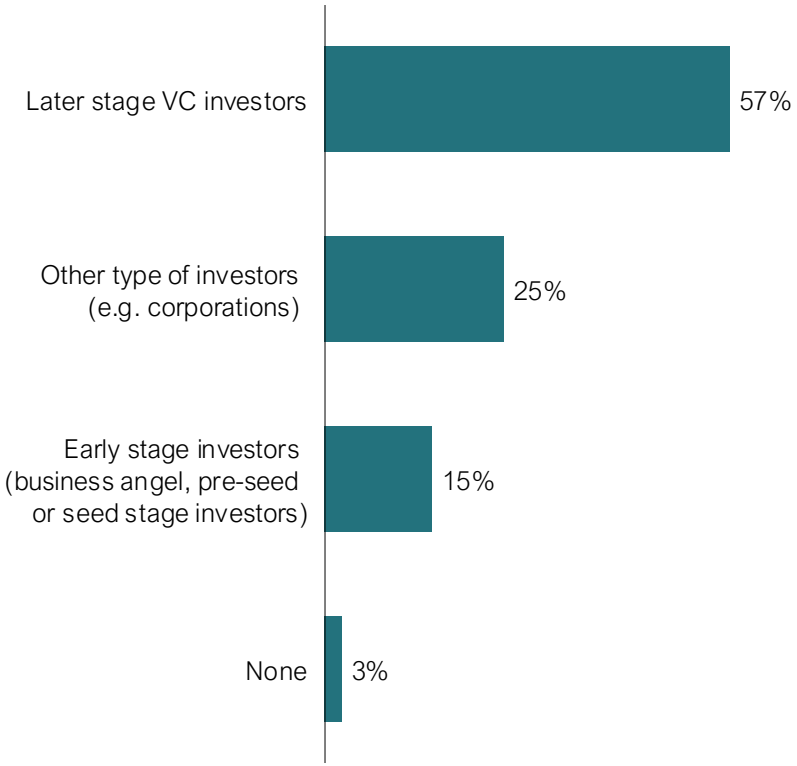
€4.0m

ANTLER MAKI.VC Kvanted

Cause, effect, and outcome of later stage gap in the ecosystem

Cause: Finland has gaps in the ecosystem

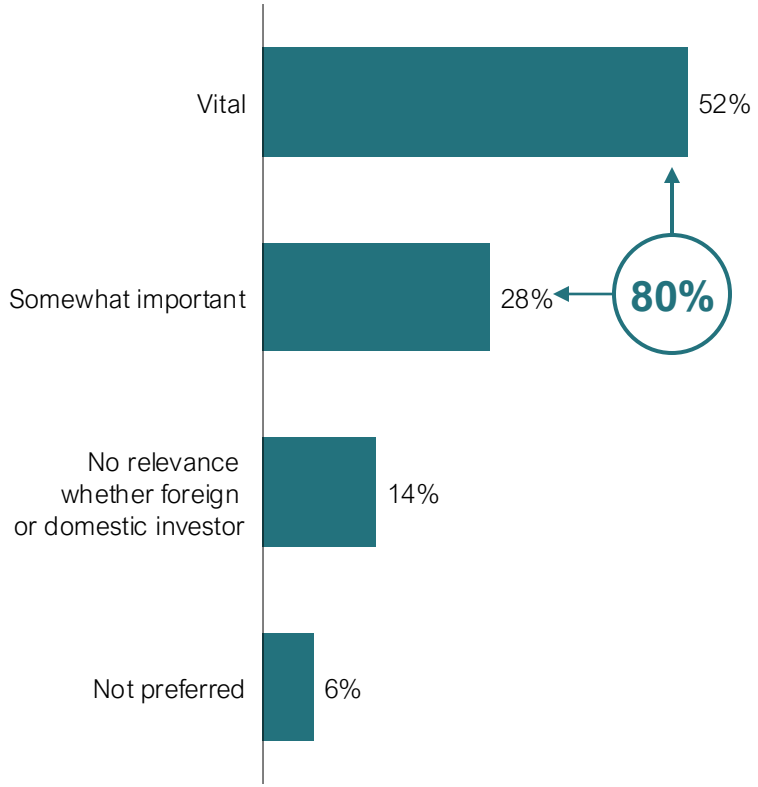
Most lacking applicable equity funding options in the Finnish deep tech ecosystem[1]



Finnish ecosystem is lacking on late stage VC funding, as well as corporates and other types of investors

Effect: Eyes turn abroad

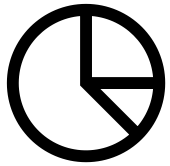
Importance of international equity funding for deep tech companies[1]



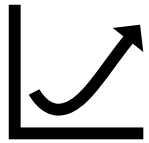
4 out of 5 deep tech companies consider international equity funding important, and over half consider it vital

Outcome: The late stage takes effort

Based on analysis on deep tech company investor data[2]



Foreign investors in 90% of rounds over €20m



Syndicate sizes grow considerably as the round sizes increase. In some large rounds the syndicates have grown up to 15+ investors

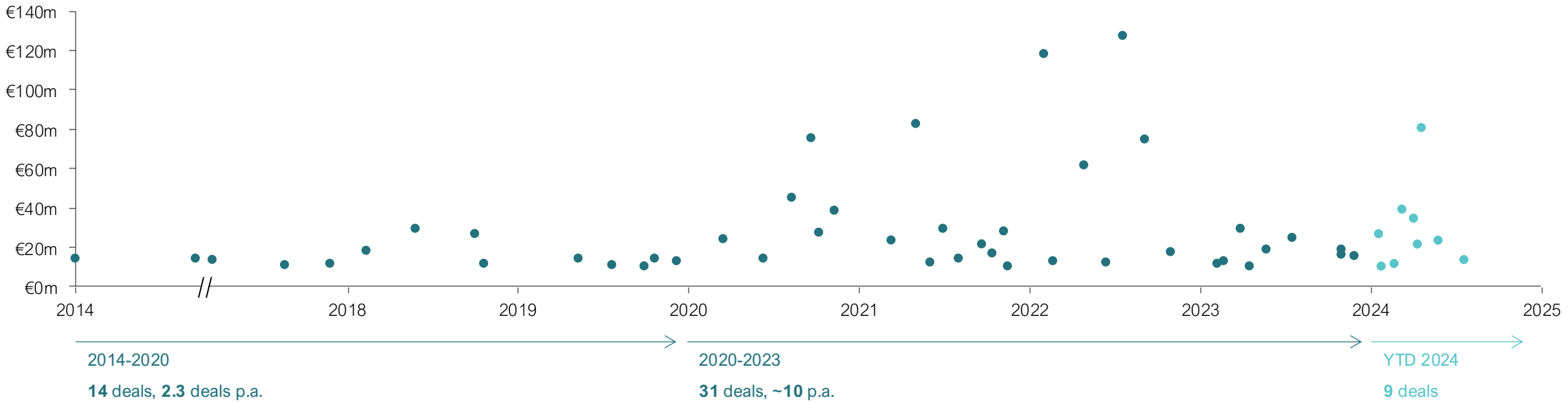
Raising funding in later stages takes hard work, time, and long-term planning even for companies with great momentum, as companies need to find large syndicates internationally

[1]Tesi's survey directed to Finnish deep tech companies (n=79)
[2]Tesi's data model, Pitchbook investor data

The lack of investor supply still hinders the materialization of more later stage rounds

- In year 2024 we have seen some positive signs in the later stage funding landscape, when compared to the situation in 2023. We are especially delighted to observe how FOAKs[1] have managed to raise substantial rounds, as capex intensive business models have never been in the limelight of venture capital funding.
- In our deep tech company survey, the later stage rounds represent significant majority of long fundraising processes (+>12 months). Surveyed companies also pointed out that later stage funding is the area where we lack suitable financing the most in Finland.
- Finnish VCs have consensus opinion that overall deep tech companies are usually successful in raising later stage funding rounds, but the lack of applicable equity options cause the investment rounds to end in a smaller size and/or taking longer than the company targeted.
- Globally later stage VC funding volume has been in a down trend since the 1st quarter of 2023 when measured by average deal size[2].
- Our observations align with the market; raising later stage funding demands incredible effort from deep tech companies. The success cases we've witnessed this year are more evidence of the effort by the founders than the market development in general.

Deep tech investment rounds >10m€, 2014-2024



[1]First-of-a-Kind (FOAK) typically refers to pioneering products or business models being implemented for the first time, usually involving significant capital expenditures, such as production plants or large-scale infrastructure
[2] Bain & co. Global venture capital outlook, 2024

Notable **Later Stage** funding rounds in 2024

ICEYE

ICEYE is the global leader in synthetic aperture radar (SAR) satellite operations for Earth Observation, persistent monitoring, and natural catastrophe solutions.

€86.1m

SOLIDIUM · BLACKWELL CAPITAL GROUP · MOVE CAPITAL

ONEGO bio

Onego Bio is a food-biotech company revolutionizing the food system by harnessing the power of precision fermentation to manufacture real egg protein entirely animal-free.

€37.4m

NordicNinja · Tesi · AGRONOMICS · MAKI.VC

INFINITED FIBER

Infinited Fiber's technology turns materials that would otherwise be landfilled or burned into something truly valuable – Infinna™, a premium textile fiber that reduces the world's reliance on virgin resources.

€40.0m

INDITEX · mundi ventures · Goldwin · YOUNGONE

enifer

Enifer is a biotech start-up that harnesses the power of fungal fermentation to upcycle agrifood industry byproducts into nutritious mycoprotein ingredients.

€36.0m

TAALERI Bioindustry · Valio · CLIMATE FUND · Voima Ventures · Nordic Foodtech VC

Deep tech investor groups, specialities and observed development

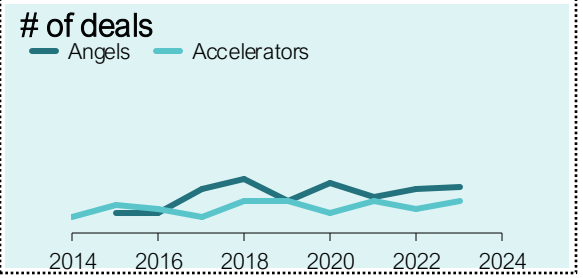
Investor types[2]

Angels, accelerators, and crowdfunding

Angels, accelerators, and crowdfunding typically provide equity at company's first steps.

Angel investors have significant role in biotech in all stages, as the vertical lacks institutional investors, and there exists some angel giants.

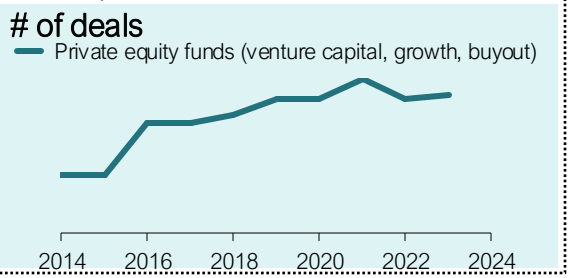
Recently crowdfunding has played remarkable role in later rounds, as multiple deep tech companies have managed to raise substantial rounds through companies like Springvest (currently growing close at to 100% YoY[1]).



VCs and later stage growth capital

VCs can be categorized by their investment stage and focus areas. Finland contains almost exclusively early-stage VCs often with generalist focus. These VC's have nonetheless invested to deep tech notable amounts, carrying significant role in the earlier rounds.

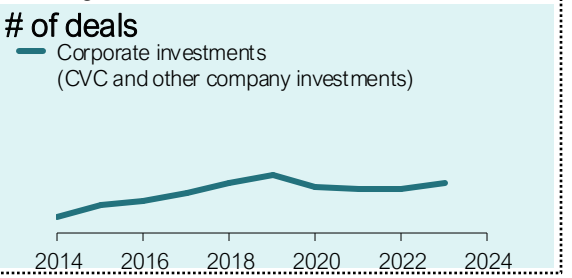
Historically, traditional Growth Private Equity investors haven't been active in the deep tech sector due to several reasons (e.g. technology validation, long path to profitability), however, few successful companies (e.g. Picosun, Bluefors) have had also Growth PE investors.



Corporate Venture Capital, and other corporate investments

Corporate VCs most often, but not always, look for startups that have synergies with the corporate's core business or new emerging business line, enabling value-add potential for both the investor's and investee's business.

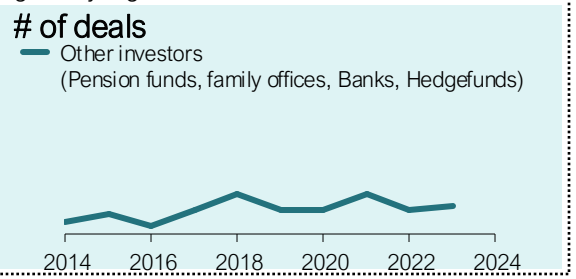
Large bulk of Finnish corporates operate in industries with only partial or no synergies with many of the deep tech verticals. Thus, a large portion of corporate investments comes from outside of Finland. E.g. Infinited Fiber has managed to acquire investments from global textile giants.



Other investors (Pension funds, family offices, Banks, Hedge funds)

Investors like pension funds, and family offices are potential investors for deep tech companies especially in later stage when some of the risk associated with company's development is already mitigated. Family offices have increasing importance not only in investing in the Finnish VC funds, but we have also observed some family offices increase the direct investments to deep tech companies.

Banks and hedge funds have been noted to be potential investors if the company reaches globally significant scale.



Public sector

BUSINESS FINLAND

Centre for Economic Development, Transport and the Environment

FINNVERA

Important public organisations for funding deep tech companies with grants, loans, and guarantees. 96% of Finnish deep tech companies have had some type of Business Finland funding

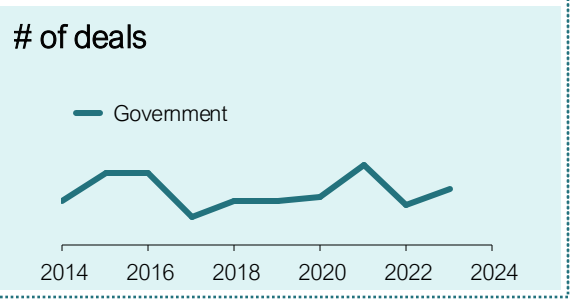
Tesi

Tesi is a Finnish government owned venture capital and private equity investor, including both VC/PE fund and direct VC/PE investments. Tesi is an investor in many Finnish deep tech companies.

European Investment Bank

European Innovation Council

EU is hugely important source of funding for Finland's deep tech ecosystem. EIC alone has invested hundreds of millions since 2014 to Finland, deep tech having significant amount of the total. EU funding is especially important in later stage, where funding options are narrower.

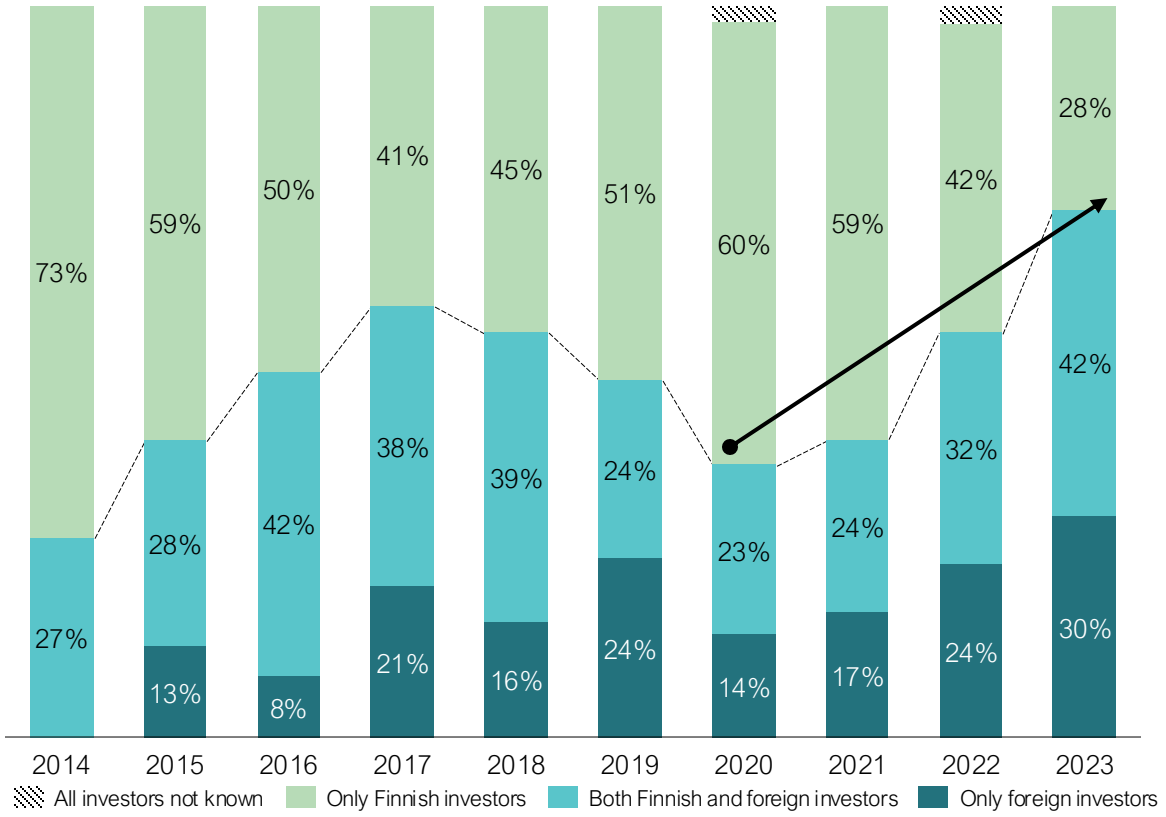


[1]Company material
[2]Tesi's data model, Pitchbook investor data

The role of foreign investors has been on the rise, while funding syndicate structures have remained quite similar

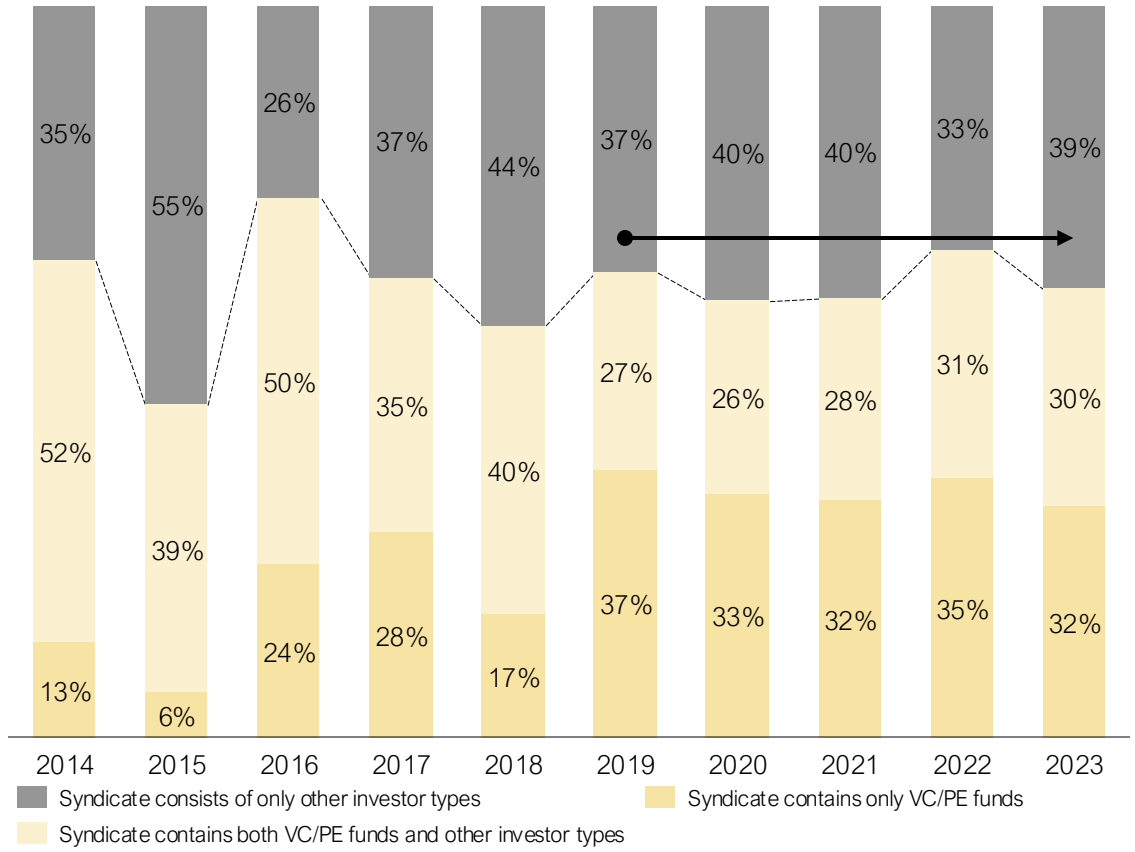
Syndicate geography distribution by year, 2014- 2023[1]

% of deals



Syndicate type distribution by year, 2014- 2023[1]

% of deals



As larger rounds have become more common, the role of foreign investors in the ecosystem has increased. Meanwhile, the spread amongst investor types have remained relatively stable in recent years

[1]Tesi's data model, Pitchbook investor data


Growth of the Ecosystem

Comments from the Market

Voima Ventures

Voima Ventures is one of the leading VCs focusing solely on deep tech across the Nordics. Voima has supported companies such as Solar Foods, Dispelix, Kuva Space and SemiQon.

Finland has a decades long history of high quality basic and applied research, which has yielded into several deep tech and other business success stories over the years. A notable part of Finnish deep tech companies are originally spin-offs from Finnish universities and research institutes such as VTT, where many of the ground-braking innovations and high-caliber founder teams are born.

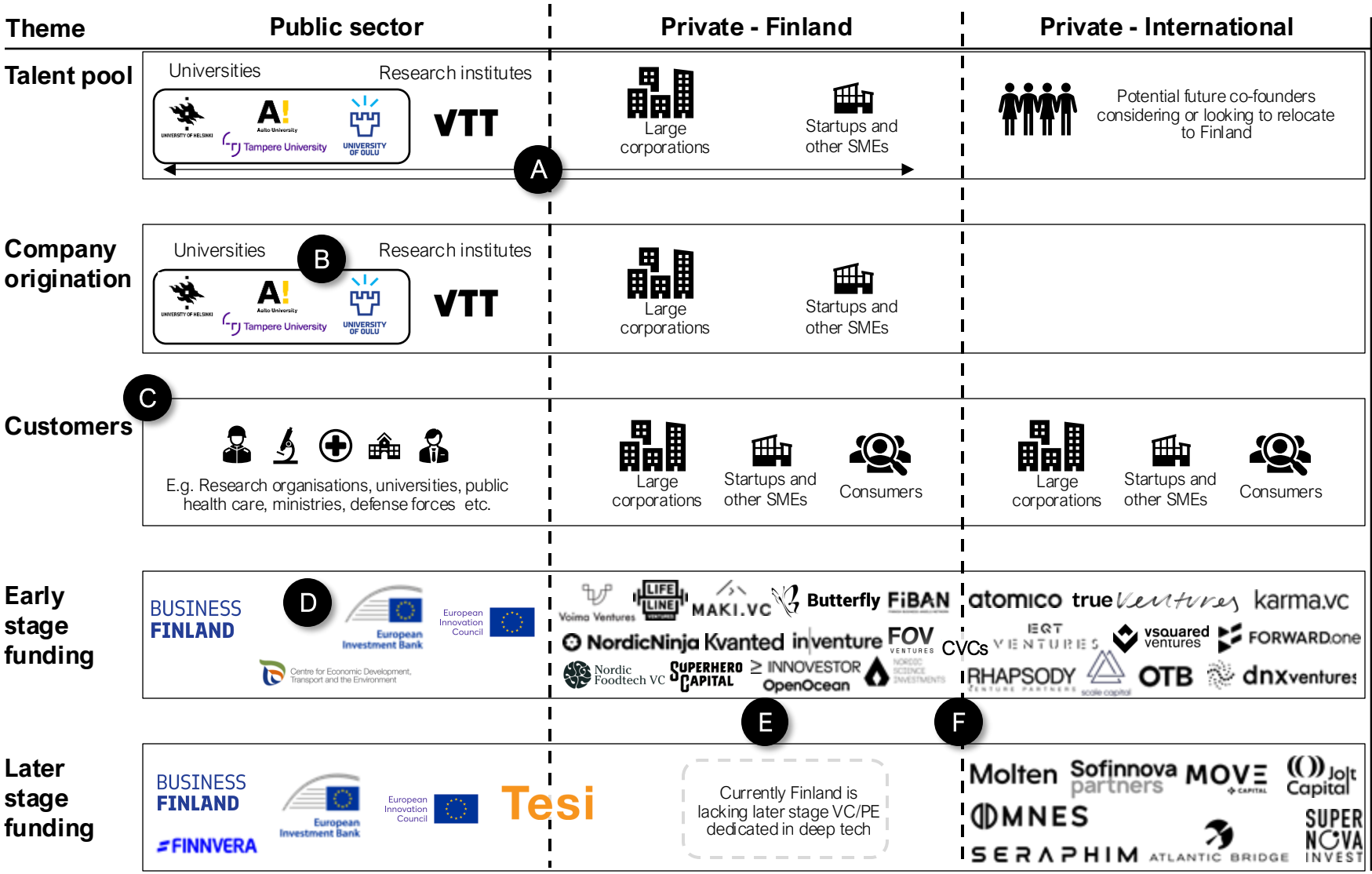
Basic foundation for spinning off a business from a university or a research institute in Finland is in place and there's availability of public funding for the "research-to-business" cases. However, room for improvement exists. More efficient models to facilitate establishment of new spin-offs should be investigated bringing together science, growth entrepreneurship and venture capital. The amount of new Finnish deep tech companies being founded is far from its potential and improved processes could definitely help bring the numbers up.

As we know, the capital requirements for scaling a deep tech business are high. At the same time, the local availability for later stage funding in Finland lacks clearly behind the European peers. Combining private investments with suitable public funding provides a necessary backbone for a deep tech company to breakthrough as an international category leader.

If the different parts of Finnish deep tech community continue to develop and co-operate well, we are likely to see several top-performers to become globally leading companies in their field, and creating new jobs, attracting international talent, generating expertise and wealth for the whole ecosystem.

Jussi Sainiemi, Partner

The Finnish ecosystem around deep tech companies in a nutshell



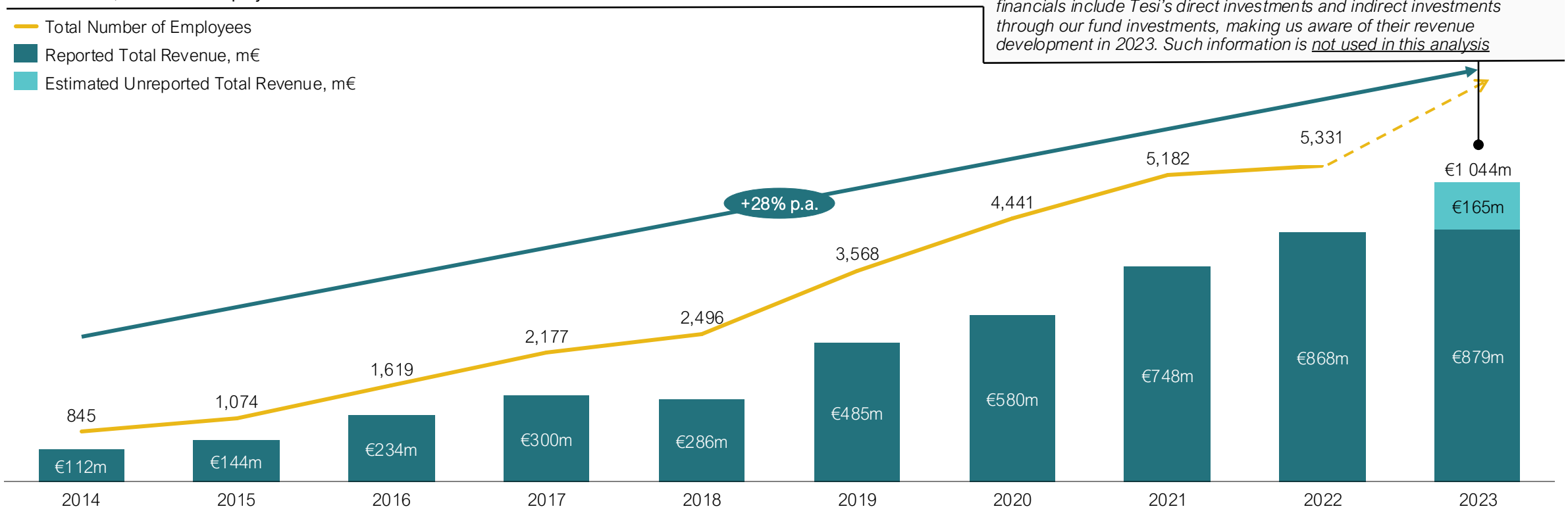
[1]Statistics Finland

The total yearly revenues by Finnish deep tech companies exceeded the €1bn mark in 2023

- The growth of Finnish deep tech is driven above all by phenomenal growth amongst our most successful scaleups. Companies like Oura, Bluefors, Iceye and others are growing at astronomical speed, fuelling the growth the whole ecosystem
- Since 2014, the total revenue of the ecosystem has grown approximately 28% a year. In year 2023 the total revenue increased by 20%
- The total number of employees has grown approximately 26% a year. The figure in the graph does not contain deep tech companies who have not reported financials for year 2023. By our estimate, the total figure could be somewhere between 6900 and 7000 employees at the end of 2023

Development of total ecosystem revenue and number of employees, 2014-2023[1]
million euros, number of employees

The shown estimated unreported revenue is likely lower than the actual revenue will be for those companies, as the companies yet to report 2023 financials include Tesi's direct investments and indirect investments through our fund investments, making us aware of their revenue development in 2023. Such information is not used in this analysis

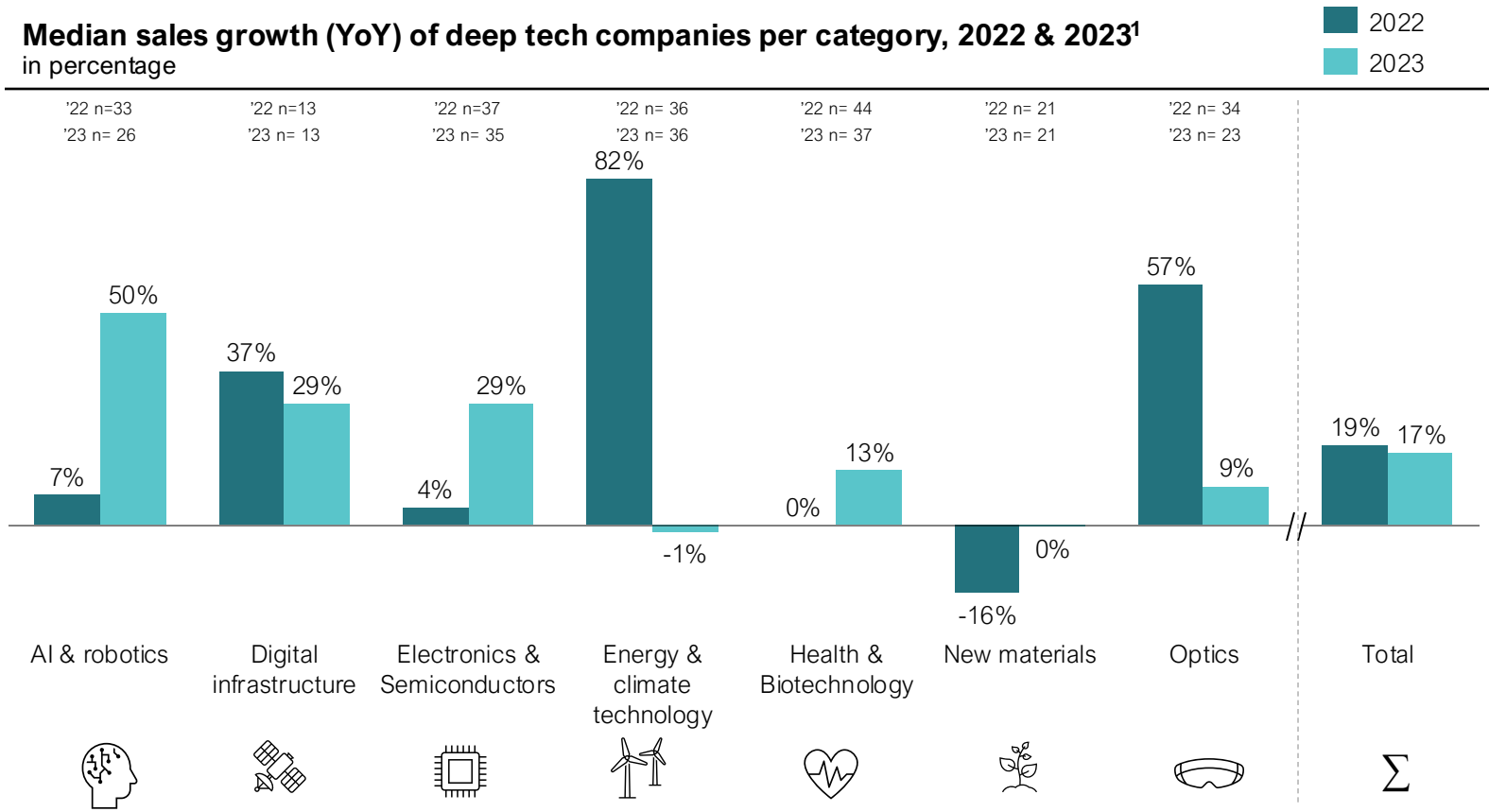


1: As of 4 November 2024, for companies with out reported financials yet, the estimated sales and number of employees in 2023 is based on the median sales growth and personnel growth of the deep tech companies that have published financials for 2023

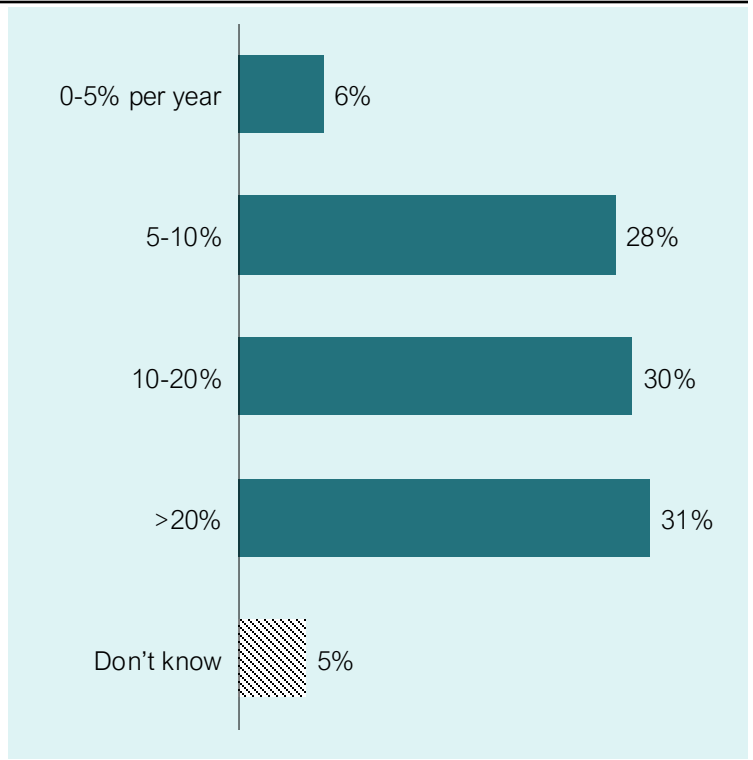
Moderate growth continued for deep tech companies in 2023, lead by AI & robotics

- The growth measured by category median sales growth is lead by AI & robotics, digital infrastructure, and electronics & semiconductors. The sample size per category is limited, leading to volatility in the data shown.
- Optics companies experienced less aggressive growth in 2023, while the average growth in Energy & climate technology and New materials was flat or negative.
- Energy & climate technology, digital infrastructure, and optics companies on average estimate higher market growth than companies in other categories. The sample size per category is small, thus, such analysis should be taken with a pinch of salt.

Median sales growth (YoY) of deep tech companies per category, 2022 & 2023[1]
in percentage



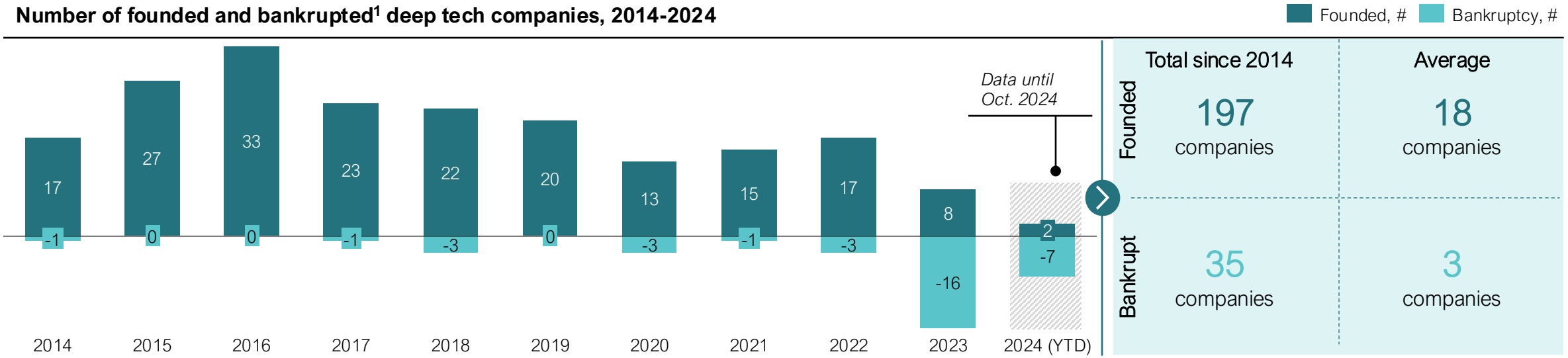
Market growth for deep tech companies[2]
Average yearly SAM growth (Serviceable addressable market)



[1]Tesi's data model, no adjustment conducted to account for missing data
[2]Tesi's deep tech company survey (n=79)

The net number of companies founded is approaching a worrying trend, reasons behind the phenomena are multifaceted

Number of founded and bankrupted[1] deep tech companies, 2014-2024



Observed ecosystem level issues affecting founding trend[2]

- **Funding:** Overall, seems like both deep tech companies and VC funds agree on public funding being in a reasonably good state. Especially public funding for the initial steps of a company seem to be well covered, while later stage public funding options and EU funding in general are pointed out as the areas in need of development by Finnish deep tech entrepreneurs and executives.
- **Research organisations:** High quality basic and applied research are conducted in Finnish universities and research organizations. The fundamentals of research organizations seem to be in place, however, many feel the spin-off processes could be less complex and more dynamic.
- It is hard to pin point a single reason for the low level of new companies founded. The macroeconomic situation of past few years probably plays a part, however further development of public funding and spin-off processes could help increasing the deep tech company ”net birth rate”.

Observed ecosystem level issues affecting bankruptcies

- One clear ”upstream” reason we see for the increased bankruptcies has been the difficult fundraising environment. The number of funding rounds for Finnish deep tech companies has been clearly declining since 2022. At the same time, ~60% of funding rounds are taking more than 6 months’ time to close[3].
- While investment volumes in terms of euros raised have moderately recovered in 2024, the decline in the number of investment rounds means less businesses are getting the funding they need in order to sustain sufficient operations.
- Meanwhile, the challenging macroeconomic environment has tightened budgets at large corporations, likely reducing their spending on new technologies and limiting capital for corporate venture investments or start-up acquisitions.
- The factors mentioned above, combined with the usually high cash demands of deep tech businesses, have likely contributed to the rise in deep tech bankruptcies over the past couple of years.

[1] The figure includes both involuntary bankruptcies and voluntary dissolvement of businesses
[2] Synthesis of deep tech company survey, VC fund interviews and Tesi analysis. The number of founded companies includes business with established legal entity.
[3] Tesi’s survey of Finnish Deep Tech companies (2024)

Key growth hindrances for deep tech companies, a company and investor view

Early steps of building a deep tech company

Investor view - What do we and other VC funds see

Company view – Where are the most notable bottlenecks as seen by deep tech companies[1]

Technology validation
Building technological roadmap and IPR

- From investors point of view, the company first needs to define the technological roadmap i.e., the path towards product/technology with potential market demand. Building IPR, at early stages can protect the company, and increase the exit potential of the business.
- Deep tech companies are quite good at solving the problems at hand i.e., solving current technology and science related problems, however, strategic planning and building a viable commercial roadmap should not be neglected, as the commercialization path is one of the critical areas the next potential investors are going to look at.

Initial customer discovery
Starting steps towards product-market fit

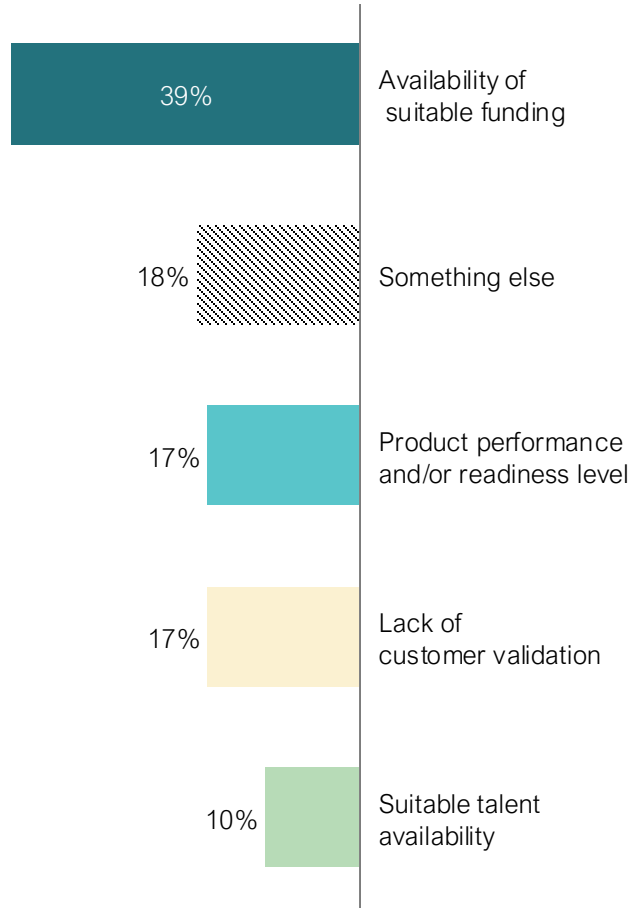
- After the technological roadmap is defined, it is critical to start customer discovery as early as possible. Initially, the feedback can come from any outside stakeholder or co-operation partner. Without feedback companies are in danger of concentrating on secondary issues.
- Initial customer discovery phase is where many investors see room for development for Finnish deep tech companies, when comparing their international peers. Investors value especially the founding teams drive in finding the product-market fit as early as possible.

- Before any larger investment round investors look for credible technology validation and market potential. VCs share the view that often the problems are in the latter part.

Commercialization / Scaling business
Finding product-market-fit

- After the tech roadmap, initial customer discovery and usually, a (pre)seed stage investment round, commercial scaling phase starts.
- This doesn't yet mean the companies are in the clear. According to investors the "valley of death" in deep tech is after the first larger investment round, as after that the company is expected to produce commercial results in order to advance to further rounds.

% of respondents in the survey



[1]Tesi's survey directed to Finnish deep tech companies (n=79)

Employment in deep tech companies has increased rapidly, while the role of PhD-level workers and foreign nationals has been notable for some time

Economist's perspective

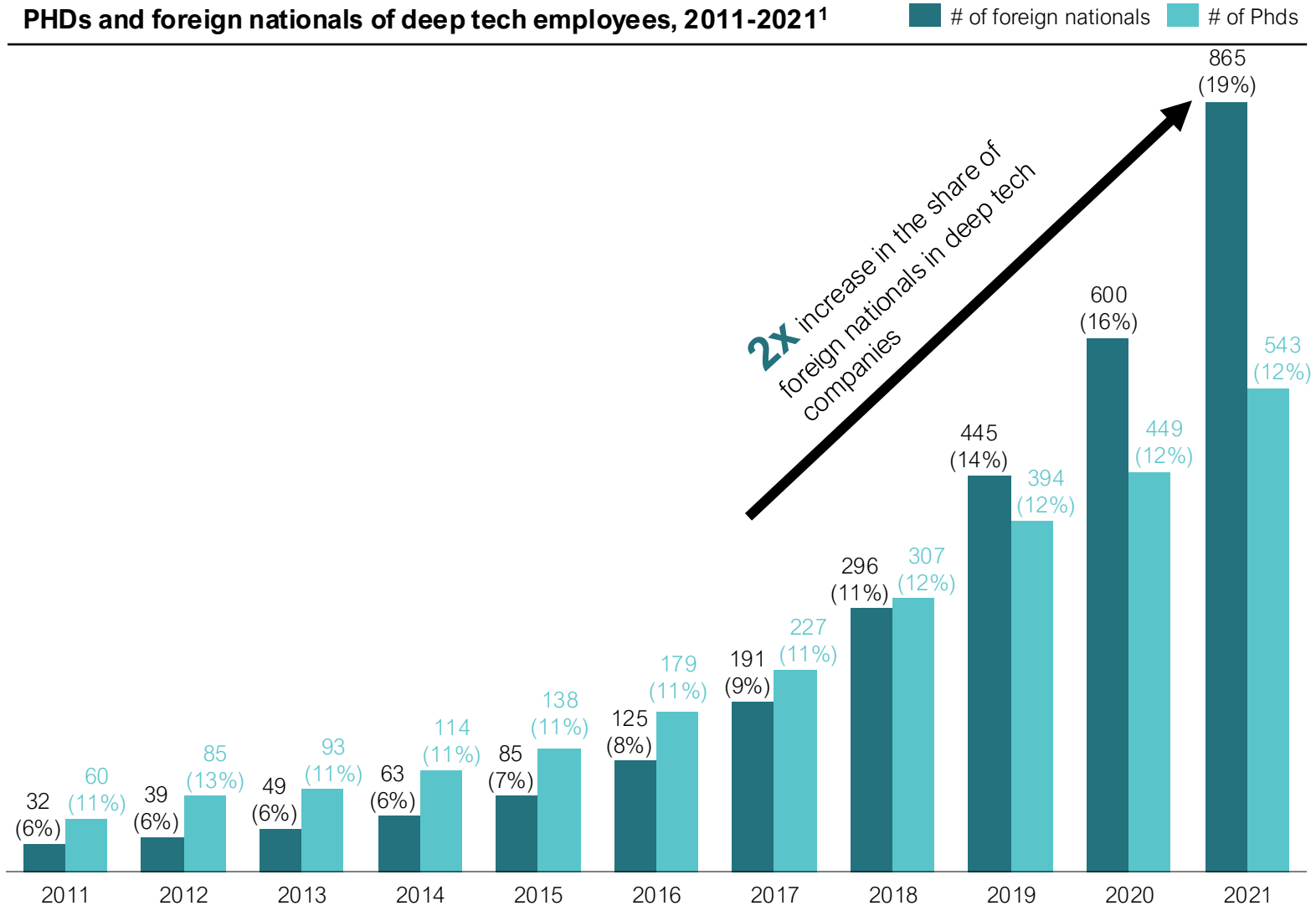
Youssef Zad

Chief Economist
Finnish Startup Community

Finnish Startup Community represents 260 startups and venture capital funds in Finland.

- Number of workers in deep tech companies has increased significantly which indicates that the economic impact of these companies is growing
- Education matters in deep tech. The share of PhD-level workers is around 11 to 12 percent.
- Deep tech companies in Finland employed almost 550 PhD holders in 2021. We should invest in education heavily to ensure these innovative companies have enough skilled workers in Finland.
- The role of immigrant workers has increased astonishingly fast after 2015. The share of employees that are foreign nationals doubled between 2015 and 2021.
- Finland should definitely ensure that we are a country that welcomes labour-based immigrants with open arms!

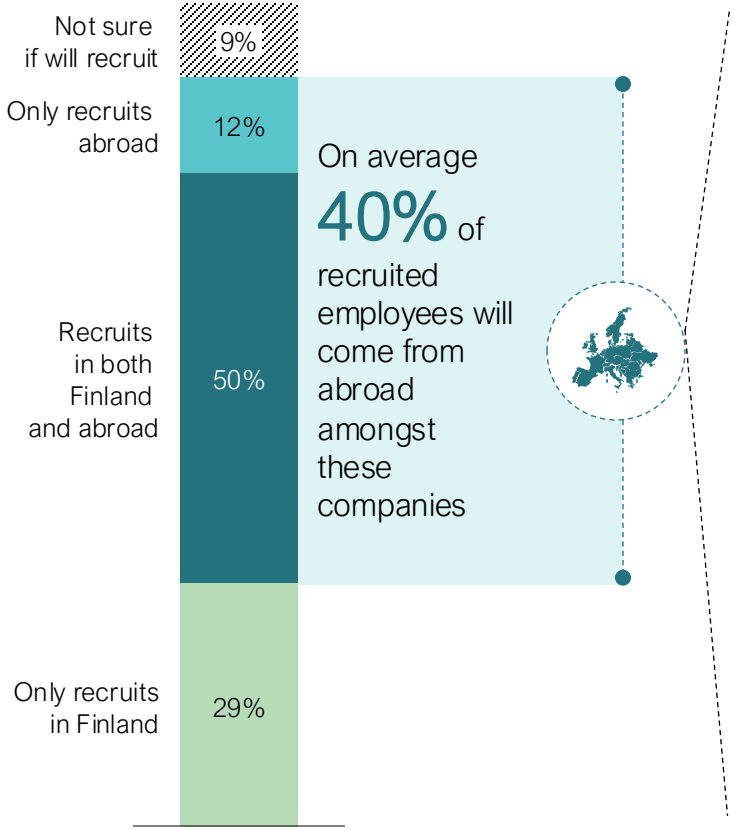
PHDs and foreign nationals of deep tech employees, 2011-2021[1]



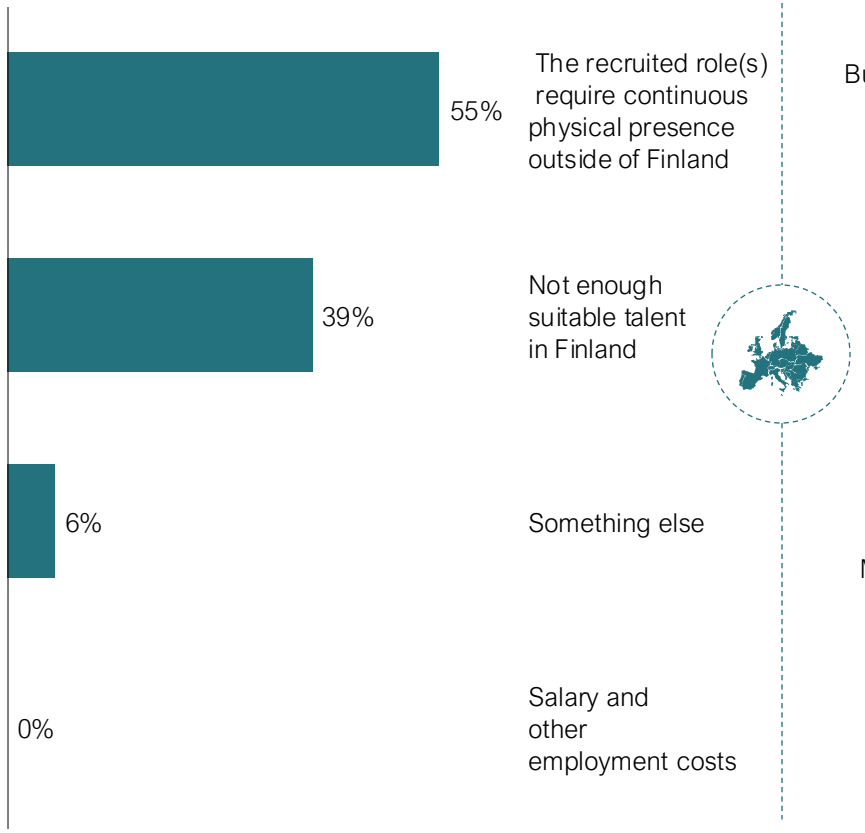
[1]Statistics Finland, Finnish Startup Community analysis

No signs of slow-down in recruiting plans, talent acquisition from abroad in a significant role

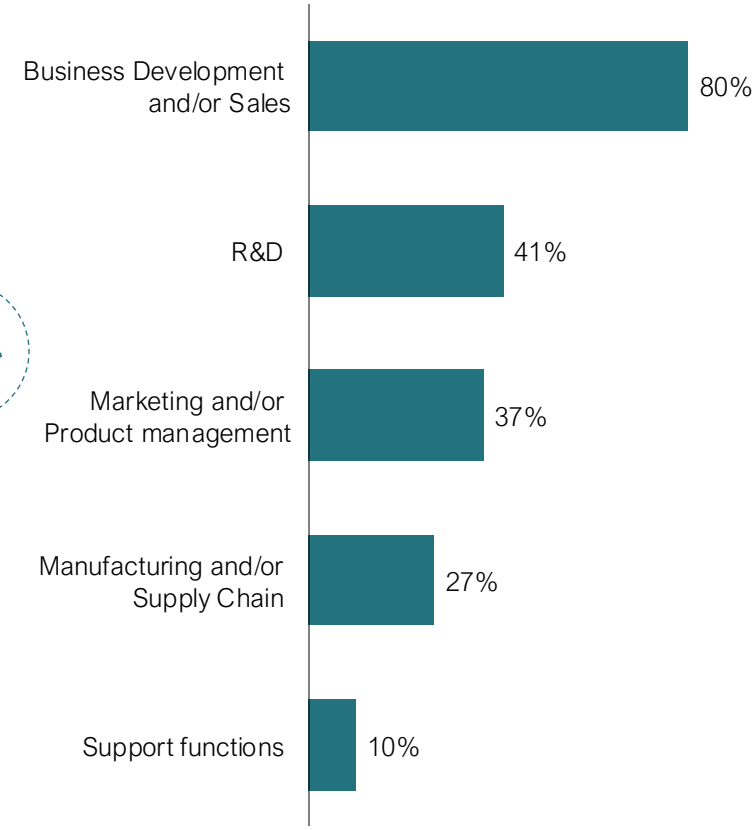
Recruitment plans of deep tech companies[1]
% of survey respondents, next 12 months



Most important reasons to recruit from abroad[1]
% of survey respondents, next 12 months



Most important roles recruited from abroad[1]
% of responses (multiple choice), next 12 months



- While our pool of surveyed Finnish deep tech companies is non-exhaustive, we see couple of themes appearing, which might resonate for the whole Finnish deep tech ecosystem
- Recruiting international sales staff outside of Finland is understandable. However, 75% respondents that are focusing on R&D recruitments claimed Finland might lack suitable talent for their needs
- Only 9% of surveyed businesses are currently unsure whether they will increase their headcount next year, which reflects at least mild optimism regarding the business outlook in 2025
- Salary levels do not seem to be a reason for not recruiting to Finland. While this is partly good news, can it be a competitive disadvantage in attracting top-tier talent to the Finnish ecosystem?

[1]Tesi's survey directed to Finnish deep tech companies (n=79)

What to improve to enable a step-change in the ecosystem?

Finnish deep tech ecosystem has many good qualities to it: the quality of research is high, the society is stable, public funding is in a relatively good state, the Finnish vc/private equity scene has multiplied in the last ten years etc. Seems like deep tech companies as well as the investors are overall quite satisfied with the fundamental building blocks of the ecosystem. Finnish deep tech is in a quite good state, as we have observed major positive development during the last 10 years in the ecosystem.

However our opinion (aligned at some points with the investor's views) is that we all need more ambition to take the ecosystem to another level.

Comments

A Duration from innovation/idea to starting a business needs to shorten. We produce less companies than the potential would allow.

B We need more companies with high ambition from the start, aiming for large markets and towards larger disruption

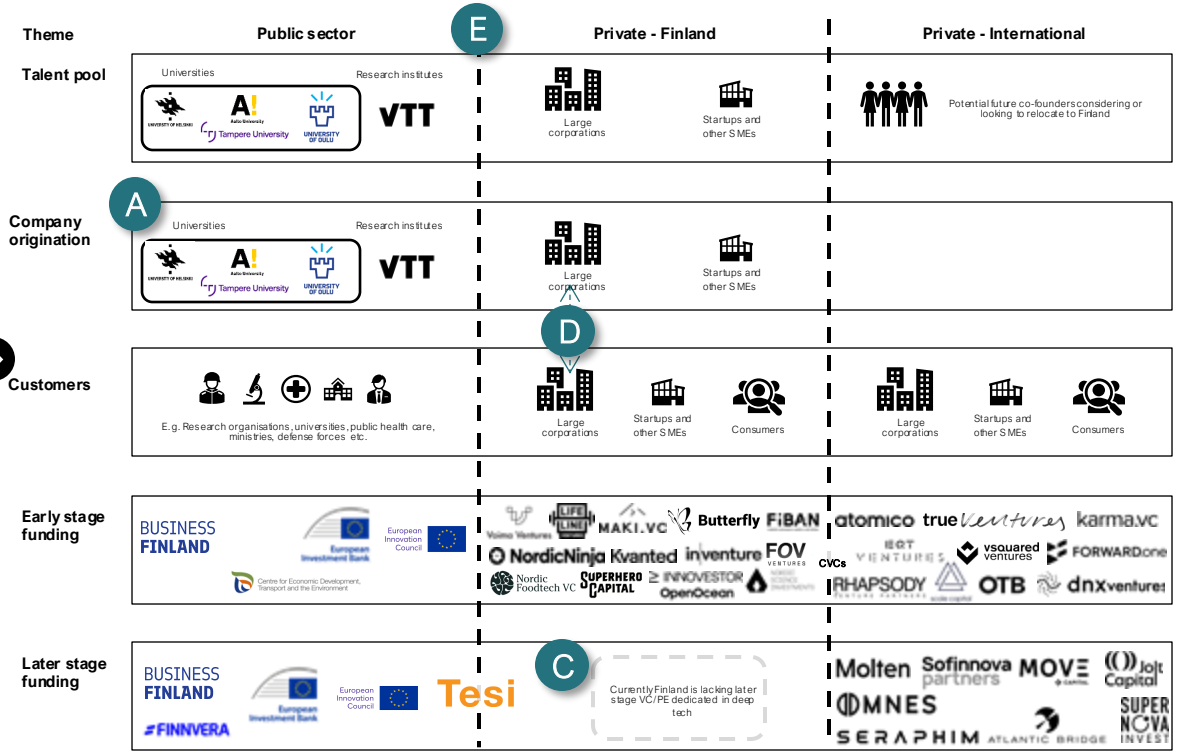
C We need later stage focused funds capable of leading larger financing rounds

D We need to find ways to activate domestic large corporations to be more active participants in the ecosystem

E The government needs to ensure efficient interaction between public and private organizations. Moreover, hugely imporant EU funding needs development of new instruments suitable for the finnish enviroment. Using current EU-funding instruments is unnecessarily labour-intensive for many companies. Coordinated effort accross public funding organizations with EU could provide results with significant impact

Finnish ecosystem around deep tech companies in a nutshell

Non-exhaustive




Exits

Comments from the Market

Lifeline Ventures is a sector agnostic early-stage venture capital investor, having backed companies like Oura, ICEYE and Minima Processor (acquired by Robert Bosch in 2022)

Deep tech innovations are inherently disruptive, typically driven by a strong technology and intellectual property (IP) portfolio. Due to the long development timelines and significant capital requirements, the deep tech exit landscape often follows a binary pattern.

Deep tech companies are frequently acquired at an early stage, before scaling their commercial operations significantly. Positioning for this "first exit window" can yield attractive returns for teams and investors. Reaching even this stage usually requires several rounds of financing and takes years, as these exits are rarely swift. Also, the notion that "companies are bought, not sold" doesn't fully apply here—systematic promotion to potential acquirers is necessary.

Truly significant outcomes can emerge in the "second exit window," after the company has raised substantial capital, validated its business model, and demonstrated financial value. This path is particularly challenging, as it involves navigating tough sector dynamics and competing against well-capitalized incumbents.

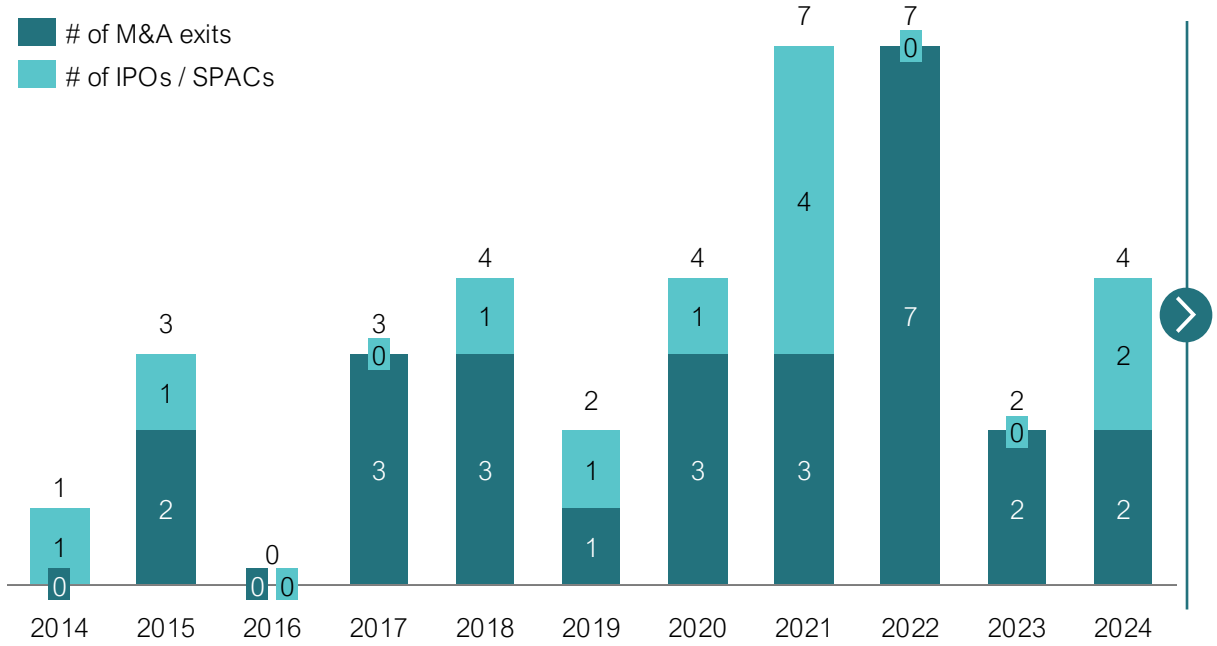
For Finland, it is essential to foster companies willing and capable of pursuing this second window. We need to cultivate new anchor companies with deep tech foundations, which can eventually lead to IPOs or, even if sold to strategic acquirers, retain substantial R&D and manufacturing activities in Finland.

Fortunately, several Finnish startups are already on this path. As Finnish investors, we must build tools to support them – including funds that can support sizable capital needs these companies have.

Juha Lindfors, Partner

The Finnish market hasn't yet seen many large deep tech exits, however, the market is alive and the foundations for a positive change have been created

IPOs and M&A exits[1] since 2014



26 M&A exits and **11** IPOs or SPACs during the past 10 years

7 IPOs, SPACs or M&A exits of **€100**m or more in deal value

- As showed earlier in this report, both the business volume and the number of Finnish deep tech companies has taken notable growth steps inside the last ten years. Thus, it is unsurprising the number of Finnish deep tech IPOs or M&A exits has been quite low until the 2020s and yet to grow to a large yearly volume.
- It takes a while to develop a deep tech innovation to commercial success and this is also reflected in the average time from a Finnish deep tech company foundation to IPO or a trade sale (M&A exit), 12.0 years[2]. The presented average number might even be a bit optimistic, because some of the Finnish deep tech exits this far might have happened before the company had the chance to fulfil its commercial long-term vision.
- On a positive note, more Finnish deep tech companies are growing into larger size. This could lead into more Finnish deep tech exits of high valuation happening in the future. However, an exit isn't the only way, andwith a solid funding base, these deep tech companies could keep growing independently without being sold too early.

Selected transactions

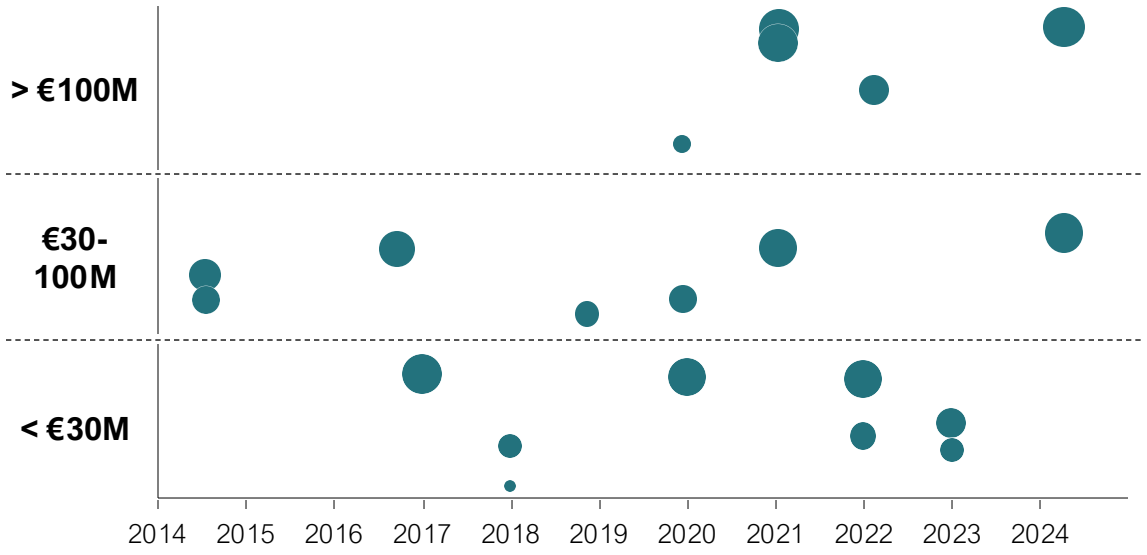
Company	Category	Founded	Exit year	Exit type	Buyer
Detection Technology	Optics	1991	2015	IPO	
SPECIM SPECTRAL IMAGING	Optics	1995	2020	M&A	Konica Minolta
MOBIDIAG	Health & Biotech	2000	2021	M&A	Hologic
aiforia	AI & Robotics	2013	2021	IPO	
Minima	Electronics & Semicon.	2016	2022	M&A	Robert Bosch
picosun	Electronics & Semicon.	1997	2022	M&A	Applied Materials
SILO AI	AI & Robotics	2017	2024	M&A	AMD Global
CANATU	Electronics & Semicon.	2004	2024	SPAC	

[1] By a M&A exit, we mean a trade sale of a company to another entity (n=24) or a buyout acquisition by a private equity fund (n=2).
[2] Based on Tesi analysis on all recorded deep tech trade sales, IPOs and SPAC transactions since 2014.

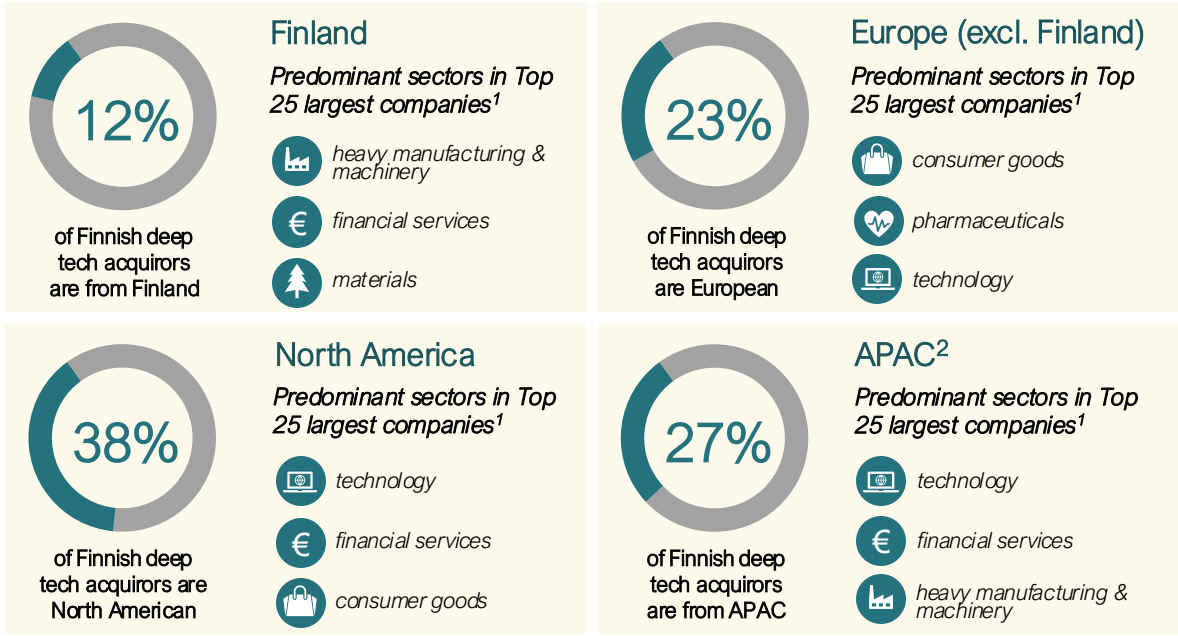
Majority of Finnish deep tech exits through M&A have historically occurred at an early stage, often to large international corporates

Exits through M&A in the Finnish deep tech landscape 2014-2024

Companies with undisclosed deal sizes are excluded from this analysis.



Previous and potential future acquirors of Finnish deep tech



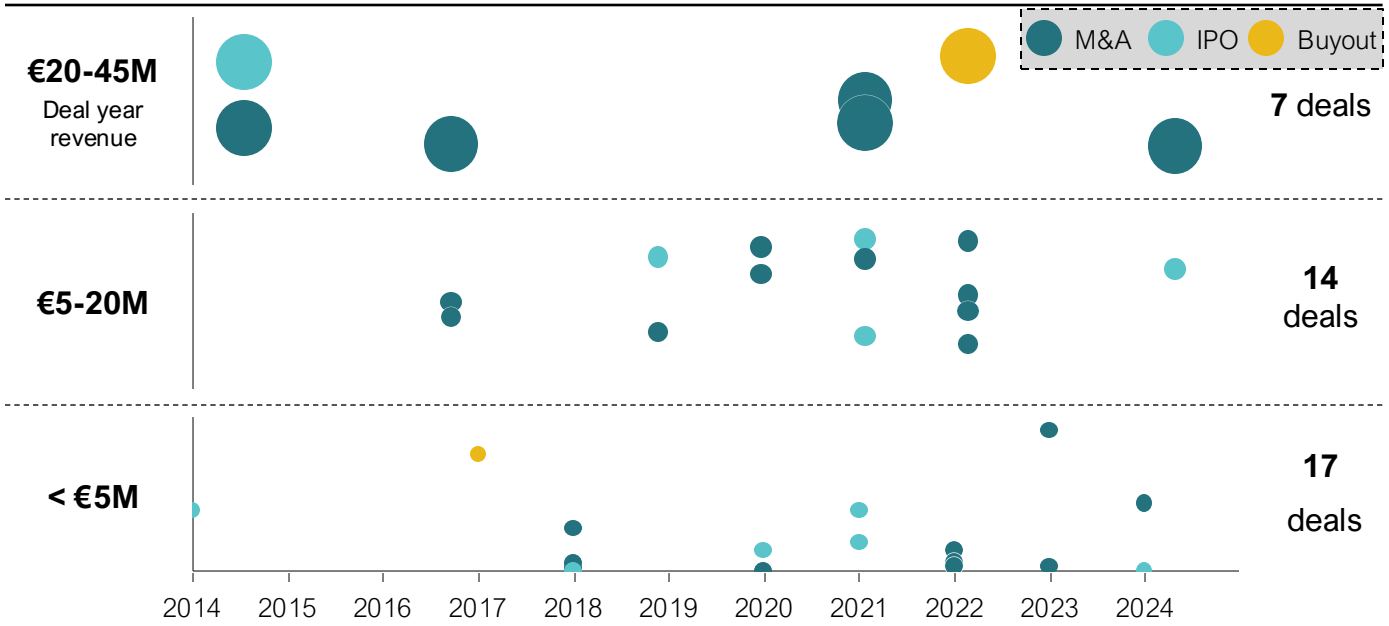
- Why are M&A exits important in the first place? While IPOs are a great exit avenue for some, not all businesses are keen or have the resources to go through the needed preparations for an IPO, or simply have appetite for the market risk that comes with it. M&A exits often also provide liquidity to the investors and co-founders faster, which may mean lifechanging cash increase for the co-founders, great returns and improved fund performance metrics for VC or other fund investors.
- An exit through M&A on the other hand means less independence as opposed to an IPO or continuing private. Only a limited number of Finnish deep tech companies have been sold for more than €100m to date. Depending on e.g. the difference in size between the acquired company and acquiror, the acquired company may have limited influence on the overall business strategy of the acquiror. This factor may partly explain why acquired Finnish companies sometimes reduce their footprint in Finland post-acquisition.

- Historically, Finnish corporations have accounted for a small fraction of the acquisitions of Finnish deep tech companies. While there are obvious reasons for this, such as the market size or relatively small pool of applicable acquirors, we still see possibilities for more deep tech acquisitions by Finnish companies in the future.
- Currently, many of the Finnish deep tech companies operate in different industries from where the large Finnish corporations operate in, which makes most of the large Finnish corporations unlikely acquiror candidates to these deep tech companies (apart from companies in few selected verticals).
- However, several Finnish deep tech companies have already grown to a notable size, and more is to come. Thus, in the future we hope and expect to see the group of large Finnish companies being more industry-diverse, making them suitable acquirers for a broader range of disruptive companies.

[1] Based on the most common industries in Top 25 largest companies measured by Market Capitalization amount, as reported by Capital IQ, 30/10/2024
[2] Acquirors from the APAC region are from China, Japan, South Korea and Taiwan

Exit considerations and a brief look forward

Exit year revenue for IPOs, M&As, and buyouts, 2014-2024



Different exit windows and the related implications

- Deep tech businesses often have at least two "exit windows", the first being considered "a technology exit" based purely on the strength and promise of the technology, IP and the team. The second exit window is open later in the growth path when commercial scaling and financial performance have been validated. Deal values in technology exits can be very binary, but companies in the second exit window often have stronger leverage due to better financial position, presenting an opportunity for a true landmark deal.
- More than 80% of Finnish deep tech exits have been done before the company has reached €20m in revenue, but we hope to see more Finnish deep tech businesses reaching the second exit window, where large scale M&A exits or IPOs are within a reach, and the companies can then decide whether to pursue further growth independently or within a larger entity.
- Whatever may be the decision for each company, the benefits of larger exits will feed both into the Finnish deep tech ecosystem and economy overall.

Going forward

- The macroeconomic environment as seen from Finland is showing some glimpses of optimism in the future, however a speedy switch to hyper-active bull markets together with over-heated M&A / IPO markets isn't likely in the near-term horizon.
- The changed geopolitical environment is impacting deep tech exit planning globally and is likely to do so for some time
  - Within deep tech, there are several technology verticals that are closely linked to critical infrastructure, and therefore to strategic supply security or national security overall.
  - We expect governments to monitor the acquisitions of local critical technologies even more closely than before. U.S government has blocked acquisition attempts from certain geographies in increasing manner during past few years[1].
  - This can narrow the list of potential M&A exit avenues at least in the short to midterm and can add complexity to a M&A process for companies operating in these nationally strategic fields.
  - We will see whether this will lead into more companies favoring IPO as an alternative to trade sales in the coming couple of years, at least in the industries of nationally strategic nature.
- The IPO market overall has been very quiet for the past couple of years. Many of the IPO experts[2] are now signalling cautious optimism for IPOs in the future. Should the IPO market revitalize, we could see a handful of Finnish deep tech companies starting the preparations, if not already started, for an IPO.
- The Finnish deep tech landscape contains a plenty of global scale success potential. By continuing the good level of co-operation throughout the landscape and addressing e.g. the bottlenecks and development areas in the ecosystem mentioned in this report, we can maximize the possibility of further success and growth for the Finnish deep tech businesses.

[1] Bloomberg (Dec. 2023)
[2] Multiple sources. E.g. Morgan Stanley, Goldman Sachs, Ernst & Young, PwC (2024)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