The Brabant Startup Ecosystem

Progress in the entrepreneurial ecosystem

Commissioned by Braventure

June 2024

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A strong Brabant ecosystem enables productive entrepreneurship

- Entrepreneurship is of great importance for regional economies. It not only creates new value in the form of new goods and services, but also challenges incumbent firms to innovate. A **strong ecosystem enables entrepreneurship**, in the form of startups, scale-ups and entrepreneurial employees. High levels of entrepreneurship contribute to regional economies through increased productivity and employment and makes regions more adaptive.

- In Brabant several organisations such as Braventure, de Brabantse Ontwikkelings Maatschappij (BOM), Provincie Noord-Brabant and multiple others are working together in **strengthening and monitoring the ecosystem and its outputs**.

- This report is a follow-up of research done in 2020 and **charts the developments of the Brabant ecosystem in the consecutive years up to 2023**. It makes use of combined quantitative and qualitative methods. We use multiple data sources to chart the developments of each ecosystem element and the realized entrepreneurial outputs. We have interviewed several ecosystem leaders and feeders to let them reflect on the changes between 2020 and 2023.

Main questions

- What are the **strengths and weaknesses** of the Brabant entrepreneurial ecosystem?
- What have been the most **important changes** in the development of the ecosystem since 2020?

Methods

- Analysis of **startup and scale-up data**.
- Analysis of multiple quantitative and qualitative **indicators for each ecosystem element**.
- Interviews with **ecosystem leaders** and feeders.

Results

- Overview of the **entrepreneurial outputs** of Brabant.
- Deep dives on each **systemic condition** of the ecosystem.
- Summary and **conclusions**.

Birch (2020). The Brabant Ecosystem – Analysis of the entrepreneurial ecosystem.

Entrepreneurial Ecosystems

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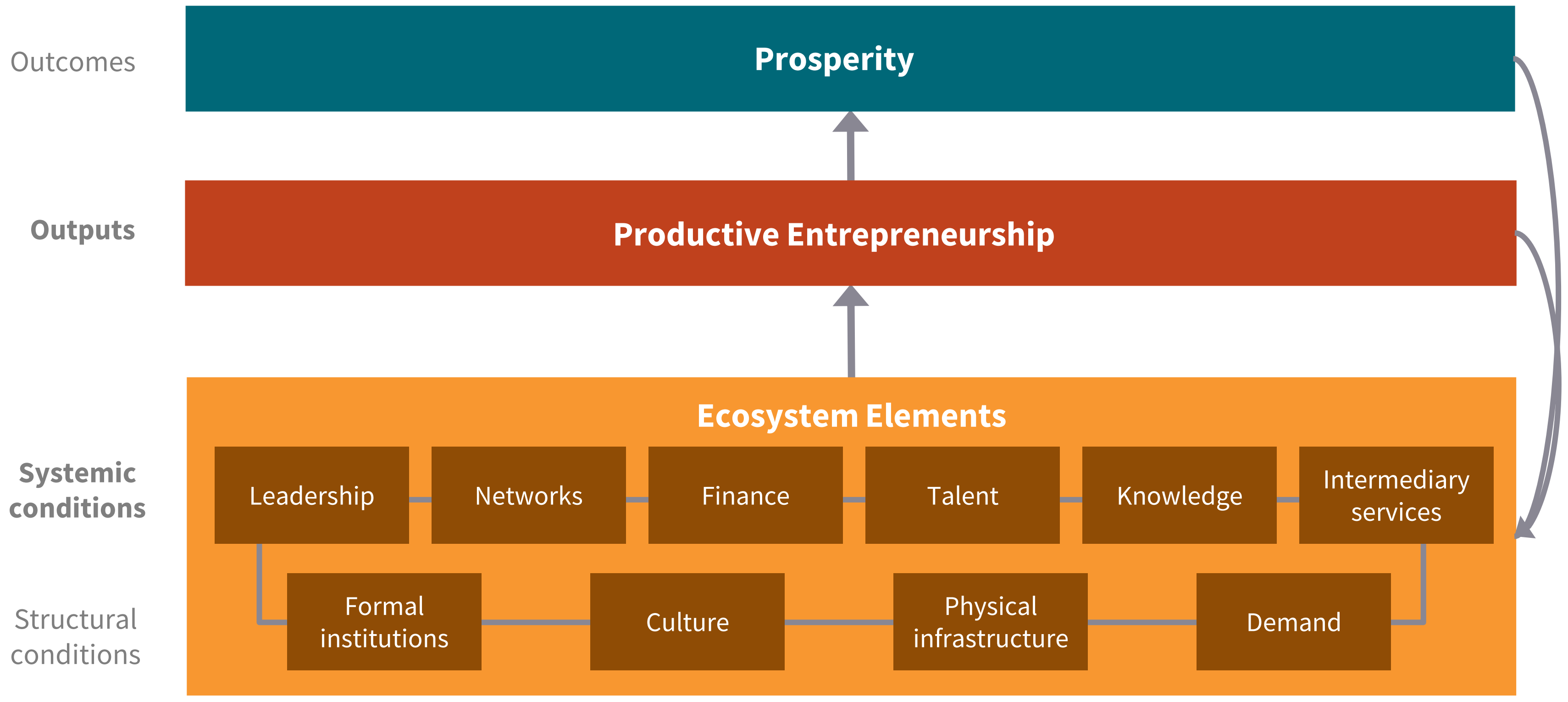
Looking at entrepreneurship through an ecosystem lens

- Strength of regional ecosystems can be measured through the lens of the *entrepreneurial ecosystem* framework. Within this framework the ecosystem is defined as an **interdependent and dynamic set of actors and elements** that make productive entrepreneurship possible.

- Entrepreneurship is defined as the process in which individuals can realize opportunities for innovation. This report aims to provide data-driven insights in both **the set of actors and elements** that make up the ecosystem as well as the outputs the ecosystem produces.

- We measure **outputs of productive entrepreneurship** with the quantity and nature (e.g. industry or technology focus) of new firms that intend to innovate and grow.



Spigel, B., & Stam, E. (2018). Entrepreneurial ecosystems. In R. Blackburn, D. De Clercq, & J. Heinonen (Eds.), *SAGE Handbook of Entrepreneurship and Small Business* Article 21 SAGE.

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The strength of the ecosystem is defined by ten interdependent elements

All ecosystem elements have their own mechanisms in which they make entrepreneurial acitvity possible, but are interdependent on one another. **Entrepreneurship in a region can only thrive when each of these elements are sufficiently in place.**

Systemic conditions	
Networks	The connectedness of businesses for new value creation. When actors in a region are well connected it allows for information, labour and knowledge to flow effectively and it helps new firms to build social capital.
Leadership	The presence of actors taking a leadership role in the ecosystem. Leadership is essential to provide the actors in the ecosystem a certain direction to work towards and make the ecosystem function more effectively.
Talent	The prevalence of individuals with high levels of human capital. Human capital is a critical input for entrepreneurship and is strongly linked to new firm formation.
Finance	The availability of capital for new firms. Capital is an important condition for starting a new firm and scaling up existing firms.
Knowledge	Investments in new knowledge. The creation of new knowledge provides new business opportunities and is therefore an important source for entrepreneurship.
Intermediaries	The presence of intermediary services. Expressed in both the presence and accessibility of intermediate business services and the presence of entrepreneur-specific services such as incubators and workspaces.

Structural conditions	
Formal institutions	The rules of the game of society expressed as the quality and efficacy of governance. It is the regulatory framework in which entrepreneurs operate.
Culture	The degree to which entrepreneurship is valued in a region. A measure to capture the regional entrepreneurial culture, consisting of entrepreneurial motivation, social norms and importance to be innovative.
Infrastructure	Physical infrastructure such as the accessibility by road, railways and flights. High accessibility makes interaction between actors more likely, which is essential for entrepreneurship.
Demand	Potential market demand. Regional purchase power and potential demand are of importance for entrepreneur as it is only possible to market products if the population has the financial means to buy them.

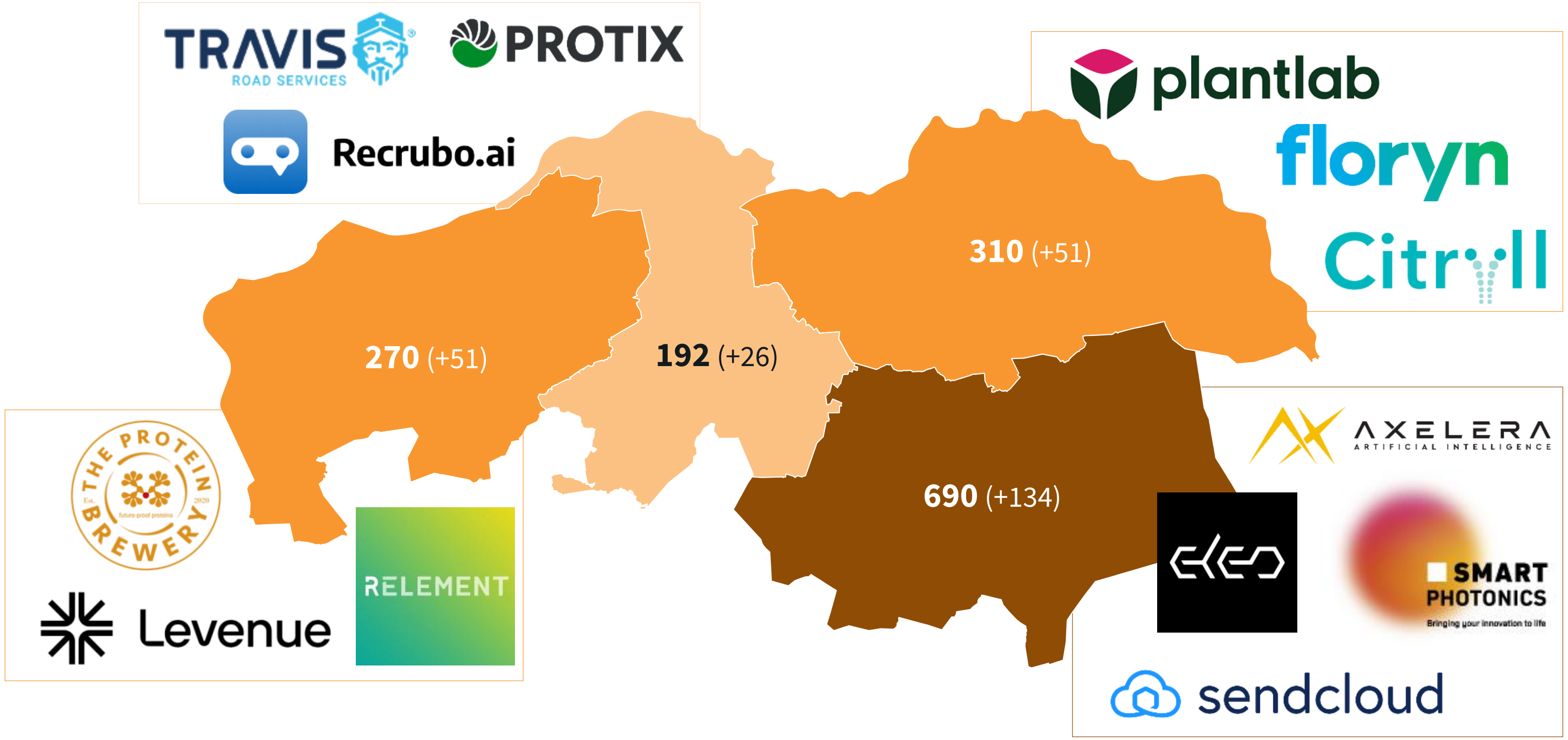
Leendertse, J., Schrijvers, M. T., & Stam, F. C. (2020). Measure twice, cut once: entrepreneurial ecosystem metrics. Research Policy, .

Overview of the startup and scale-up landscape

262 new startups launched in Brabant between 2020 and 2023

- Braventure and Dealroom have identified a total of **1.462 startups and scale-ups in Brabant**, established since 2010*.
- Between 2020 and 2023, a total of 262 new startups were launched in Brabant, indicating an **increase of 22%** in the startup population.
- The absolute as well as the relative increase in the number of startups has been **strongest in Southeast-Brabant**.

Number of startups, share of total in Brabant and growth since 2020

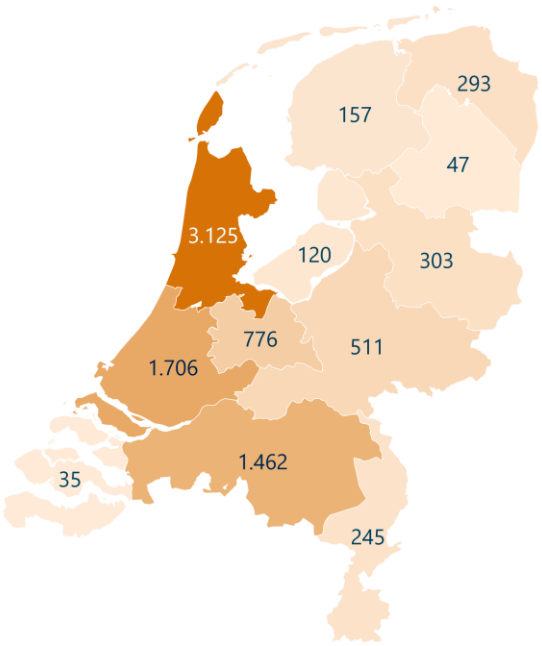


* Startup data from dealroom.co, based on 8.953 startups established since 2010. Throughout this report, the number of reported startups comprises startups established since 2010.
Note: The strong increase in number of startups between 2020 (833 startups) and 2023 (1.462 startups) is a consequence of new established startups (262) as well as improvements in the data-quality (367).

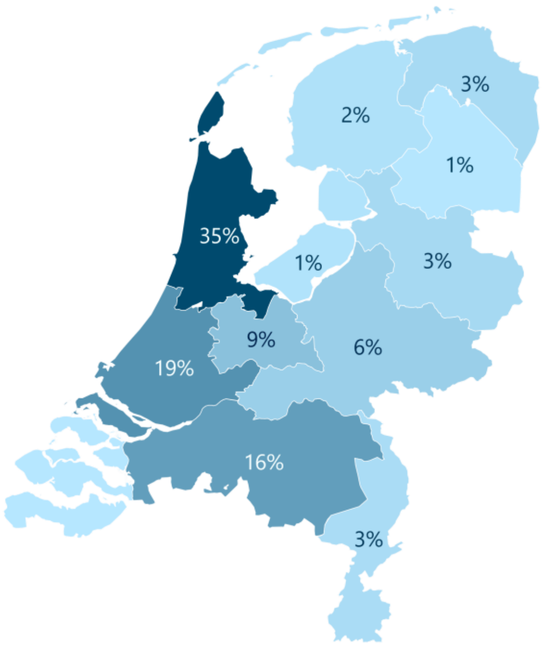
Brabant has the third largest population of startups, similar to 2020

- Brabant has the **third largest population of startups** in the Netherlands, following Noord-Holland and Zuid-Holland. The share of Brabant startups in the Netherlands has increased from 13% to 16% since 2020.
- Considering the prevalence of startups compared to the total number of firms per province, the **startup prevalence in Brabant (4,3) is above the national average (3,8)**.

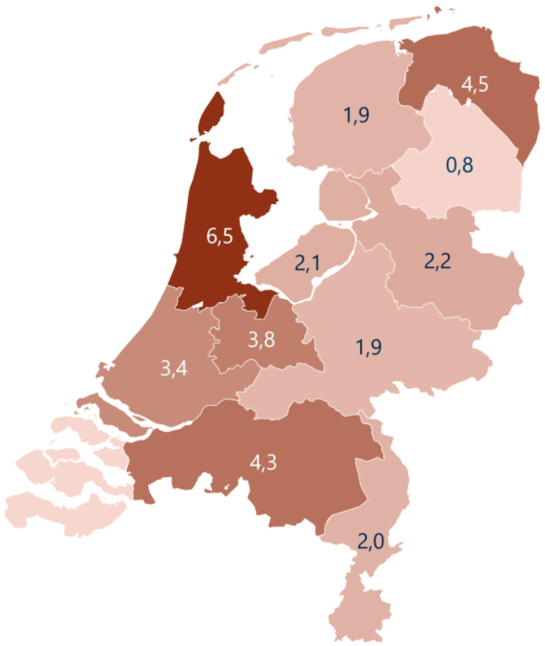
#startups



% share of startups



#startups per 1.000 firms



* Startup data from dealroom.co, based on 8.953 startups established since 2010.

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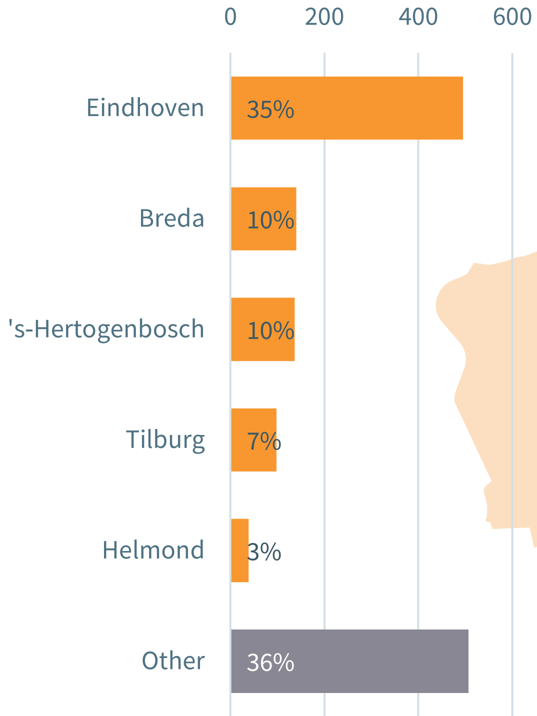
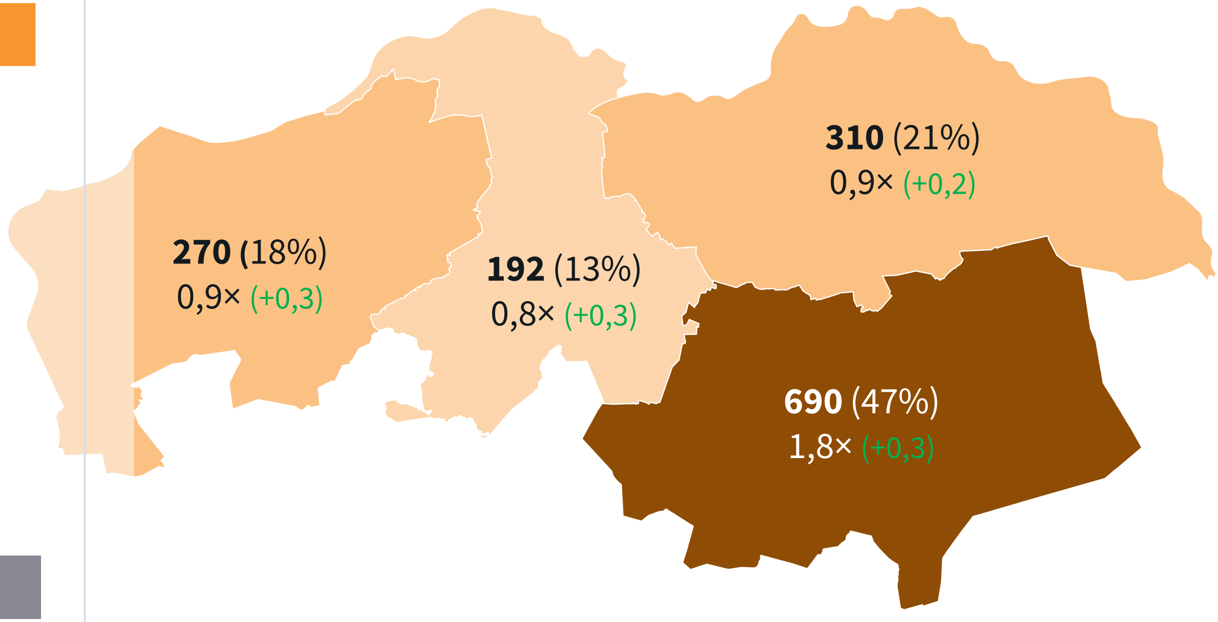
Brainport remains the Brabant startup hub, other regions are catching up

- The share of startups in Southeast-Brabant has decreased slightly from 51% in 2020 to 47% in 2023. This decrease is mainly caused by Eindhoven's share in Brabant startups, which decreased from 40% to 35%. Nevertheless, **Eindhoven and the broader Brainport Region remain the startup hub** of the province.
- **The Brainport Region is 1,8× more likely to generate a new startup** compared to the national average, based on prevalence. Brainport ranks 3rd in the Netherlands behind Greater-Amsterdam (2,7×) and Delft and Westland (2,3×).
- The other Brabant regions have all improved their likelihoods of generating a startup, **closing in on the national average**.

Top-5 startup cities



Number of startups and prevalence



* We measure prevalence by comparing the number of dealroom.co startups with the number of companies in 2023 (CBS).

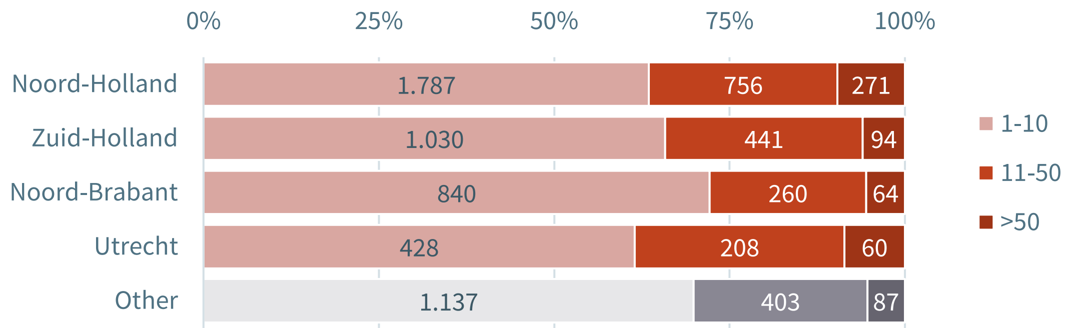
Scale-ups (1)

Proportion of scale-ups is growing, but still below national average

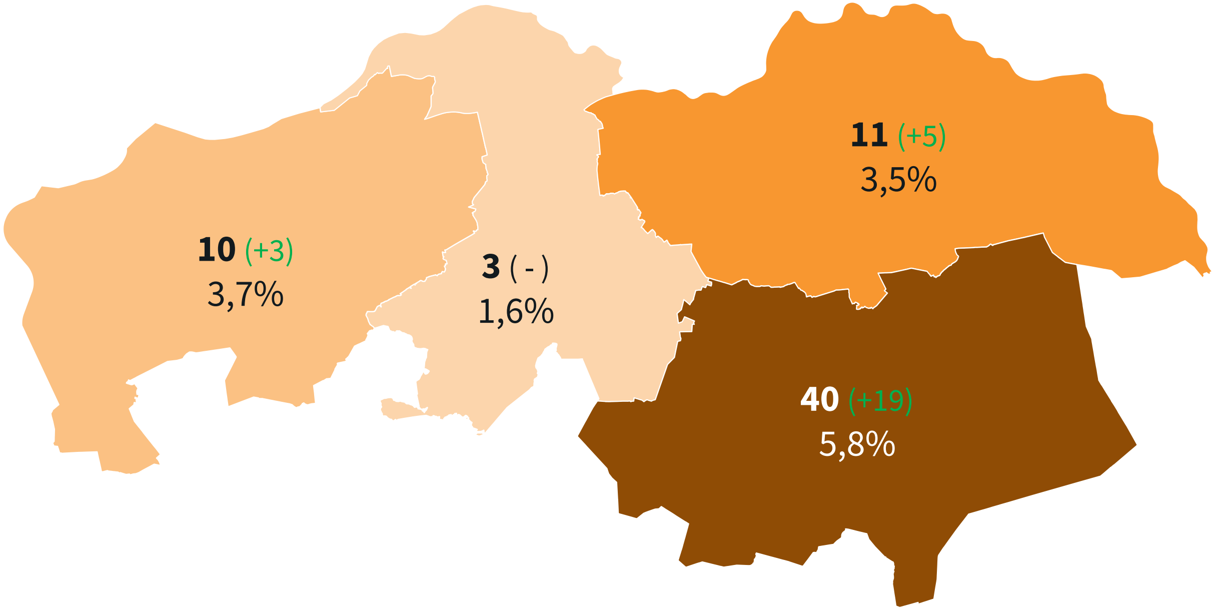
- The **size distribution of startups is comparable** to other strong startup regions in the Netherlands, although the proportion of small-sized startups (1-10 employees) is slightly larger and the proportion of middle-sized startups (11-50 employees) slightly smaller compared to other strong startup provinces*.

- 4,4% of startups in Brabant established since 2010 have managed to grow past 50 employees in size (scale-ups), **below the national average of** 6,4%. Southeast-Brabant still has the largest population of scale-up firms in Brabant and almost doubled since 2020.

Startups by size in employees



Number of scale-ups and share of total startups per region**



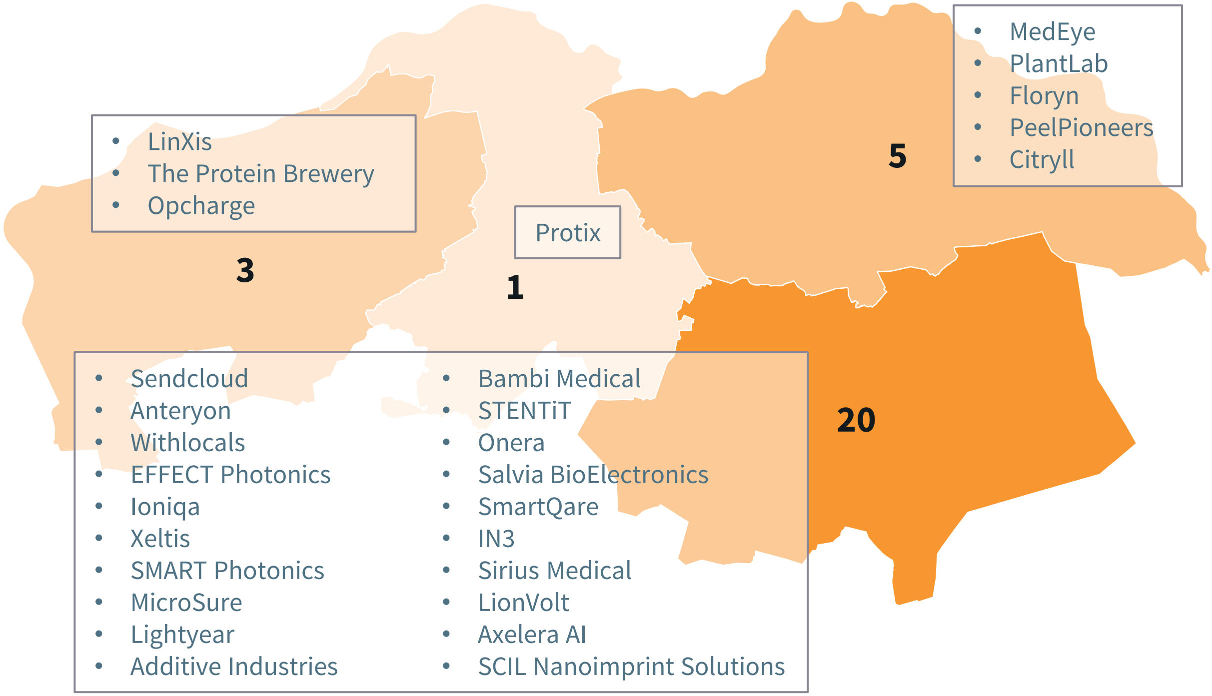
* A possible explanation for this is the data quality of startups registered in Dealroom. As Braventure detects startups at a very early stage and registers them in Dealroom, there might be an over-representation of early-stage (and small-sized) startups compared to other provinces.
** To enable comparison with the previous study, the scale-up definition used here includes all startups with more than 50 employees. This is similar to the definition used in the previous study in 2020.

Brabant has a relatively large share of funded scale-ups

- Following Techleap's definition of scale-ups*, the Netherlands has 256 scale-ups, representing 2,2% of the Dutch startup population.
- 29 of these scale-ups are in North-Brabant, representing 2% of its startup population and **11,3% of the Dutch scale-up population**.

- In total, the **Brabant scale-ups attracted almost $1,65 billion** of funding since 2010 and account for 2.290 jobs. The most prevalent industry among scale-ups in Brabant is health, with 12 scale-ups (19% of Dutch total). Nevertheless, scale-ups in semiconductors show the highest concentration, with 4 of 12 Dutch scale-ups located in Brabant.

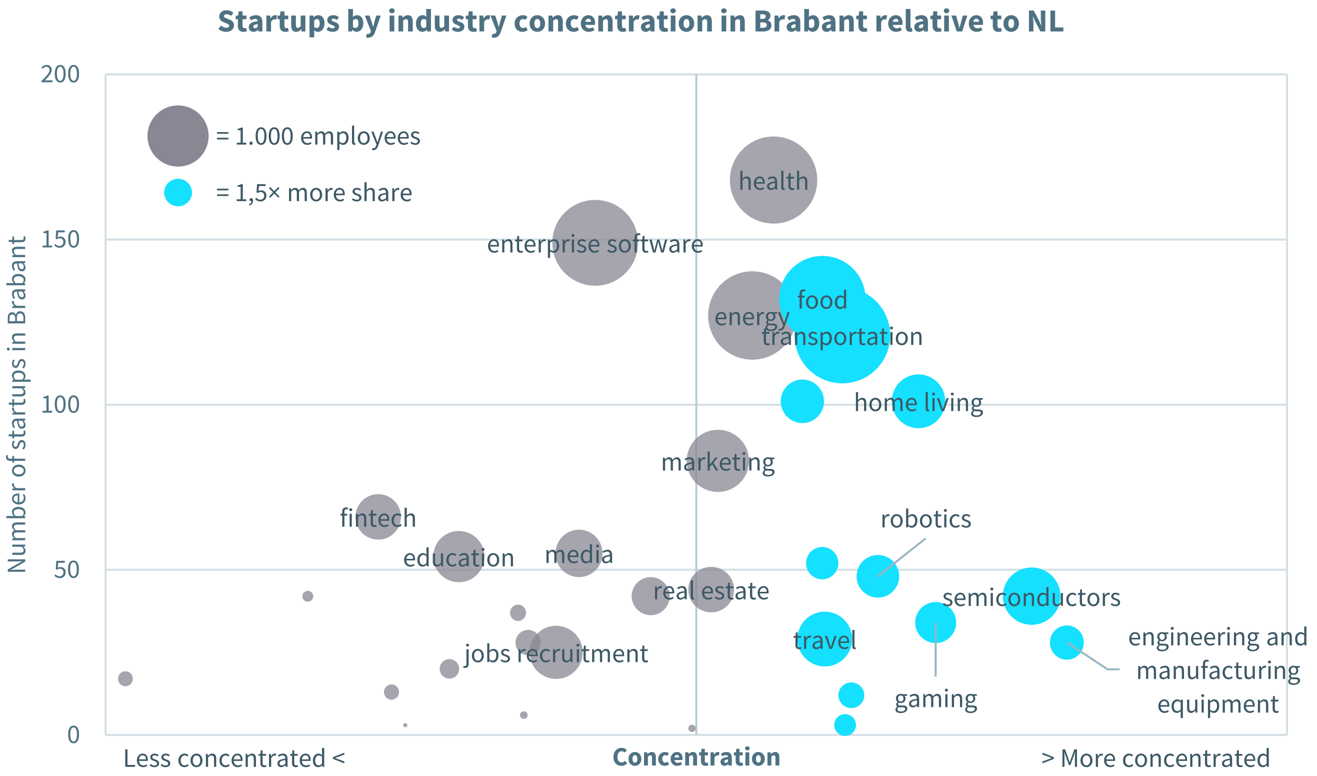
Number of scale-ups* and names



* Scale-up definition used here: "verified companies with HQ in the Netherlands, founded from 1990, whose company status is operational and that have a website. The included companies have at least 1 employee, are not subsidiaries nor publicly owned and operate within the tech domain. Non-profit and service providers are excluded. These companies have total funding above (and including) € 10m." (State of Dutch Tech 2024 Report –Techleap, 2024)

Brabant specializes in high-tech and deep tech industries

- In total 1.400 of 1.462 North-Brabant startups are categorised into one or more industries.* We look at the **concentration** for each industry in North-Brabant relative to the Netherlands, indicating the **degree of specialization** of startups in the province.
- In general, **enterprise software, health and energy are leading industries** for Dutch startups as well as for startups in North-Brabant.
- Compared to the Dutch average, startups in industries such as food, transportation, gaming, home living, engineering and manufacturing equipment, robotics and semiconductors are **overrepresented in North-Brabant**, indicating the specialization of the province regarding these industries.



Data: dealroom.co. As one startup can be categorised into more than one industry, the number of startups counted can exceed the total number of startups.

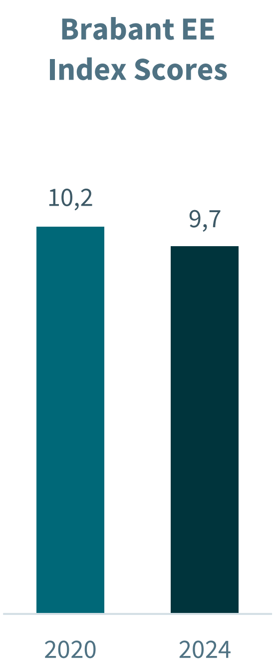
Overview of the Brabant Ecosystem

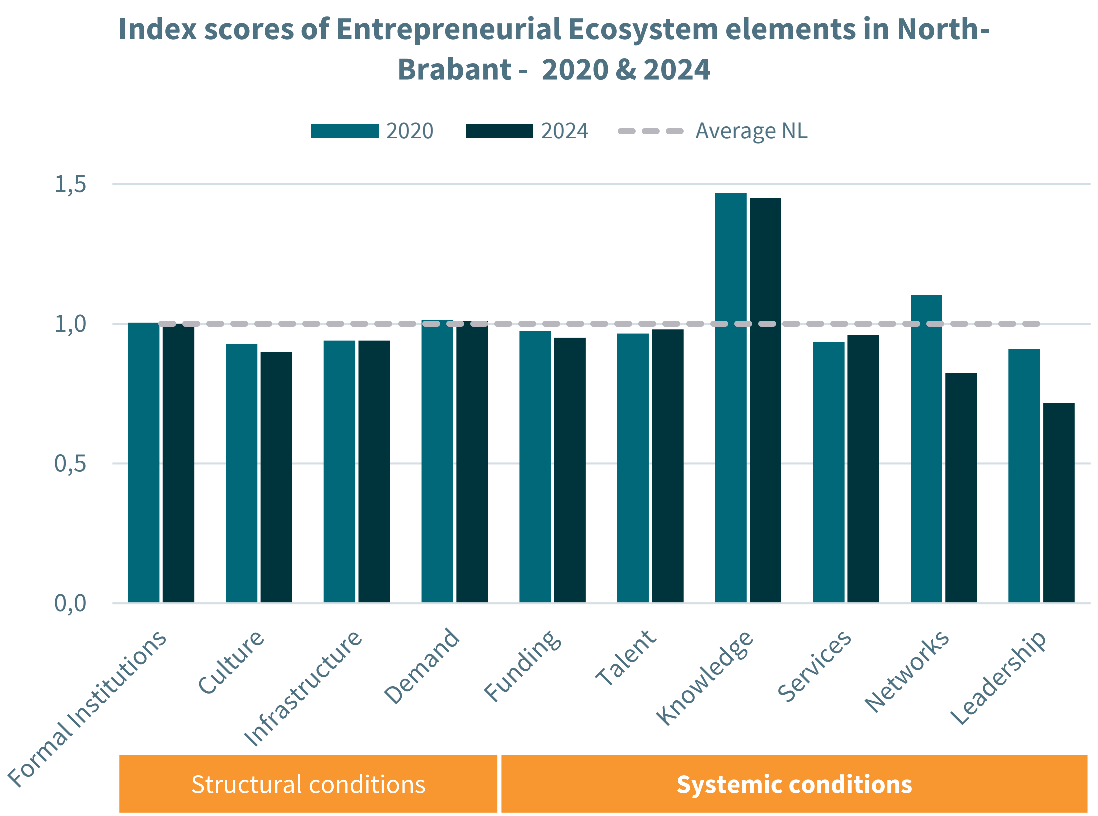
The Brabant ecosystem is stable compared to 2020

- A starting point for analysis is the *Entrepreneurial Ecosystem Index* (EE Index). This index quantitively measures the strength of each ecosystem element for each region in The Netherlands. **Scores are relative to the Dutch average** and normalised around 1. Higher scores indicate stronger ecosystem elements. A description of the used indicators can be found in the appendix.

- The province of Brabant in total scores **around the national average**: the total index score, constructed as the sum of the scores of the ten ecosystem elements, is just under 10. The element knowledge scores far above average, while the ecosystem elements leadership and networks have relatively weakened.

- This means that the strength of these ecosystem elements has diminished relative to the other Dutch regions. Due to a surge in growth in Randstad regions that influences the Dutch average, Brabant's score has decreased. **This does not mean that the absolute performance of the region has worsened**.





Birch (2024) Entrepreneurial Ecosystem Index 2024 – Stedelijke regio's versterken hun positie. Note: the methodology of the infrastructure element has changed between 2020 and 2024 and data sources fluctuate in quality between 2020 and 2024, especially on leadership and networks.

Brabant has a strong ecosystem, anchored to Southeast Brabant

- The *Entrepreneurial Ecosystem Index* can be constructed for all the Dutch so-called COROP-regions. North-Brabant consists of four of these COROP-regions. **Three of the regions in Brabant score below average on the index, while Southeast Brabant is considered one of the strongest ecosystems in The Netherlands**.

- The **presence of knowledge-intensive companies that invest heavily in R&D, such as ASML and NXP, and a university of technology are crucial** for the strong entrepreneurial ecosystem of Southeast Brabant. This is reflected in the strong elements of knowledge, leadership and networks as well as talent, where many companies in the region demand highly skilled talent and attract this talent from all over the world. Demand in the region is relatively strong, while the entrepreneurial culture and infrastructure perform only slightly below the Dutch average.

Scores and changes of ecosystem elements in Brabant (2024)*

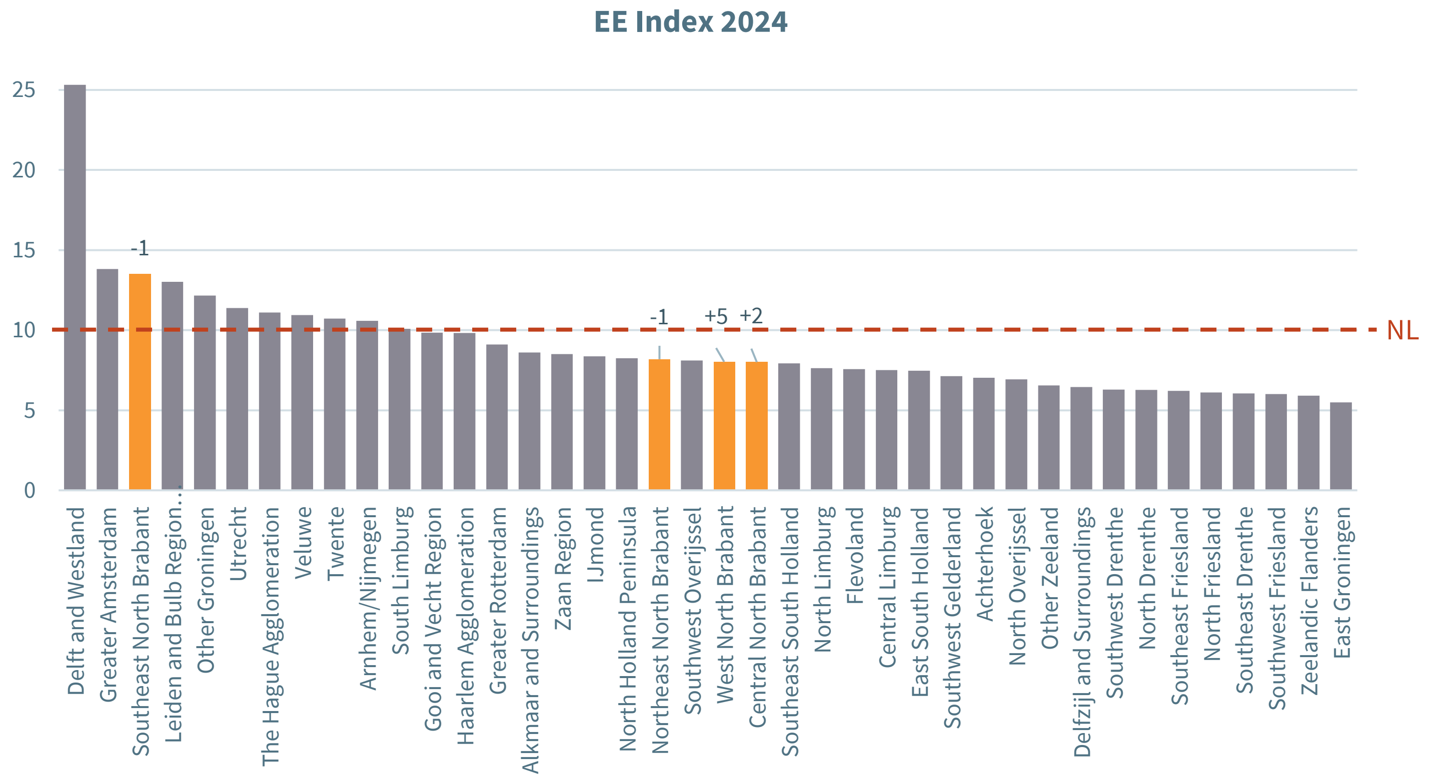
Element	W-Brabant	Δ	M-Brabant	Δ	NE-Brabant	Δ	SE-Brabant	Δ
Leadership	0,18	-0,16	0,45	-0,10	0,29	-0,17	1,85	-0,14
Networks	0,32	-0,24	0,40	-0,29	0,29	-0,36	1,98	-0,21
Funding	0,95	-0,02	0,95	-0,02	0,95	-0,02	0,95	-0,02
Knowledge	0,76	-0,04	0,69	-0,08	0,90	-0,04	2,73	-0,02
Talent	0,96	0,05	0,92	-0,01	0,96	-0,01	1,07	0,05
Services	0,97	0,02	0,95	-0,02	0,94	-0,03	0,96	0,01
Institutions	1,00	0,00	1,00	0,00	1,00	0,00	1,00	0,00
Infrastructure	1,00	0,01	0,90	0,00	0,97	0,00	0,91	-0,01
Demand	1,01	0,00	0,83	-0,03	0,97	-0,01	1,17	0,02
Culture	0,89	-0,02	0,90	-0,02	0,90	-0,02	0,89	-0,06
Total score	8,03	-0,43	8,00	-0,53	8,19	-0,58	13,52	-0,38

Strong	>1,05	Average	> 0,95 < 1,05	Weak	> 0,50 < 0,95	Poor	< 0,50

Birch (2024) Entrepreneurial Ecosystem Index 2024 – Stedelijke regio's versterken hun positie.
* Note: delta (Δ) is based on the change of element scores between 2020 and 2024

Brabant regions experience small changes in position in the ranking

- The Ecosystem of Brabant can be nationally ranked compared to other COROP regions. **Southeast-Brabant drops from second to third place** compared to the 2020 Index, but the difference with Greater Amsterdam is marginal.
- **West-Brabant climbs 5 places** compared to its position in the rankings in 2020, while Northeast-Brabant fell by one place and Central Brabant climbed by two.
- These changes in position are reflective of small changes in index scores and **do not seem to reflect a drastic change in quality** of the ecosystem.



Birch (2024) Entrepreneurial Ecosystem Index 2024 – Stedelijke regio's versterken hun positie.
Note: labels indicate the change in ranking of the COROP region compared to 2020

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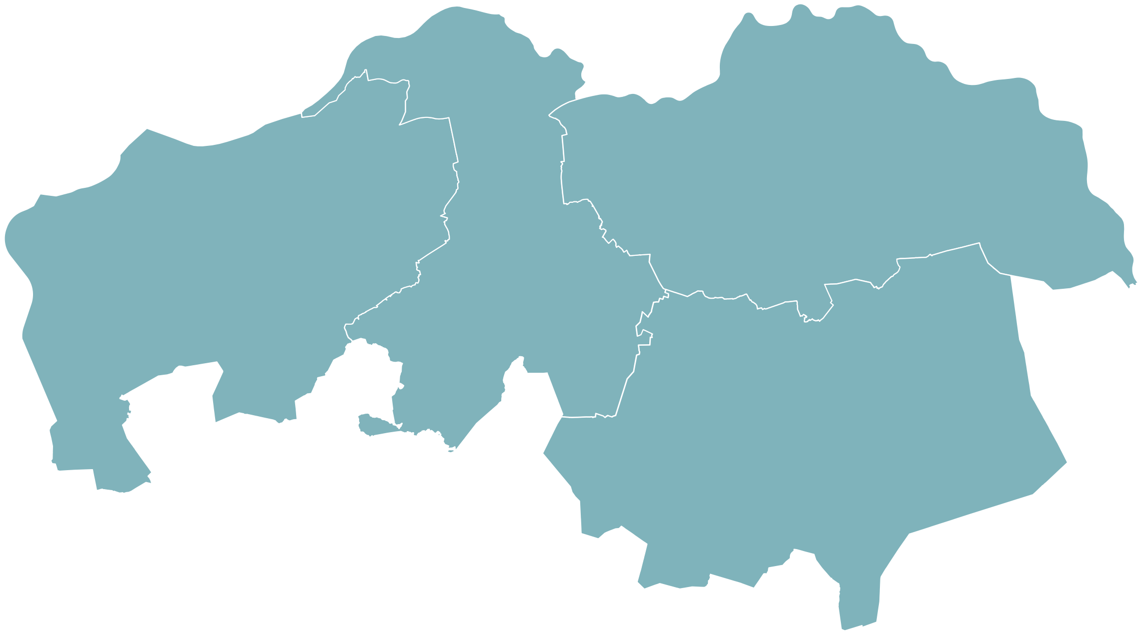
Deep dive into ecosystem elements

Perceived quality of leadership has improved through better coordination

- There is an increased recognition that the Brabant ecosystem is **heterogenous in its economic structure**, with little overlap between subregions or even within subregions. It reflects a tension between geographic regions and administrative boundaries, where some regions do not historically 'feel' they have common economic ground, respondents say.
- This recognition has led to **lessening the 'competitive attitude' between subregions**, which has made it possible to create a joint agenda for the future and better coordinate the support for entrepreneurs. Ecosystem leaders and feeders unanimously state that joint efforts have brought more clarity and better leadership to the region.
- However, **differences in maturity between subregions create challenges** for the whole region. The quality of leadership in subregions is correlated with the maturity of the startup ecosystem, especially where the historical focus is on new technologies. SE-Brabant (Brainport) has active and experienced leadership whereas the other regions are lagging, although W-Brabant and M-Brabant have markedly improved since 2020.
- A smaller population of startups in these regions **decreases the perceived necessity of local support for startups**. The existence of local support sometimes conflicts with Brabant-wide initiatives for startup support.
- The tension remains that not all subregions have the resources and know-how to sufficiently support entrepreneurs. At the same time, these subregions feel that **Brabant-wide support mechanisms can be biased** towards tech entrepreneurship in SE-Brabant and do not provide support for the whole ecosystem.

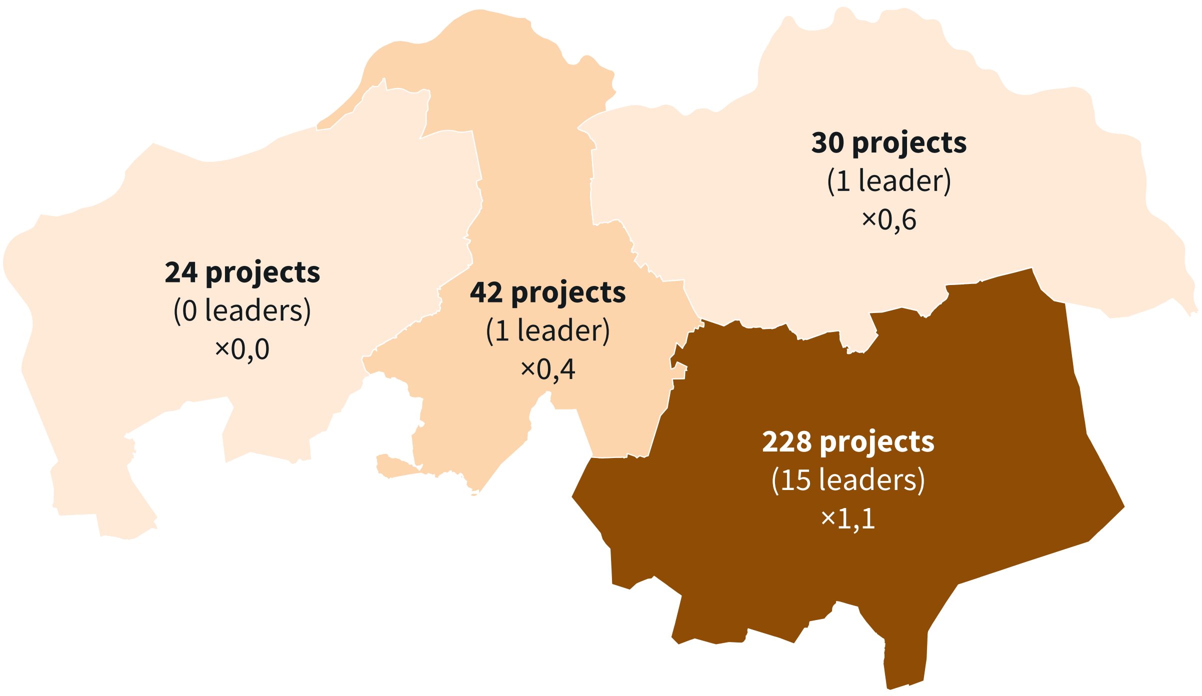


Research and innovation leaders are concentrated around Eindhoven

- Leadership in research and innovation measured through the coordination of projects under the European innovation programme Horizon Europe (2020-2024)* shows that organisations in **SE-Brabant are the main coordinator** of international innovation projects, due to the presence of the TU/e. This type of leadership concentrates in universities (of technology).
- Leaders of Horizon Europe projects are approximately **as prevalent as the national average** in Brabant.

Top leaders (≥2projects)	#Projects led (81% of total)
TU/e	33
Tilburg University	12
ASML	2
KIC InnoEnergy	2
Philips	2

Distribution and prevalence of innovation projects and leaders



* Source: CORDIS database on Horizon Europe projects, dating from 2020 - 2024. In total there are 127 unique project coordinators in The Netherlands. Of these, 17 are located in Brabant, where together they lead 63 projects. The national average is 127 leaders per 2.154 projects ~0,059. The Brabant average is 17 leaders per 315 projects ~0,054.

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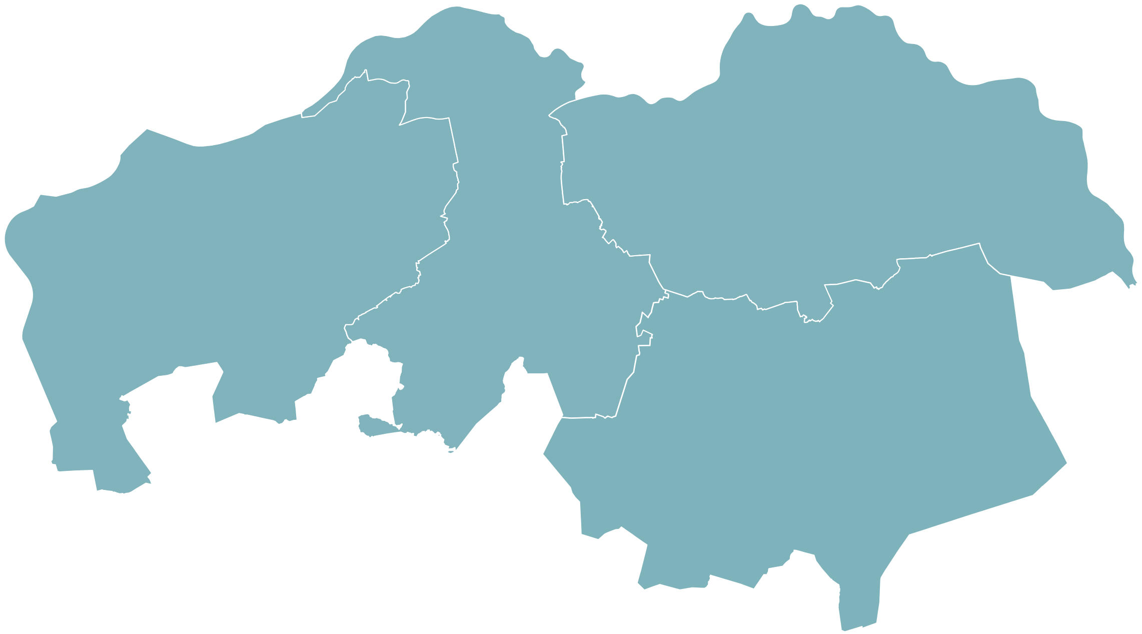
Formal and informal networks have strengthened in quantity and quality

- Ecosystem leaders and feeders have unanimously noticed that the perceived **quality of networks for entrepreneurial ecosystem support has markedly improved**. Regional and subregional organisations now regularly meet, organise events and collaborate. There is an increase in the number of startup support initiatives.
- This is partially attributed to an increasingly '**shared language**' between ecosystem leaders and feeders, improving communication, collaboration and sharing best practices. This language is now commonplace across startup support organisations but has not yet crossed over to other public organisations, such as municipal economics departments.
- The increase in quantity of startup support also creates a challenge. The numerous subregional development agencies, funds and incubators create an **increased need for coordination** between initiatives. This risks devolving into discussions on dividing responsibilities and alignment as there are no clear governance relationships between the support organisations. The success of some initiatives has even caused them to take on responsibility that exceeds the role they were originally assigned.
- The tension between geographic and administrative borders previously mentioned is also present here, with SE-Brabant looking more at **national and international** networks as relevant, whereas other subregions are still figuring out effective local configurations.



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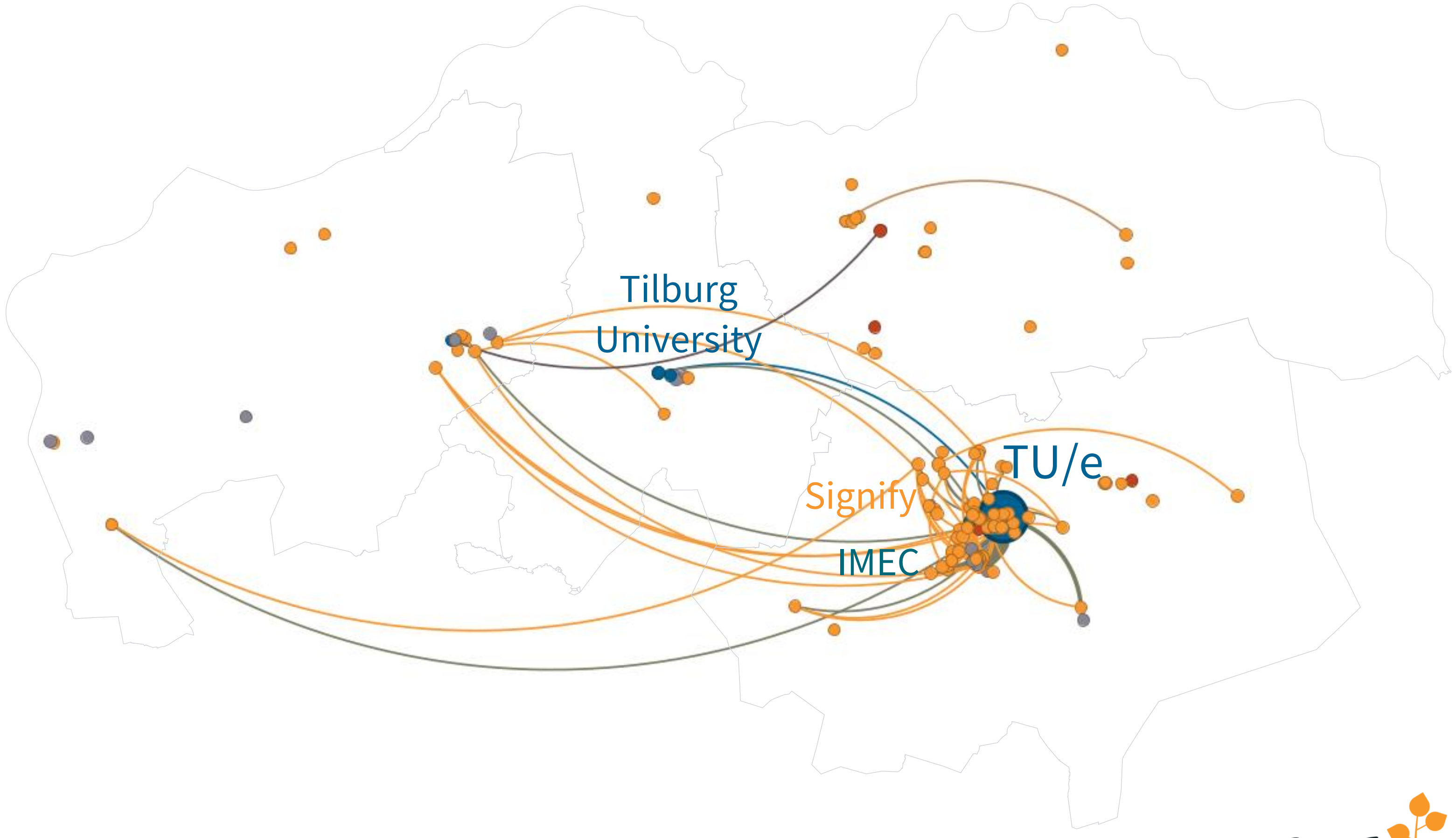
Innovation networks cluster in Eindhoven, with central position for TU/e

- Most of the activities and collaborations in Horizon Europe **research and innovation projects concentrate around the Brainport Region**.

- Within these innovation networks, education institutes account for only 3% of the organisations in these networks but engage in 35% of the collaborations. The **TU/e takes the central position** and has the highest number of collaborations with partners in the region. IMEC is the most centrally positioned research organisation in the province, while Signify takes the most central position of the private organisations.

Type	% Organisations	% Collaborations
Private	**79%**	**50%**
Education	3%	35%
Research	2%	4%
Public	3%	1%
Other	13%	9%



Source: CORDIS database on Horizon Europe projects 2020-2024.

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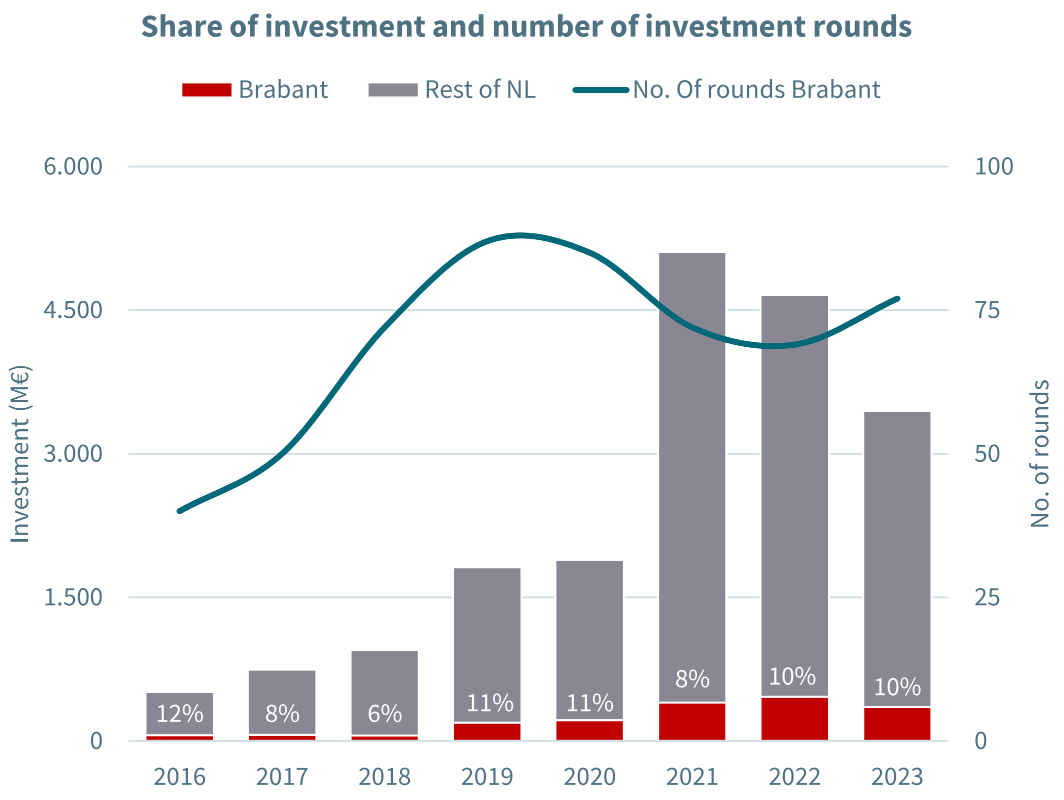
Brabant startup funding increases absolutely and is relatively stable

- This analysis is based on ~5.000 funding rounds since 2016, of which ~3.400 have disclosed investments, totalling 19,1 B€. Of this, 552 investment rounds take place in Brabant, for 368 (67%) of these rounds the amount of investment is known. These **368 rounds are invested in 205 unique start-ups**. Average round size in 2023 is 4,6 M€ in Brabant, against 5,3 M€ nationally.
- Funding of new start-ups saw a massive increase in 2021 but has declined in 2023, whilst remaining above 2020 levels. **Brabant's share of investment has remained around 10% of total investments in the Netherlands**.
- Considering that 16% of Dutch start-ups is in Brabant, the ecosystem has been **underperforming in the amount of funding raised**. This could be due to the type and growth stage of startups that are in Brabant, or due to scale-ups moving out of Brabant when searching for larger tickets.
- **The total number of rounds per year has increased** since 2016; since 2019 it has fluctuated around 75.
- Note that although raising capital is important for high-growth scale-ups, most start-ups operate without raising external funding. In Brabant, **85% of start-ups is bootstrapped or has not published funding information**, compared to 79% nationally.



Dealroom data (2024). Filters: startups launched in or later than 2010. Acquisition, IPO, ICO and Buyout rounds are excluded. *Note that the number of rounds and investment size are an indication but do not reflect the total portfolio of investments. *Note that there might be delay up to three years in uploading investment round data in Dealroom.

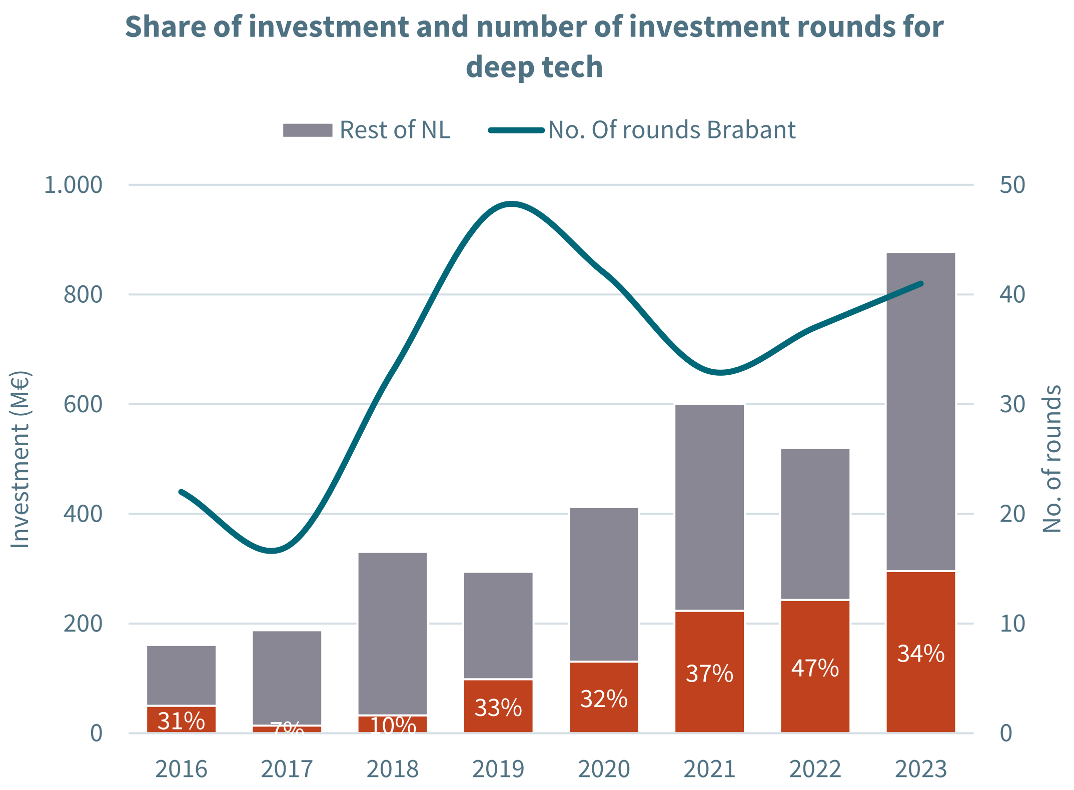
Brabant ecosystem excels in raising funding for deep tech startups

- This analysis is based on ~1.300 deep tech funding rounds since 2016, of which ~900 have disclosed investment amounts, totalling 3,4 B€ of investments. Of this, 273 investment rounds took place in Brabant, for 189 (69%) of these rounds the amount of investment is known. These 189 rounds are invested in 82 unique start-ups. **Average round size in 2023 is 7,2 M€ in Brabant, against 5,6 M€ nationally**.

- **2022 was a peak year for funding of deep tech startups in Brabant**, as almost half of total deep tech funding landed in the region.

- Considering that 18% of Dutch deep tech start-ups is in Brabant, the ecosystem has been **overperforming in the amount of funding raised by deep tech startups** in Brabant. The total number of rounds in Brabant is fluctuating around 40 since 2019. Deep tech rounds account for half or more of total investment rounds in Brabant.

- The majority (71%) of the deep tech startups in Brabant has reported being funded, compared to 17% for the average startup in Brabant. This is higher than the Dutch average, where 59% of deep tech startups report being funded. It indicates that **deep tech startups need relatively more external funding** to survive and scale than the average startup.



Dealroom data (2024). Filters: startups launched in or later than 2010. Acquisition, IPO, ICO and Buyout rounds removed from dataset. *Note that the number of rounds and investment size are an indication but do not reflect the total portfolio of investments. *Note that there might be delay up to three years in uploading startup data in Dealroom.

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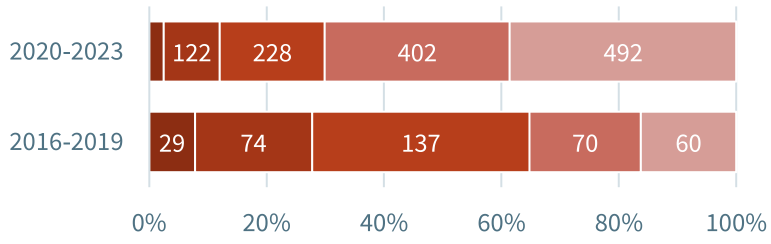
Ticket sizes are growing, while number of pre-seed rounds is decreasing

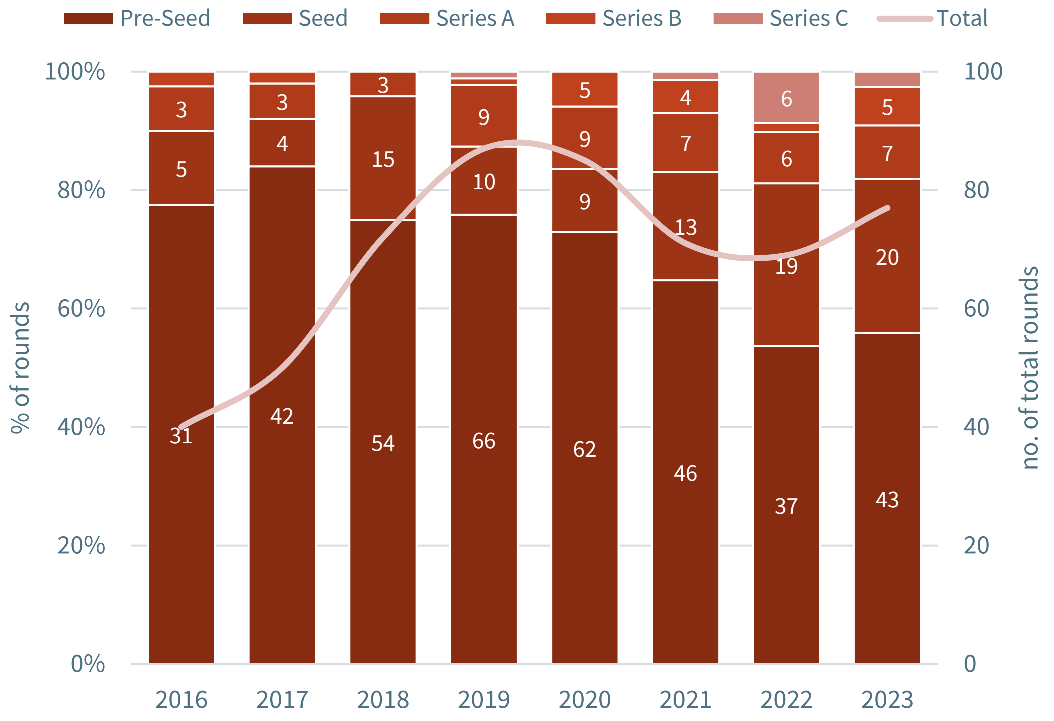
- This analysis is based on 552 funding rounds from 2016-2023 in Brabant, worth ~1,6 B€ in total. We see a shift in proportion by investment type. The **share of pre-Seed investment rounds is decreasing**, while higher ticket size rounds are increasing. Series B and C rounds were barely present from 2016-2019 but have become more prevalent between 2020 and 2023.
- The total investment amount in Brabant startups was 369 M€ for the period 2016-2019 and increased to 1,3 B€ for the period 2020-2023. While pre-seed investments saw a proportional decline in number of rounds, **the absolute amount of pre-seed investments remained stable**.

Total amount of investment (in M€) by type in Brabant



Round type	Round size (€)
Pre-Seed	≥ 1 M
Seed	≥ 1 M & <4 M
Series A	≥ 4 M & < 15 M
Series B	≥ 15 M & < 40 M
Series C	≥ 40 M & < 100 M

Proportion of rounds by type in Brabant



Data: Dealroom. 2024. Filters: startups launched in or later than 2010. Acquisition, IPO, ICO and Buyout rounds removed from dataset. *Note that the number of rounds and investment size are an indication but do not reflect the total portfolio of investments. *Note that there might be delay up to three years in uploading startup data in Dealroom.

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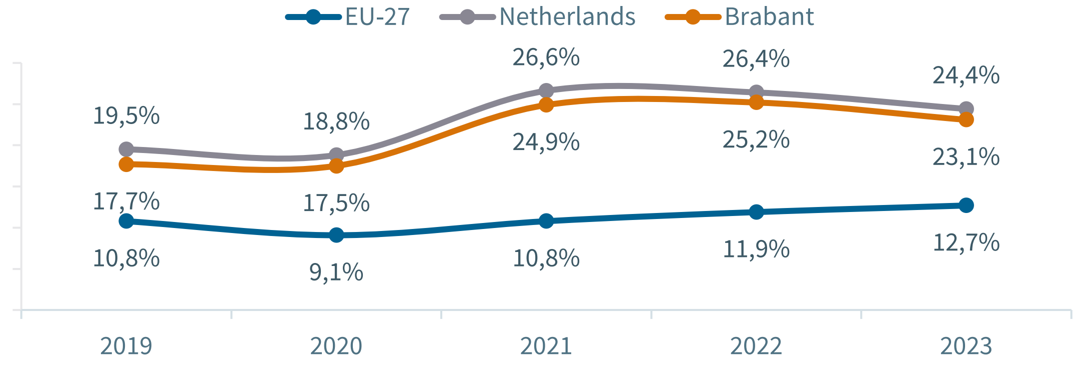
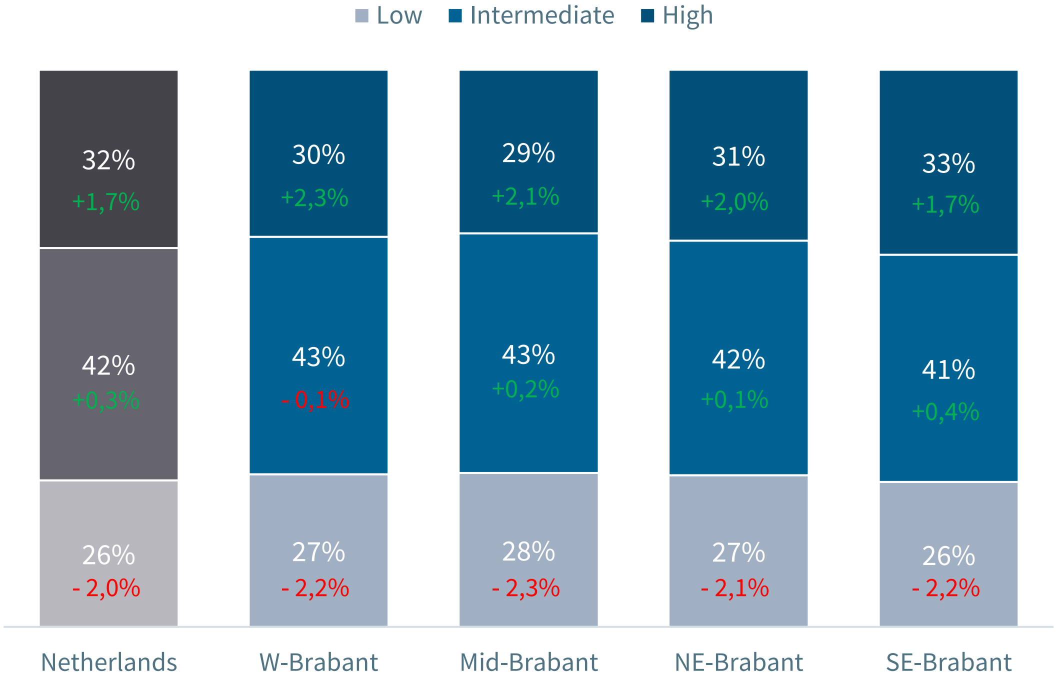
Brabant has a talent distribution that is comparable to the rest of NL

- Compared to the Netherlands, Brabant sees similar education trends, with a stable population of people with intermediate education, surrounded by a **growing population of people with higher education** and a shrinking population with lower education.
- The **share of lifelong learners is relatively high** in the Netherlands and Brabant remains on par with this share.

Share of adults participating in lifelong learning



Educational level of the population in 2022 and development since 2020



Source: CBS (2022) & Eurostat (2023). Highly educated is hbo bachelor or higher. Adults are aged 15-75.

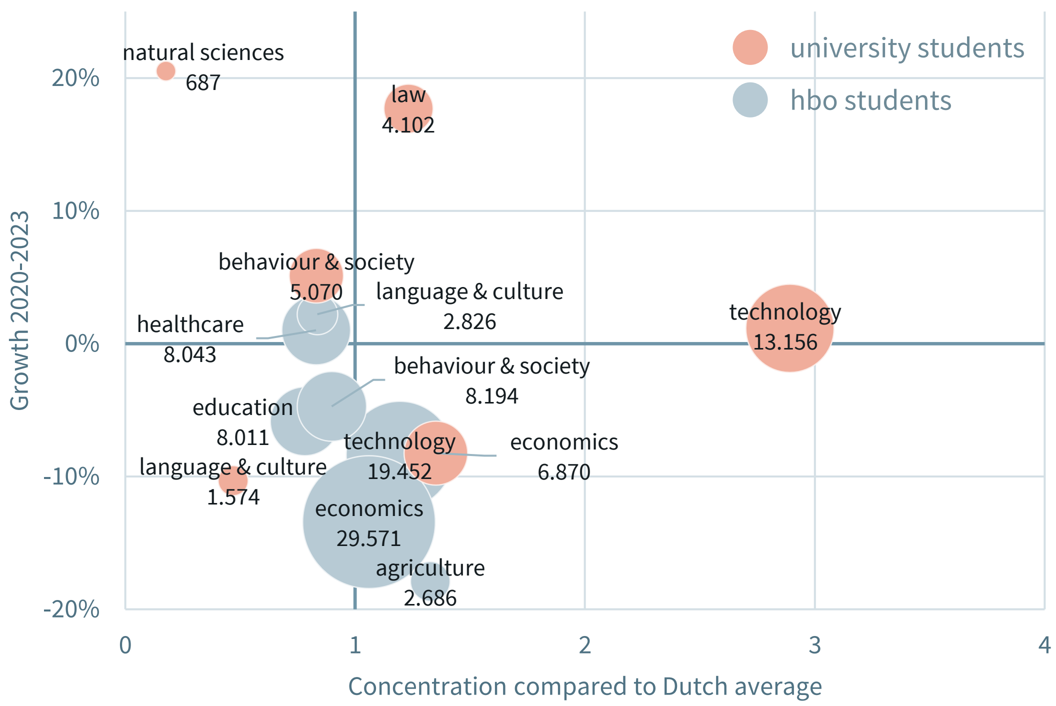
Technological talent growth is slowing at universities, declining in hbo

- Brabant has a wealth of high performing educational institutes: four universities of applied sciences (hbo: Fontys, Avans, Breda, HAS) and two top universities (wo: Tilburg University and the Eindhoven University of Technology (TU/e)). Together they educate **111.000+ students, ~79.000 hbo and ~33.000 university**. This is 17% and 10% of the national student population, respectively.

- There has been a decrease of hbo students in the region. The population has shrunk 9% with ~7.700 students between 2020 and 2023. The number of university students is more stable with an increase of 1% (~300 students).

- While Brabant experienced an increase of technology students at hbo (23%) and university (23%) between 2015 and 2019, the **number of technology students has stopped growing**. The technology student population at hbo has decreased with 8%, while the growth of this student population at university level slowed down to 1%. As this is a national trend, the concentration of technology students in Brabant remains stable.

Trend in talent – higher education



Data: DUO (2023). Includes bachelor and master students. Note that student populations in categories <500 are not considered. For hbo, this includes multidisciplinary students. For university, these are: healthcare, education, agriculture and multidisciplinary students.

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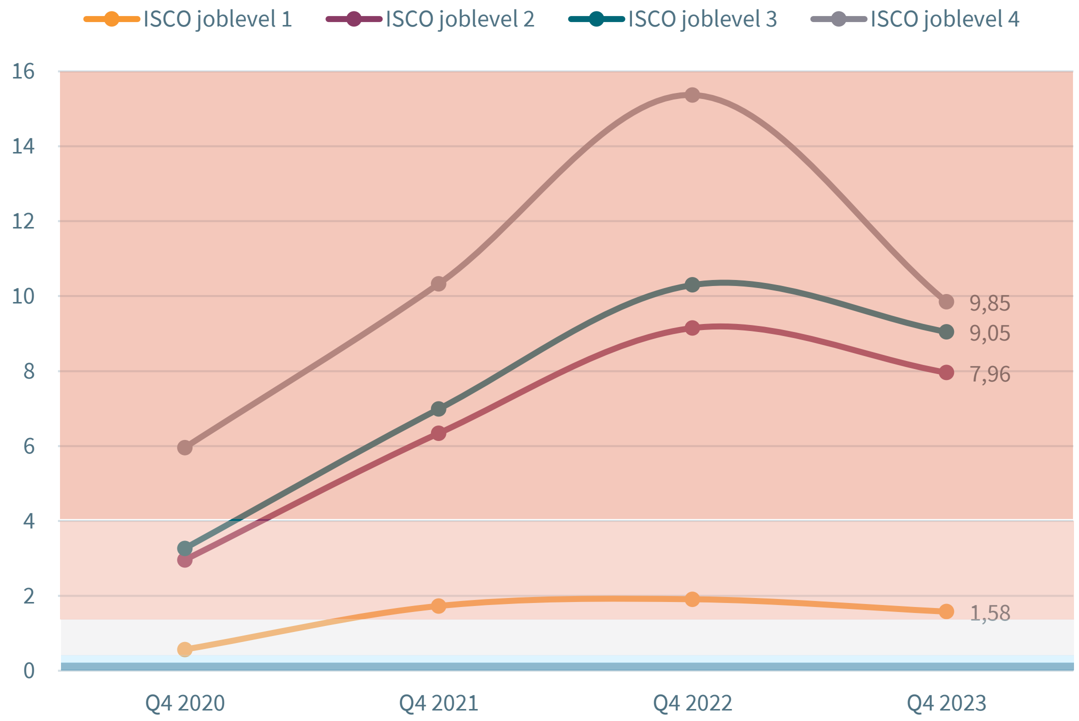
Greater shortage in IT and Technological talent for higher job levels

- Since 2020 the labour market has tightened considerably, making it **harder to find talented people**, especially for higher level IT and technological jobs.
- This labour market shortage is a **national problem**. Overall, tension in Brabant (4,34) is higher than the Dutch average (3,89). For IT and technological jobs, the tension is 6,77 (Brabant) and 5,83 (Netherlands).
- Most recently the slack has returned slightly for IT and technological jobs in general, but this obscures the difficulty firms have in **acquiring highly specialised talent in high tech**.

ISCO joblevel 1	elementary or lower level of education required
ISCO joblevel 2	primary or secondary education level required
ISCO joblevel 3	secondary or higher education level required
ISCO joblevel 4	higher or scientific level of education required

4,00 - 16,00	very tight
1,50 - 4,00	tight
0,67 - 1,50	average
0,25 - 0,67	slack
0,06 - 0,25	very slack

Labour market tightness for IT and Technological jobs in Brabant



Source: UWV (2023)

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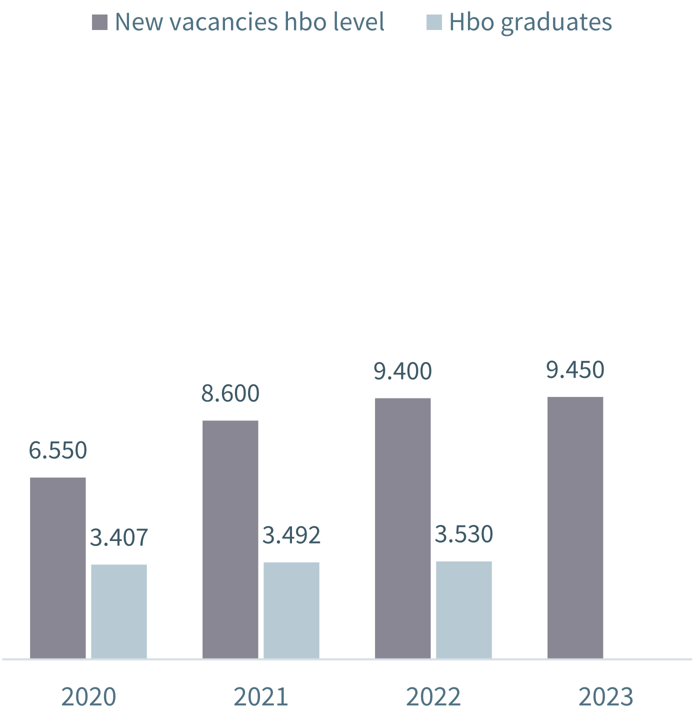
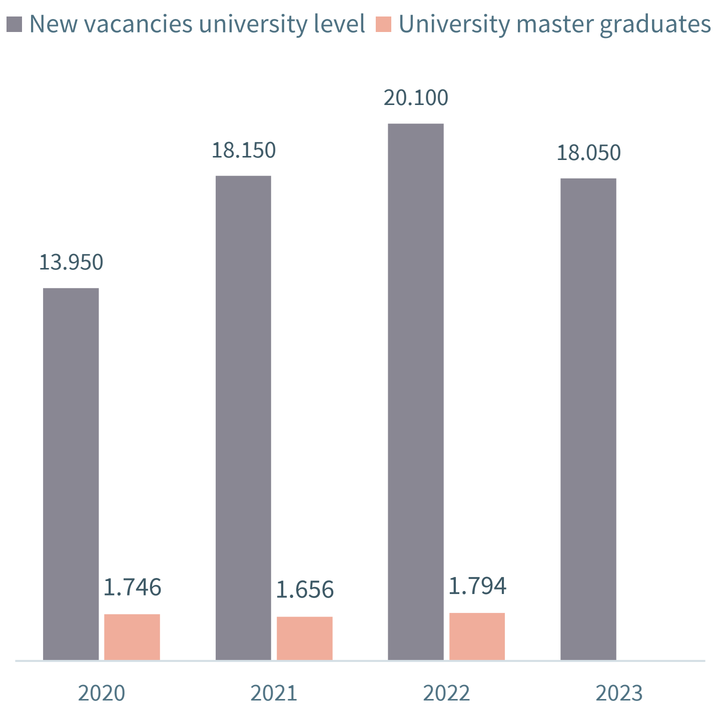
Technological talent pool in Brabant is too small to meet labour demand

- One fundamental difficulty is that **the talent pipeline is too small** to fulfil yearly demand.
- Estimates on the number of vacancies and the number of relevant graduates show **a disconnect** of up to 62% at the hbo level and up to 91% at the university level.
- This is partially solved by attracting Dutch talent from other regions and international talent from other countries. This still means **Brabant will be competing** with these regions and countries over limited human capital.

New IT and Technology vacancies* vs. technology graduates**





Sources: UWV (2023), DUO (2023). Data for number of graduates in 2023 is not yet available.
* IT and Technology vacancies include vacancies in IT-jobs and technical jobs, as classified by UWV.
** At hbo level, technology graduates include graduates in the sector technology (Dutch: techniek). At university level, technology graduates include master's graduates in the sectors natural sciences (Dutch: natuur) and technology (Dutch: techniek).

Private R&D expenditure has increased in Brabant since 2020

- A total of 69 organisations in the Netherlands made it to the EU Industrial R&D top 1.000 Investment Scoreboard 2023, of which **8 are (partially) based in Brabant**.
- These organisations are ranked according to their yearly R&D expenditure. Brabant has **multiple private organisations with large R&D budgets**. More specifically ASML, NXP Semiconductors and Philips are in the top 5 leaders in the Netherlands in research and development expenditure. Combined these firms spend more than **6,9B€ a year on R&D**.
- Compared to 2019, most R&D budgets have increased. Of the Brabant companies that are listed, the **total R&D budget increased with 37%** between 2019 and 2022 (compared to a 34% increase on average in the Netherlands).
- **Most firms with large R&D budgets are in Southeast Brabant**. West-, Northeast- and Mid Brabant have significantly less prevalence in private R&D.

Ranking of companies located in Brabant by yearly R&D budgets; 2022*

Organisation	Ecosystem	2019 R&D budget (€M)	2022 R&D budget (€M)	Growth
ASML Holding	SE-Brabant	1.844	**3.072**	+67%
NXP Semiconductors	SE-Brabant	1.448	**2.016**	+39%
Philips	SE-Brabant	1.645	**1.825**	+11%
TomTom	SE-Brabant	318	**344**	+8%
VDL Groep	SE-Brabant	157	**170**	+8%
Cosun	W-Brabant	21	**19**	-10%
ONWARD Medical	SE-Brabant	-	**11**	-
Heijmans	NE-Brabant	-	**10**	-

*Ranking of R&D-budgets based on EU Industrial R&D top 1.000 Investment Scoreboard of the European Commission (2023). Data for the 2023 Scoreboard was collected in the year 2022, and data for the 2020 Scoreboard was collected in the year 2019. Data for ONWARD Medical and Heijmans for the year 2019 was not available, as they were not in the top 1.000 then.

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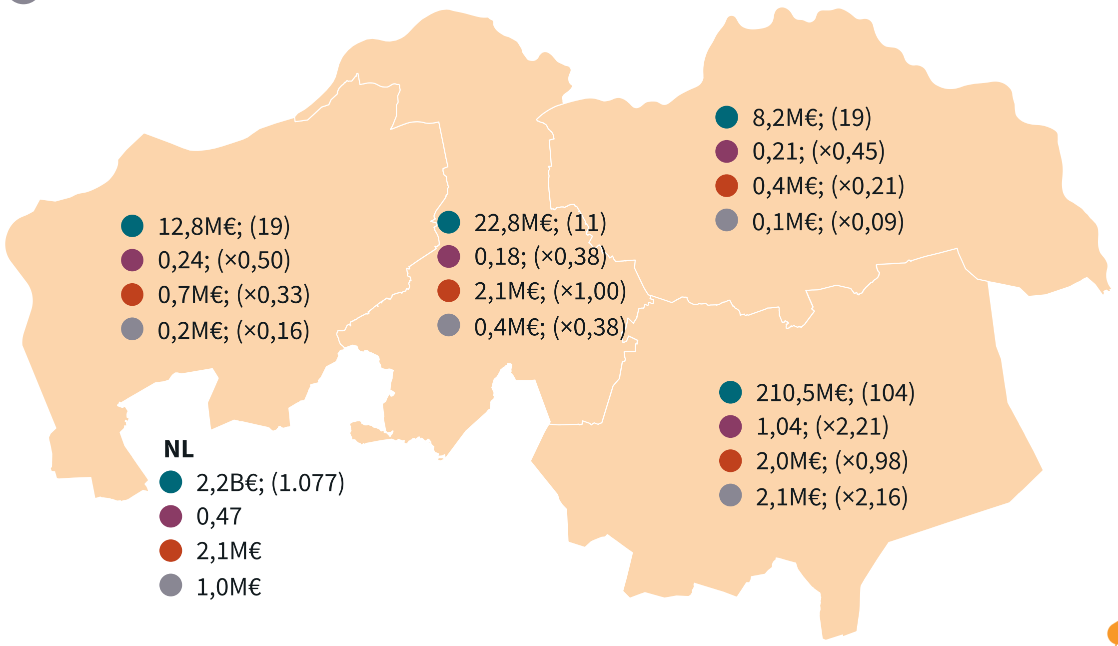
Public knowledge development is centered around (technical) universities

- Further insight in knowledge development is provided by analysing activity of organisations (both public and private) in Horizon Europe projects. **SE-Brabant is one of the leading regions in The Netherlands when considering total Horizon Europe contribution prevalence.** It has more active R&D organisations that on average claim more R&D funding in the programme.
- M-Brabant has an around average contribution prevalence. Other regions in Brabant have below average activity in Horizon Europe projects and funding.

Knowledge development in Horizon Europe projects

- Total Horizon Europe contributions[1]; (# of unique actors)
- Horizon Europe actor prevelance; (compared to national average)
- Average Horizon Europe contribution per unique actor; (compared to national average)
- Horizon Europe contribution prevelance; (compared to national average)

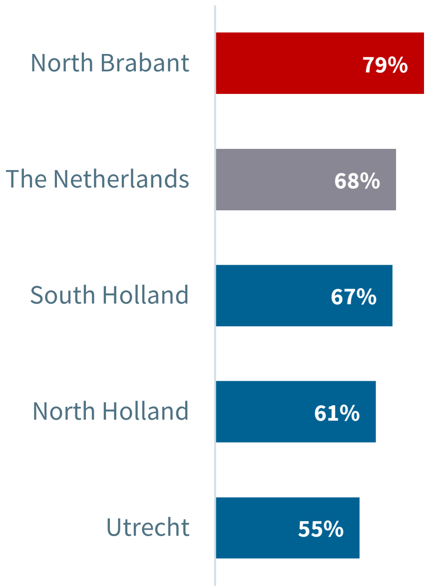


Data used is from Horizon Europe projects started 2020-2023

Southeast Brabant leader in public-private knowledge development

- Public-private collaboration in knowledge development is considered a main driver of innovation. Of all the received Horizon Europe contributions **79% are allocated to private research companies in Brabant**. With the national average being 68%, this makes Brabant a leader in public-private knowledge development.
- **On individual firm level, received contributions vastly differ**. Again, ASML, Philips and NXP Semiconductors are at the centre of private R&D and knowledge development.
- Especially **M-Brabant has a small number of private research companies** (<10) that participated in projects and received Horizon Europe contributions, and no firms with relatively large (>1,5€M) Horizon Europe contributions.

Percentage of Horizon Europe funds allocated to private actors in Dutch university regions



Rank of private organisations with largest received Horizon Europe funds (in €) per subregion

W-Brabant

Power Research Electronics	1,8M€
Process Design Center	1,7M€
Fokker Elmo	1,5M€
Sabic Global Technologies	1,5M€
Alfred H. Knight Holland	0,6M€
Coval Energy	0,5M€
Arega Medical Nederland	0,3M€
Aerospace Propulsion Products (A. P.P.)	0,1M€

NE-Brabant

Angiogenesis Analytics	2,0M€
Corvers Procurement Services	1,0M€
Euro Support Advanced Materials	0,4M€
Inprocess-LSP	0,3M€
Vion Food Nederland	0,2M€
Agrifood Capital	0,2M€
Argaleo	0,1M€
Landlng Aquaculture	0,1M€
Kelvin	0,1M€
Udea	0,1M€

M-Brabant

3D-Pharmxchange	1,5M€
Susmetro EU	0,6M€
Coolrec	0,6M€
Mineralz	0,1M€
Aratos Systems	0,1M€

SE-Brabant

ASML Netherlands	6,5M€
Philips Medical Systems Nederland	6,3M€
NXP Semiconductors Netherlands	5,4M€
Signify Netherlands	4,5M€
Smart Photonics	3,5M€
FEI Electron Optics	3,5M€
Heliox	3,1M€
Philips Electronics Nederland	3,1M€
Onward Medical	2,5M€
Inphocal	2,5M€

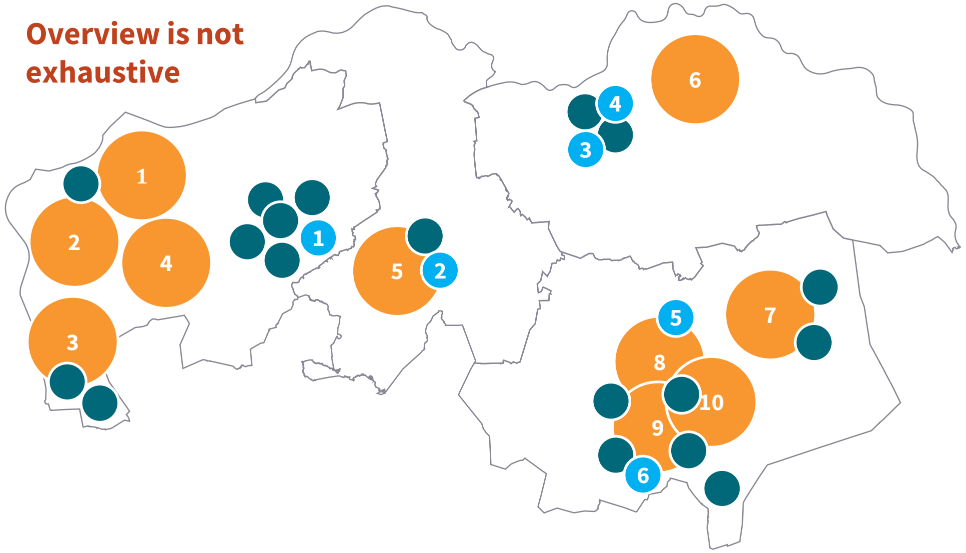
Data used is from Horizon Europe projects started 2020-2023

Services available to promote cooperation and knowledge exchange

- Services comprise **all activities that smoothen entrepreneurial activity and start-up growth**. This requires service providers such as intellectual property lawyers, software suppliers, incubator programmes and other training facilities.

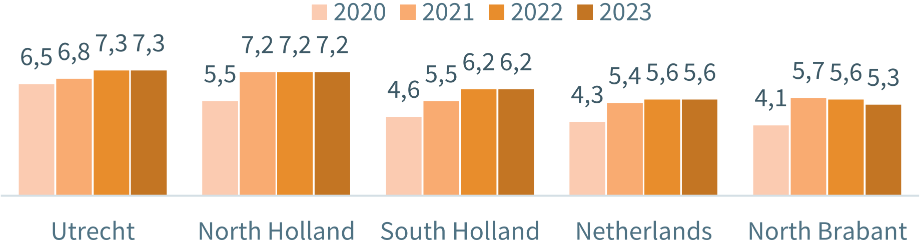
- Services for knowledge driven start-ups often **concentrate on campuses**, providing scientific knowledge, innovation support and facilities. Brabant has several campuses, business parks, workspaces and field labs in the region, concentrated in Brainport. These services and facilities focus on promoting coworking and cooperation, for example through specialized and thematic hubs.

- Another measure for services is the share of employees in in high-technology manufacturing and knowledge-intensive high-technology services, for which Brabant dropped a little below national average since 2023.



Campuses	1 Port of Moerdijk
	2 Green Chemistry Campus
	3 Aviolanda Woensdrecht
	4 Side Stream Innovation Valley
	5 Gate2 Gilze-Rijen
	6 Pivot Park Oss
	7 Automotive Campus Helmond
	8 High Tech Campus Eindhoven
	9 Brainport Industries Campus
	10 Tu/e Campus
Workspaces	1 B'WISE
	2 Gebouw 90
	3 Grasso & Jamfabriek
	4 Gruyter Fabriek
	5 Microlab
	6 Twice
Fieldlabs	

% of employees in high-technology manufacturing and knowledge-intensive high-technology services*



Source: Team analysis, based in part on input by Braventure and Provincie Noord-Brabant (2024). Toekomstbestendig Brabant.
*Eurostat (2024). Employment in technology and knowledge-intensive sectors by NUTS 2 regions.

Services aimed at supporting startups are prevalent throughout Brabant

- In Brabant, **numerous organizations are actively providing services to startups**. These include business development support, funding, venture building and incubator/accelerator services.
- There are **at least 13 organisations for start-up support**, providing programs, incubators and accelerators in Brabant, mainly focused on raising (venture) capital and startup growth.
- **Every region houses a regional development company and least one incubator/accelerator**. Most venture builders concentrate around Eindhoven and the campuses located there.
- **Most of these organizations collaborate** to provide a joint approach in guiding early-stage startups, aiming to prevent fragmentation and inefficiencies in the supply of startup support services.

Overview is not exhaustive

Source: Team analysis, based in part on input by Braventure and Provincie Noord-Brabant (2024). Toekomstbestendig Brabant.

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Conclusion

Brabant ecosystem has improved in quality and performance

- Brabant has the **third largest population of startups** of Dutch provinces. Brabant startup and scale-up population increased by 22% since 2020. Brainport remains the Brabant startup hub, but the other subregions are catching up and growing steadily.
- The proportion of scale-ups is growing, but still below national average. **Brabant has a relatively large share of well-funded scale-ups**.
- We see that **the Brabant ecosystem is stable** in *relative* strength since 2020 compared to the Dutch average. A deep dive into each of these elements shows a more nuanced picture, see the overview on the right.
- Brabant has exceptional entrepreneurial outputs. **Securing the future for Brabant requires continued investment in an exceptional ecosystem to support these outputs.**

	Condition	Situation, change since 2020 and challenge moving forward
	Leadership	Perceived quality of leadership has improved through better coordination. Deep tech leaders are concentrated in Brainport. The challenge is to reach all Brabant subregions with (existing) interventions.
	Networks	Formal and informal networks have strengthened in quantity and perceived quality. Innovation networks cluster in Eindhoven, with central position for TU/e. The challenge is to stay coordinated without losing effectiveness.
	Finance	Brabant startup ecosystem is underfunded in general but excels in raising funding for deep tech startups. The number of pre-seed rounds is decreasing, endangering the future pipeline.
	Talent	Technological talent growth is slowing at universities and declining in hbo. The current talent pool is too small to meet current labour demand. This talent pool is also essential for the foundation of new firms.
	Knowledge	Brabant is a leader in both public and private knowledge development, mainly due to activities in Brainport. The dependency on a small number of R&D leaders can be a risk moving forward.
	Services	Every subregion in Brabant now has services available aimed at supporting startups.

Appendix

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Method: Entrepreneurial Ecosystem Index

Description of elements and empirical indicators for COROP-level analysis

Elements	Description	Empirical indicators	Source(s)
Formal institutions	Quality and effiency of governance	Four components: corruption, law, effectiveness and accountability, in normalised scores on province level.	Quality of Government Survey 2022
Culture	The degree to which entrepreneurship is valued in a region	Number of new firms per 1.000 inhabitants.	Centraal Bureau voor de Statistiek (CBS) 2023
Infrastructure	Physical infrastructure	Three components: distance to main road, distance to train station and accessibility to passenger flights (within a 90-minute drive).	Regional Competitiveness Index (RCI) 2022 + CBS 2023
Demand	Potential market demand	GRP per capita.	CBS 2023
Networks	The connectedness of businesses for new value creation	Number of connected Dutch firms per 1.000 firms in innovative projects (Horizon Europe), average over 3 years.	CORDIS 2023
Leadership	The presence of actors taking a leadership role in the ecosystem	The number of coordinators on innovation projects per 1000 firms, average over 3 years.	CORDIS 2023
Talent	The prevalence of individuals with high levels of human capital	Percentage of population that has finished higher tertiary education	CBS 2023
Finance	The availability of capital for new firms	Intensity (average investment per firm) and prevalence (number of firms that receive investments per 1.000 firms) of investments on province level, average over 3 years.	Nederlandse Vereniging van Participatie-maatschappijen 2021 – 2023
Knowledge	Investments in new knowledge	Intensity (average investment per firm) and prevalence (number of firms that invest per 1.000 firms) of wage and capital investments for R&D.	RVO 2023
Intermediaries	The presence of intermediary services	Percentage of firms in intermediary services	CBS 2023

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