How do regional entrepreneurial ecosystems support adaptivity to the Covid crisis?
Measuring regional resilience by churn in firm and vacancy data

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Jan Peter van den Toren | Birch | Tilburg University
Erdem Bagir | Birch

With support of:
Bas van der Starre (Birch)
Abdulkader Abdullah, Dennis Raats, Anja Fehres (Tilburg University)

Motivation

Guided by issues of national and regional policy makers

1. How can we optimally use and intervene our regional entrepreneurial ecosystem to enhance **adaptivity**?

2. How can we measure the effect of this crisis most actually? What are **real-time** indicators of what's going on in our region/municipality/sector?

3. **Who are the firms** in our region that also in times of crisis are open for innovation, sustainability and digitalisation – to know, network and – if necessary - support them?
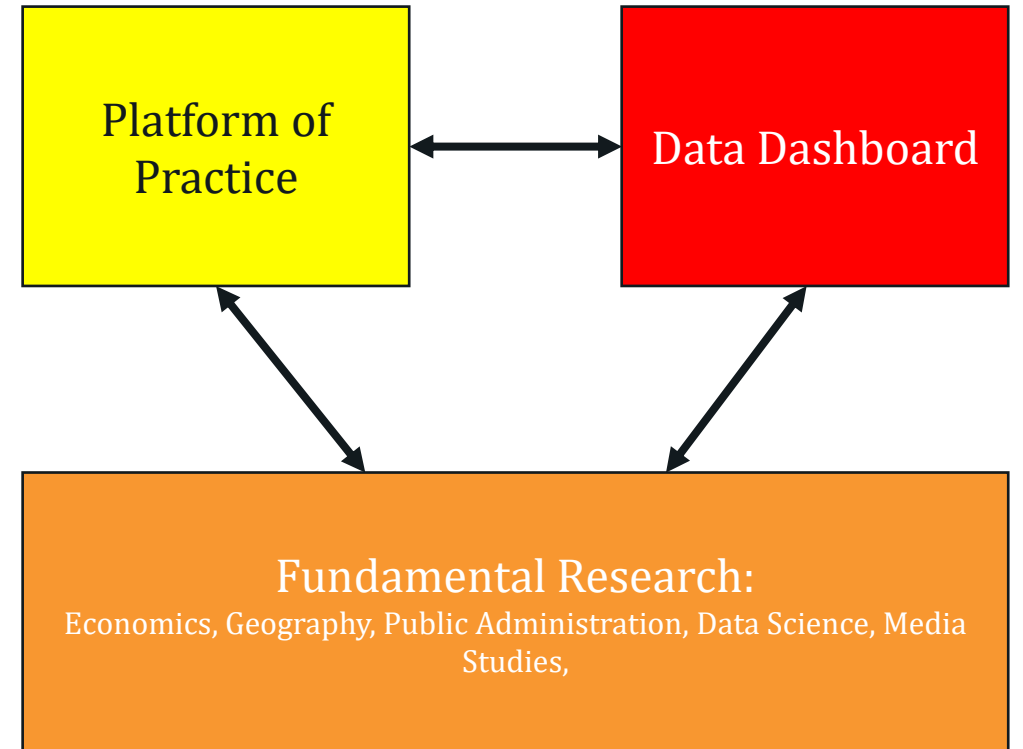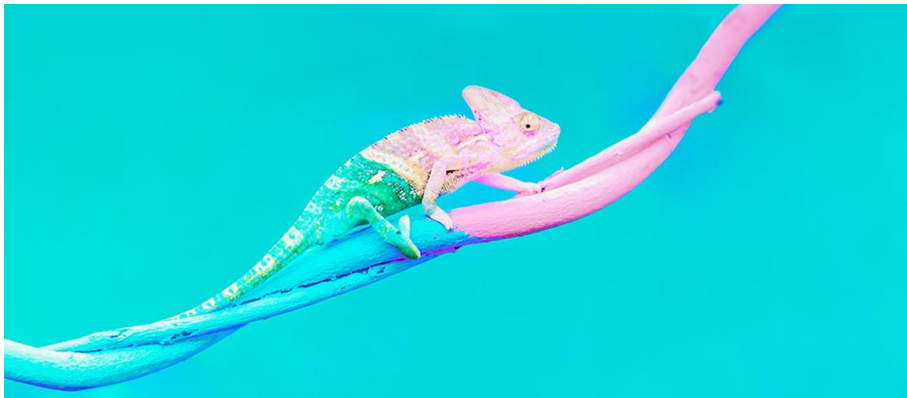
As scientists:

1. How can we **measure** adaption on a real-time basis?

2. What is the effect of **entrepreneurial ecosystems** on recovery versus adaptation?

Resistance and adaptiveness

Back to before or transforming to a new economy?

Platform of Practice ↔ Data Dashboard

Fundamental Research:
Economics, Geography, Public Administration, Data Science, Media Studies,

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Methodology: transdicsiplinary research

## Bridging between scientists and policymakers

1. Defining research questions in **dialogue** with practitioners and researchers

2. Building **dashboards** to give them the opportunity to have real-time insight on what's going on, without the need to wait for scientists.

3. **Analysing semi-open vacancy data and data on business dynamics**
Vacancy data: N= >1 million/year
Firm data: N=0,8 million

4. **Qualitive research at firms** how they experience the COVID crisis and what they do to cope this crisis.

5. On a regular basis (at least monthly) interviews with **policy makers** of (regional) government and (regional) triple helix organisations.

6. **Monthly transdisciplinary meetings** with scientists and policymakers to analyse what's going on, (possible) interventions and what they both see as effects in practice.

Rapid Respons Research: in interaction with policy makers

- *15 March 2020*: lockdown in the Netherlands: dramatic expectations regarding economy and society

- *April 2020*: formation of a consortium, working with and for *40 regions and sectors*.

- *May 2020*: formal start

- From *June 3, 2020* onwards: Monthly interactive webinars with regions and sectors

- *July 1, 2020*: First dashboard, focus on unemployment and vacancies https://bit.ly/UWV-EVER

- From *July 2020*: research on entrepreneurship as source of adaptiveness

- From *July 2020*: Platform of Practice: sharing and investigating policy interventions

- At the *same time*: government policy focusses (successfully) on backing existing firms to prevent them of losing job. The number of bankruptcies is historically low.

- *March 2021*: Third wave in the Netherlands, but also unexpected economic recovery

- *June 15, 2021*: Second dashboard, focus on Churn: https://birch-ever.shinyapps.io/EVERdashboard/

- *January 4, 2022* Third dashboard on churn in firms

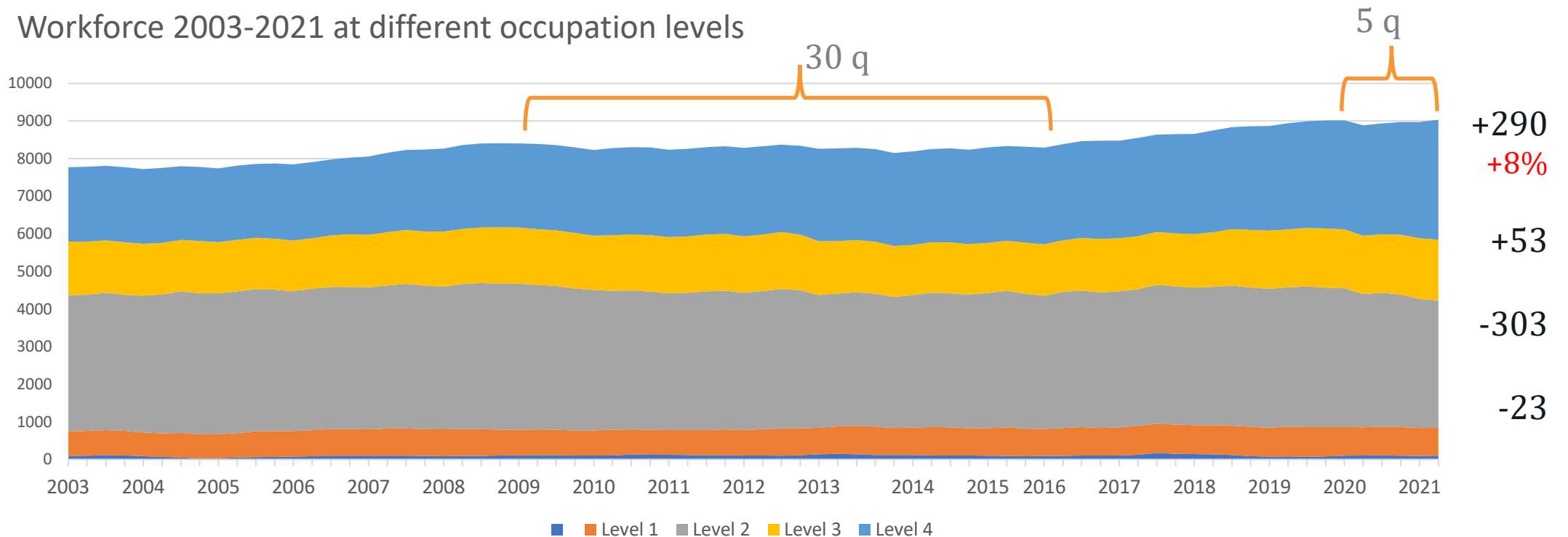- *February 24, 2022* Ukraine invasion creates another economic shock

Our collective history of the last crisis: high shock

High impact of a shock gives room for adaptation to a higher (productivity) level
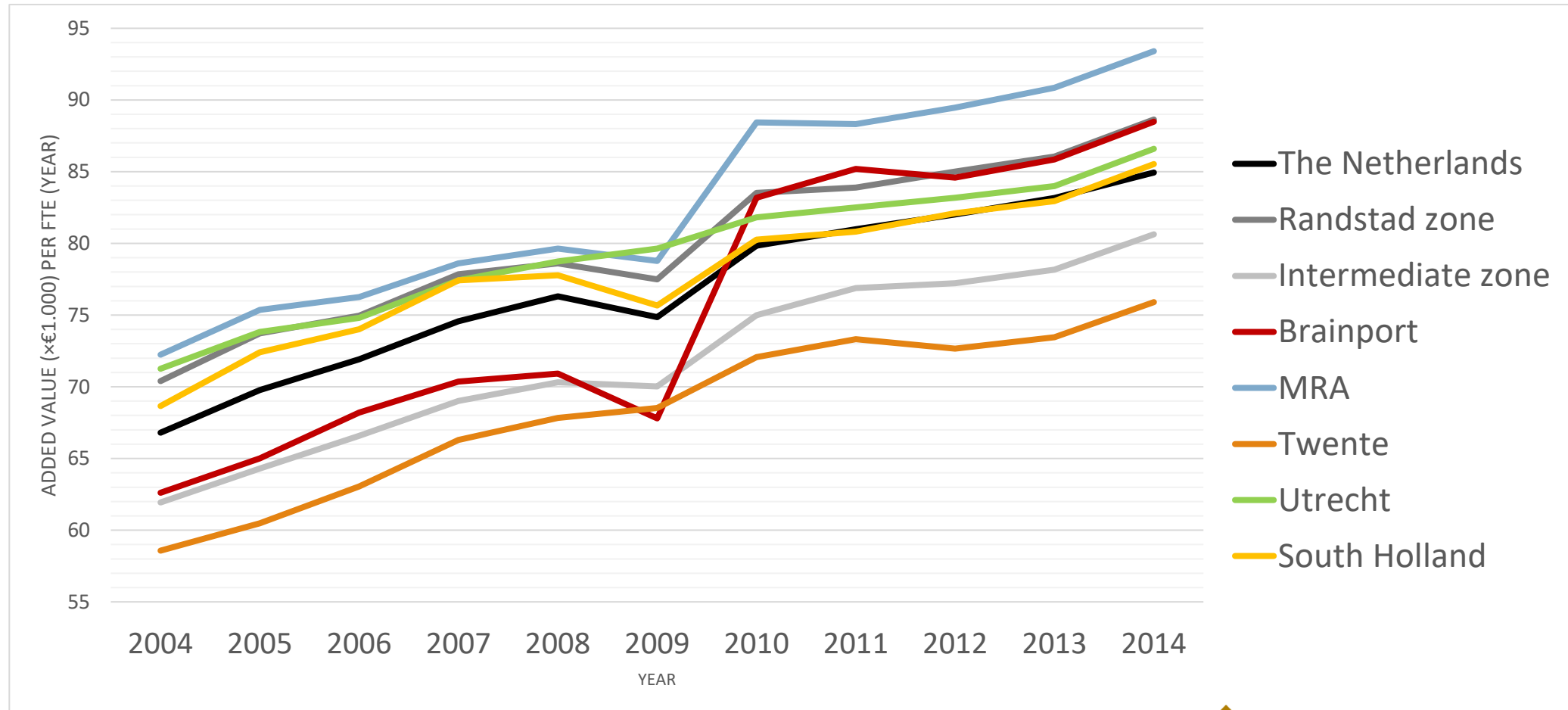
But in The Netherlands the Covid crisis just lasted 5 quarters

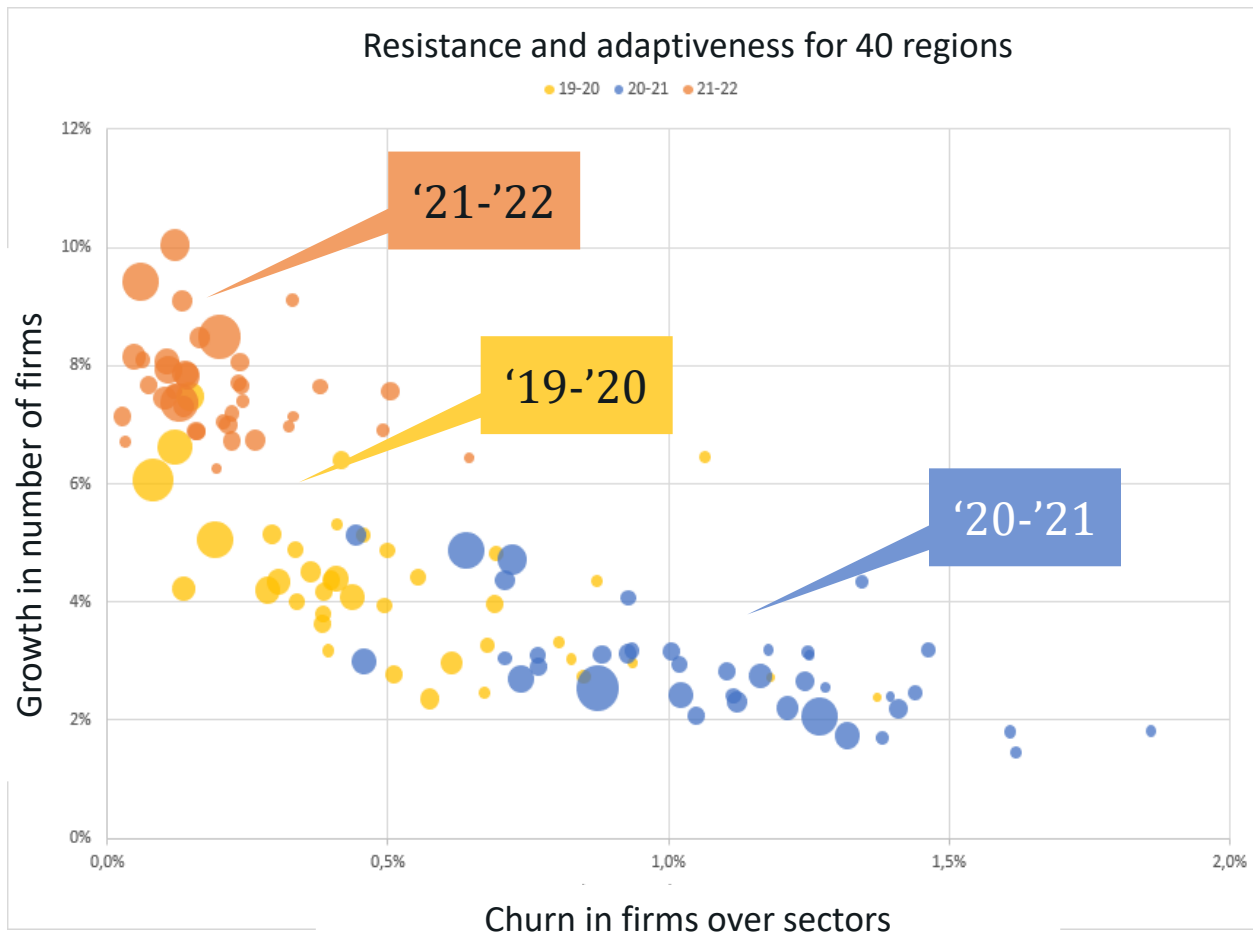Workforce 2003-2021 at different occupation levels

The total growth of net 19 thousands persons in five quarters is the effect of growth in level 3 and level 4 and diminishing jobs in level 1 and especially level 2.

Niveau 4: zeer complexe taken, hbo/wo: leraar vo, musici, systeemanalist; 3: complexe taken: uitvoerder, vertegenwoordiger, jur. Secretaresse; 2: tot middelmatig complexe taken: chauffeur, adm. medewerker, automonteur; 1: eenvoudig routinematig lichamelijk/handmatig werk: glazenwasser, bollenpeller keukenhulp

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Resistance and adaptiveness in firms

A crisis accelerates change in the dynamics of companies

Resistance and adaptiveness for 40 regions

● 19-20 ● 20-21 ● 21-22

Growth in number of firms (y-axis)

Churn in firms over sectors (x-axis)

'21-'22

'19-'20

'20-'21

- Resistance = growth of the number new companies between (the start of) the two years. Growth in the number of companies signals resistance.

- Adaptiveness = change in sectoral composition of companies in the same period. A more changing sectoral composition signals adaptiveness ('churn'). We have divided firms over 79 sectors.

- In a regular year the churn is between 0% and 1,5% on top of the growth in companies. The first covid year the churn was quite higher with a mean of 1%. In '21-'22 the churn slowed down and dropped below 0,5%.

- **This indicates that a crisis, forcefully, rearranges the portfolio of companies over sectors. After a crisis the composition doesn't change with the same velocity, but changes slowly out of the after-crisis-composition.**

Churn is a measure of the change in composition in firms. It is calculated by the sum of the absolute delta of firms in each sector between two times divided by the total number of firms in region. Thus, the higher the churn, the more the composition of firms has changed at t+1 compared to t. When comparing regions, we use the excess churn. We correct churn with the existing total growth rate to reflect the rate of change in firm composition that does not contribute to regional growth.
Based on Findeisen & Südekum (2008). Industry churning and the evolution of cities: Evidence for Germany. Journal of Urban Economics 64 (2008) 326–339.

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Qualitative research: what do firms experience and do?

Entrepreneurial Ecosystem quality is experienced by firms
3 out of 10 innovative firms enhance their innovation during crisis

1.5 m distance rule relevant

National focus (left axis) — **International focus** (right axis)

National and 1.5 relevant	International and 1.5 relevant
69/10 → 2	69/15 → 2
Construction, energy	Hospitality, industry
SBC: differentiation, cost leadership	SBC: differentiation
SDC: persevering	SDC: persevering, innovation
EE: Leadership (-/+) Finance (-)	EE: Talent

National and 1.5 less relevant	International and 1.5 less relevant
69/26 → 3	69/18 → 3
ICT	ICT, hospitality
SBC: differentiation	SBC: differentiation
SDC: innovation (2), persevering	SDC: persevering
EE: Talent (-) Intermediaries (+/-)	EE: Leadership (-/+) Finance (-)

1.5 m distance rule less relevant

10 firms
4 categories
4 strategies during crisis (SDC)
- retrenchment (narrowing business activities),
- persevering (sustaining business activities),
- innovation (expanding business activities),
- exit (exiting business activities).

6 elements of the EE: network, leadership, finance, talent, knowledge, and intermediaries
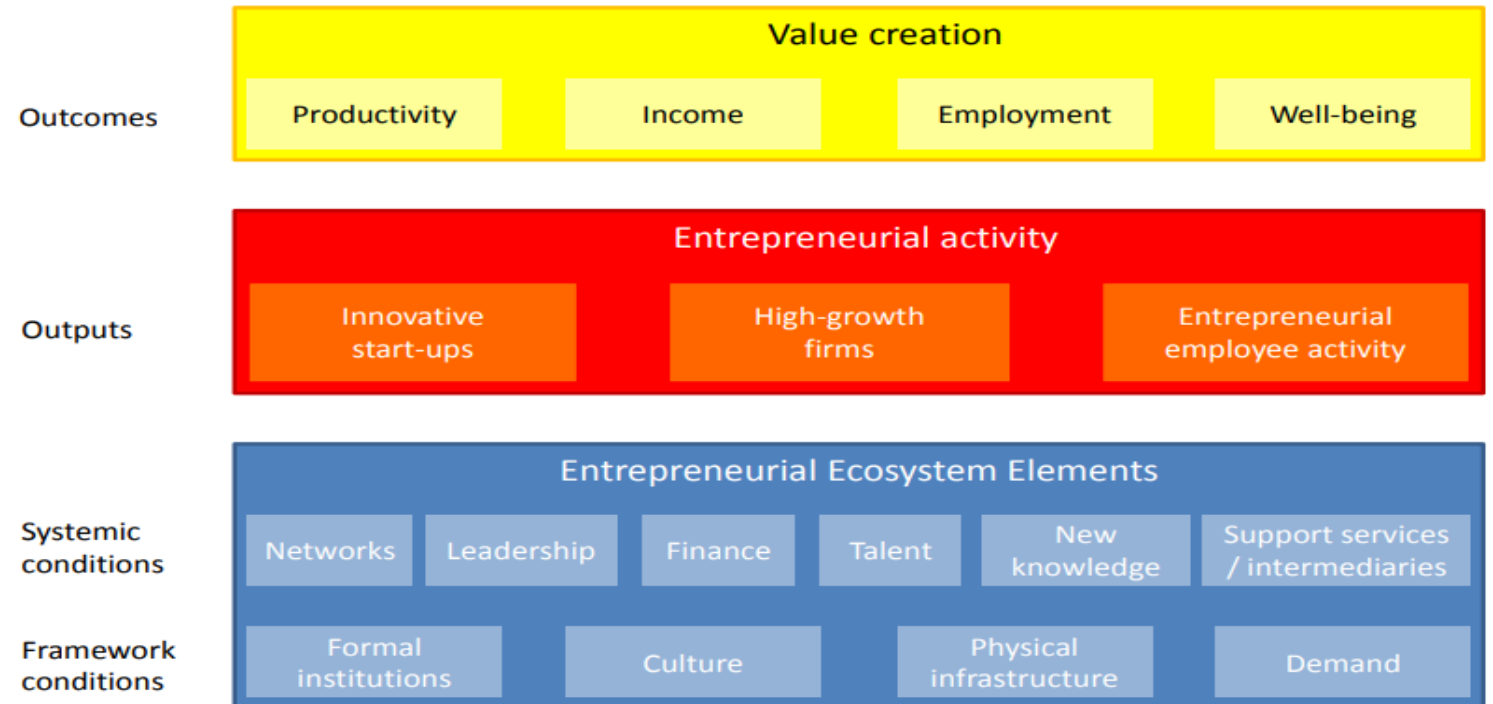
Using an algorithm, a list of innovative vacancies was selected. After correcting for the duplicate companies and deleting the job-intermediaries, there was a list of 225 companies. All the 225 companies were checked if they could be seen as innovative companies by looking at their websites. Innovative companies had for example innovative vacancies, innovative products, innovative culture, and innovative processes. Removing the non innovative companies and deleting the companies that didn't exist any more there a list of 69 companies resulted.

Typology based on Kraus, S., Clauss, T., Breier, M., Gast, J., Zardini, A., & Tiberius, V. (2020). The economics of COVID-19: initial empirical evidence on how family firms in five European countries cope with the corona crisis. International Journal of Entrepreneurial behaviour & Research. Based on Anja Fehres, The impact of the COVID-19 crisis on the business strategy of companies in Noord-Brabant. Thesis 2022.
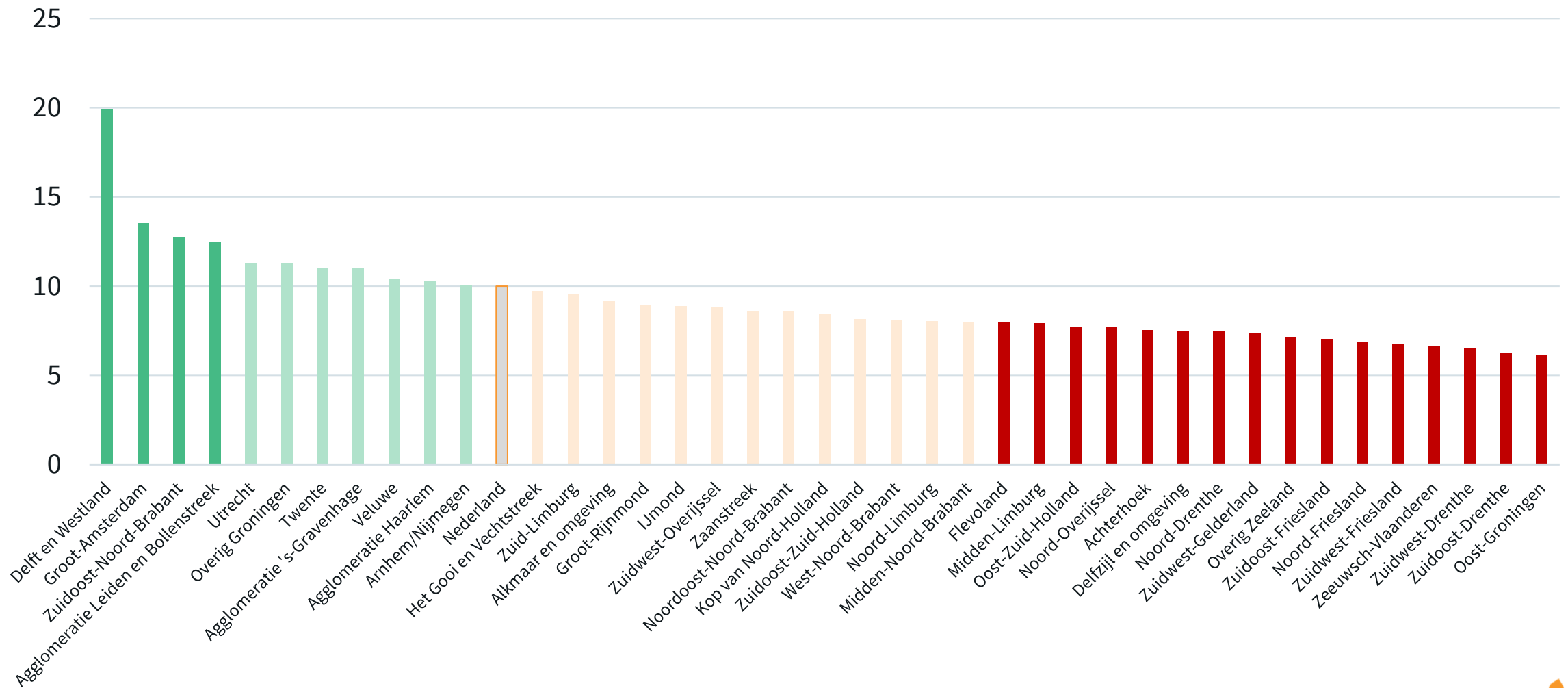
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Entrepreneurial Ecosystem

In the *Entrepreneurial Ecosystem* the economy is seen as an dynamic network of actors and factors. Entrepreneurship is the process where individuals identifies opportunities and are creating new value. The strength of an ecosystem decides if individuals succeeds in this.
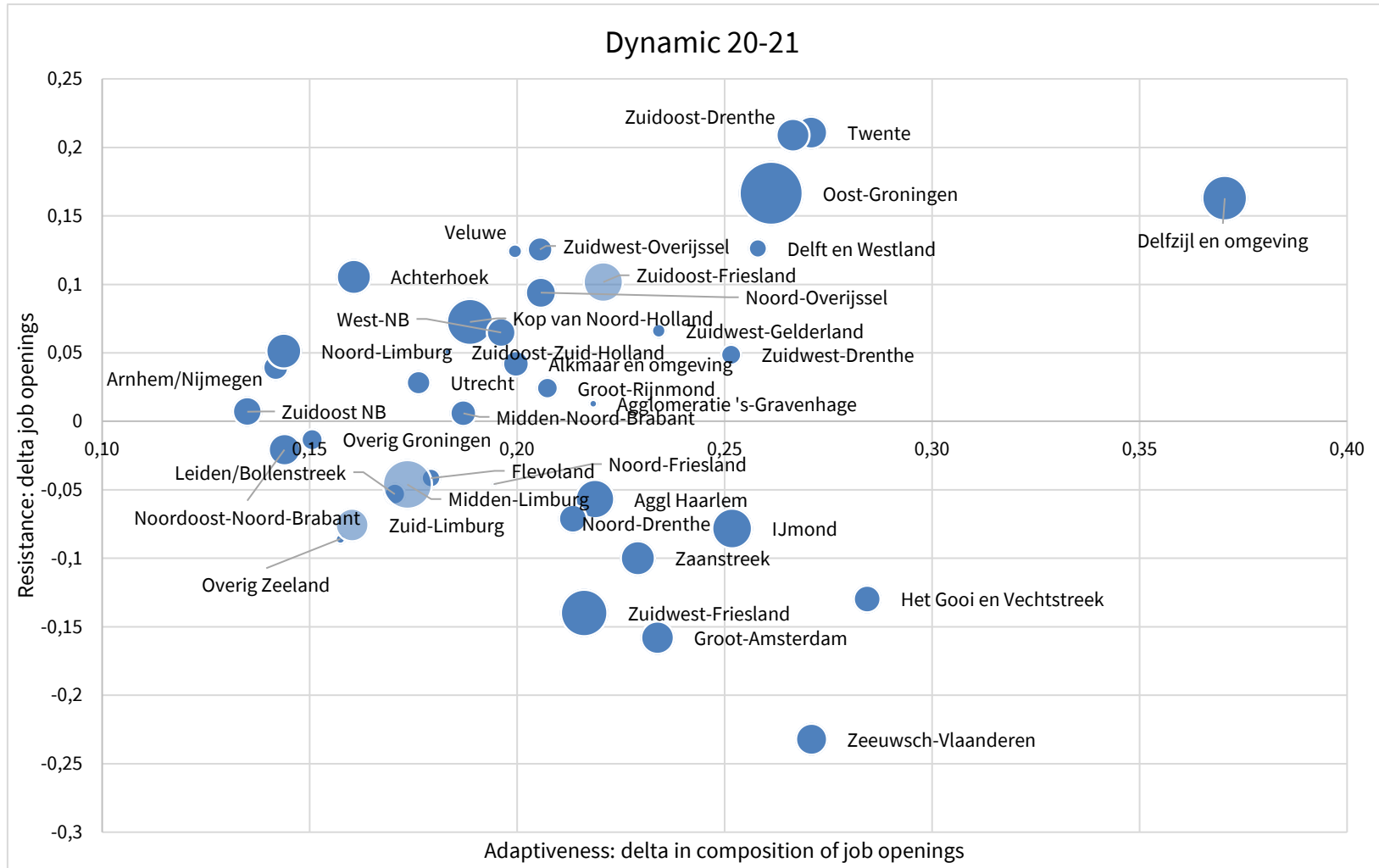
We suppose that regions with a higher quality of their entrepreneurial Ecosystem are able to adapt their economy faster.

Stam & Spigel 2014

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We can also rank regions by data on the elements of their EE (2020)

Stam, F. C., & Van der Starre, B., Hendricksen, T en Van den Toren, J.P., Entrepreneurial Ecosystem Index. Wendbaarheid in tijden van Covid -19. Utrecht University/Birch 2022.

Resistance and adaptiveness

Dynamic 20-21

Resistance = Growth of the number of job openings between two quarters. A higher number of job openings signals a recovering economy.

Adaptiveness = Change of the composition of occupations in vacancies between two quarters. More change in the composition is a signal of adaptiveness.

The size of the dots shows the growth of the highest occupation level

Churn is a measure of the change in composition in vacancies. It is calculated by the sum of the absolute delta of vacancies in each occupation group (o) between two times (t) divided by the total number of vacancies (v) in region (r). Thus, the higher the churn, the more the composition of vacancies has changed at t+1 compared to t. When comparing regions, we use the excess churn. We correct churn with the existing total growth rate to reflect the rate of change in vacancy composition that does not contribute to regional growth.

Resistance and adaptiveness and Entrepreneurial Ecosystem 2020
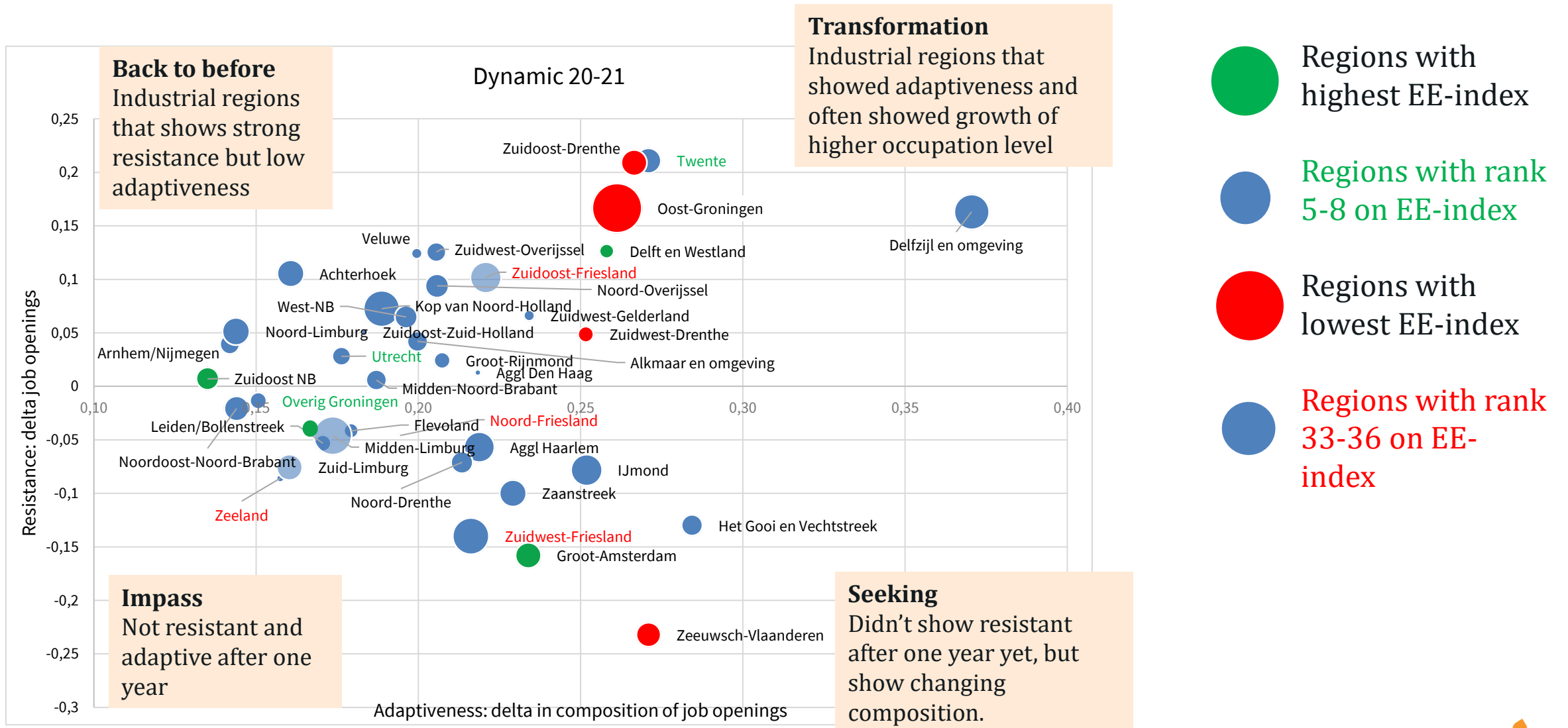
Diving into vacancy data and texts

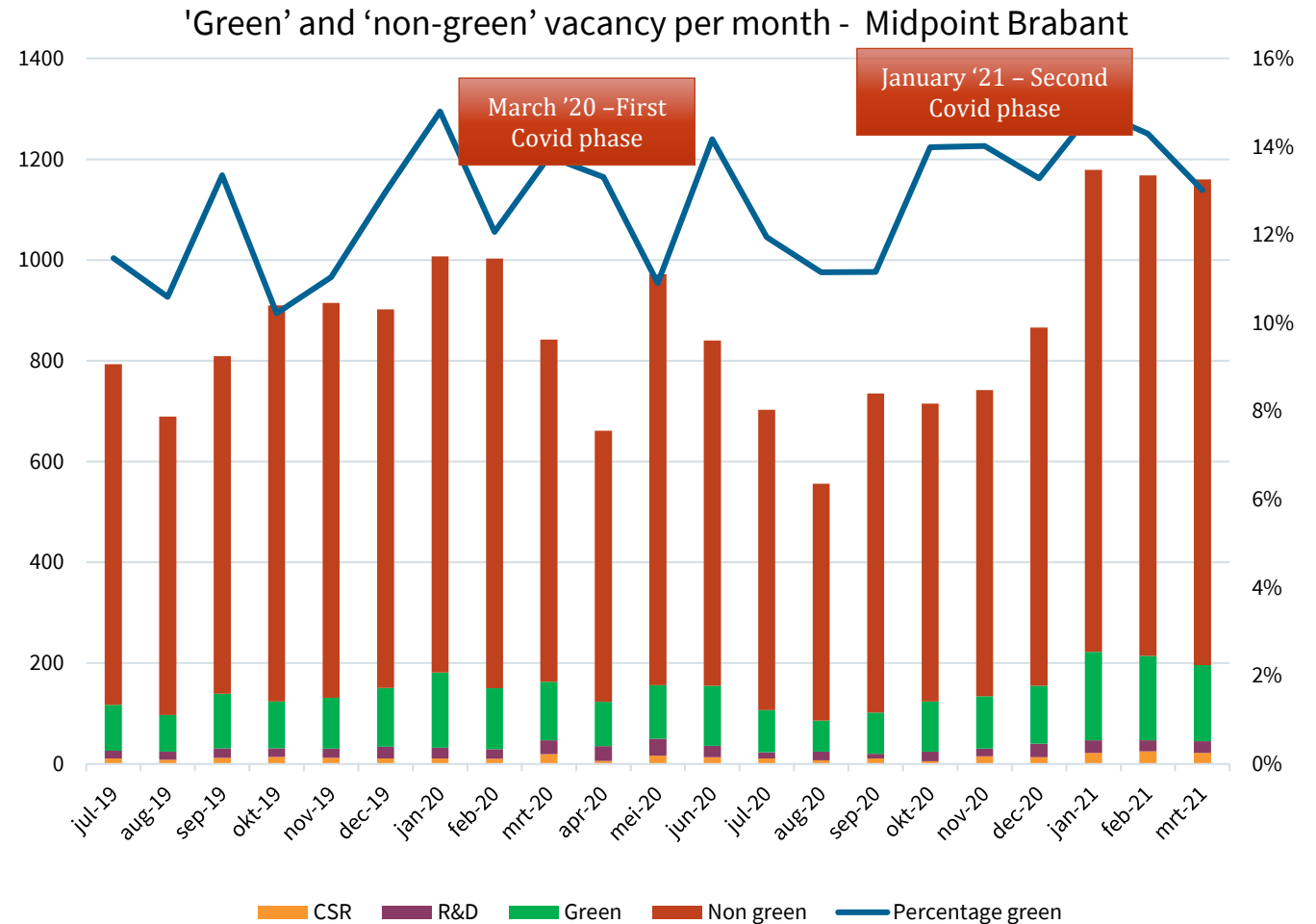## Monitoring the pandemic through online vacancy data – two examples

- Vacancy data give insights in the dynamics of the labour market and what direction the market goes. Also by comparing vacancies in different periods we can find different composition of vacancies.

- Method of finding vacancies is via scraping the internet for vacancy data by Jobdigger

- We monitored two regions in the Netherlands, Southwest Flevoland and Midden Brabant.

- We used basic text mining to identify transitions in vacancies and which companies are 'leading' those transitions.

	Midden Brabant	**Southwest Flevoland**
#vacancies	18.436	15.262
#companies	3.600	2.612
Period	Juli 2019 – March 2021	Juni 2019 – Juni 2021
Other variables	Sectors, job titles, education level, location (municipality, zip-codes, coordinates, contract type)	

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The course of 'green' vacancies during the corona crisis in a region
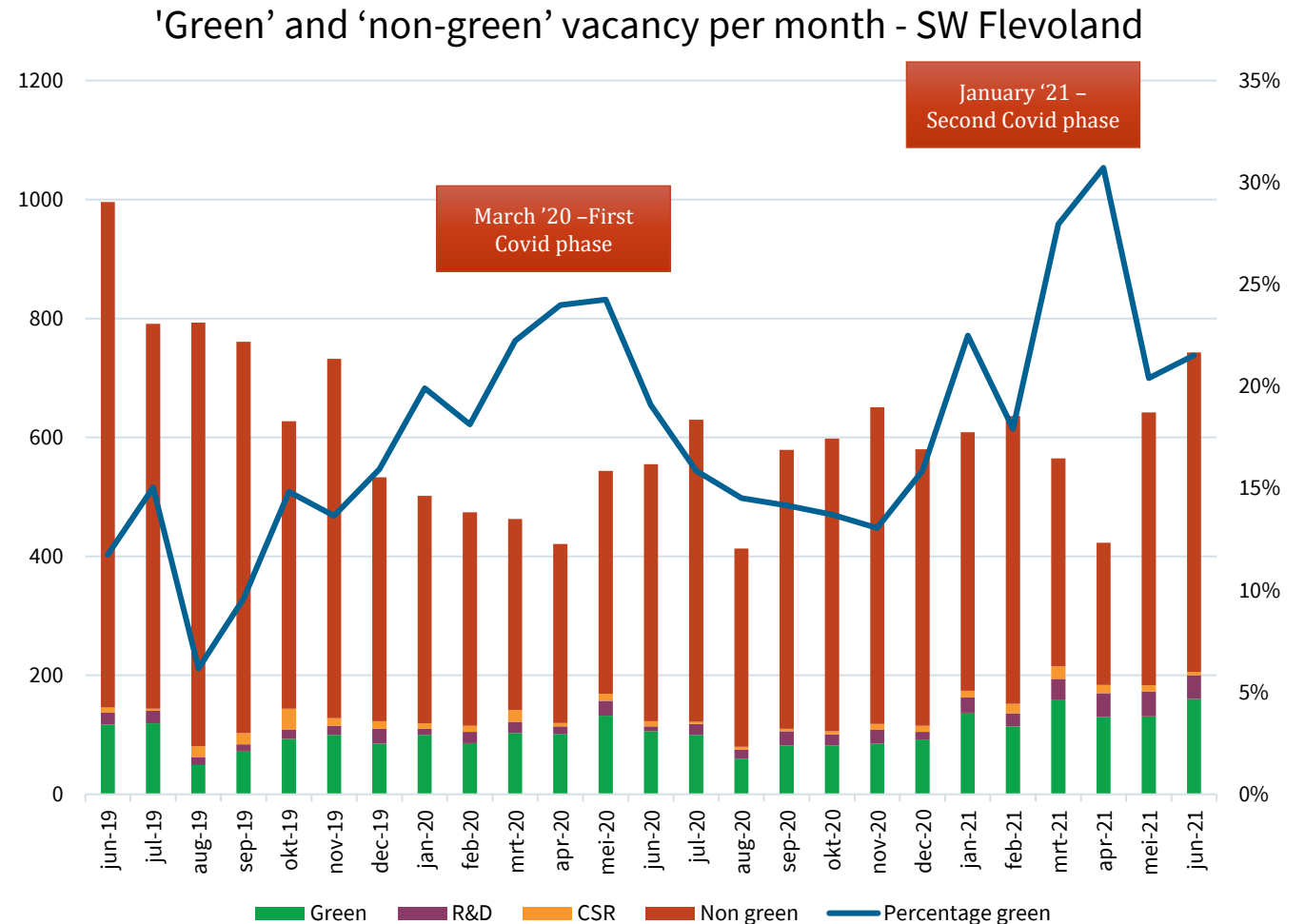
Midden-Brabant

- The graphic shows the development of vacancies in a period of two years. The vacancies have been divided in green, R&D, CSR and non green vacancies. Combined are the total vacancies. We see the decline in the number of vacancies in the first covid phase and the recovery in the second phase (where the covid measures loosened in the Netherlands).

- The number of 'green' vacancies fluctuates between 14% and 19%.

- We see that green vacancies diminished later than other vacancies. Green and innovative jobs/firms are less harmed, but not excluded from the crisis.

- Causality can be measured by regressions.

'Green' and 'non-green' vacancy per month - Midpoint Brabant

March '20 – First Covid phase

January '21 – Second Covid phase

Legend: CSR, R&D, Green, Non green, Percentage green

Source: Jobdigger & Dennis Raats: *The effect of firm size and international orientation of a firm on green job intensity, and the impact of COVID-19 and sustainability trends on this relationship.* (2022). Graph: Birch. CSR: Corporate Social Responsibility

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The course of 'green' vacancies during the corona crisis in a region

Southwest Flevoland

- Same trend as in Brabant but we see a higher share of 'green' vacancies in Flevoland.

- The number of 'green' vacancies fluctuates in these months between 6% and 31%.

'Green' and 'non-green' vacancy per month - SW Flevoland

January '21 – Second Covid phase

March '20 – First Covid phase

Green   R&D   CSR   Non green   Percentage green

Based on analysis by Abdulkader Abdullah. Graph: Birch

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Terms used for finding 'green' vacancies

Green: Climate (1)	Green: Climate (2)	Green: Resource management	R&D	CSR
CO2	Ecological footprint	Energy management	Transition	CSR
Emission(s)	Climate	Recycle	R&D	Corporate Social Responsibility
CO2 Emissions	Climate change	Circularity	Research and development	Social Responsibility
Carbon emissions	Biodiversity	Circular economy	Change management	
Energy neutral	Environmental protection	Water management		
Energy transition	Climate goals	Waste management		
Environment	Environmental engineering			
Sustainability				

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Conclusions and discussion

What do you think?

1. In the 2008-2014 crisis, effective entrepreneurial ecosystems in combination with redundancies in the financial and manufacturing sector, supported adaptation to a higher level.

2. In the 2020-2021 COVID crisis: (1) huge government support and (2) uncertainty about the duration of the crisis, made that most firms choose for perseverance instead of innovation.

3. High-networked regions with knowledge intensive activities (so with a high-level entrepreneurial ecosystem) were able to sustain their actual innovation portfolio; weaker EE regions (in peripheral industrial regions) experienced a greater impact and showed more churn - to a higher level.

4. Analysis in two (below-average EE level) regions, shows that green and innovative jobs/firms are less harmed, but not excluded from the crisis.
   Regional intermediaries can now identify those firms that are relevant to support.

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Editorial

Thank you!

- Erdem Bagir
  erdem.bagir@birch.nl

- Jan Peter van den Toren
  janpeter.vandentoren@birch.nl

- J.P.vdnToren@tilburguniversity.nl

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