



Fear and Employment During the COVID Pandemic: Evidence from Search Behaviour in the EU

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Highlights

- People's economic anxiety increased substantially following the COVID-19 outbreak
- Unemployment-related fears jumped beyond those during the Great Recession
- Anxiety was substantially larger in those countries hit hardest in economic terms
- Contrary to the Great Recession, fears were not eased by short-time work schemes
- A coinciding slowdown in European labour markets and consumption is observed

Outline

1. The importance of (measuring) sentiment
2. Analysis
 - a. Data
 - b. Methodology
 - c. Results
3. Conclusion

Introduction

Uncertainty's impact on the economy

Forward-looking correlations: **sentiment is driver of activity**

- Reduce growth through increasing **risk premia** raising cost of financing (cf. Tobin)
- Make firms cautious about actions like investment and hiring, since their (S-shape) **adjustment costs** often make reversion expensive (Bloom, 2009)
- Affect **households' expectations** and, by consequence, their precautionary savings, consumption and investment (Ben-David et al., 2018; Roth and Wohlfart, 2020)
 - Unprecedented surge in EA saving rates, from 12.7% in the fourth quarter of 2019 up to 16.9% in the first quarter of 2020
- Lead to persistently high unemployment as the result of **steady-state indeterminacy**, so-called sunspots (Farmer, 2012; Benigno and Fornaro, 2017)

Challenges in measuring uncertainty

Challenges:

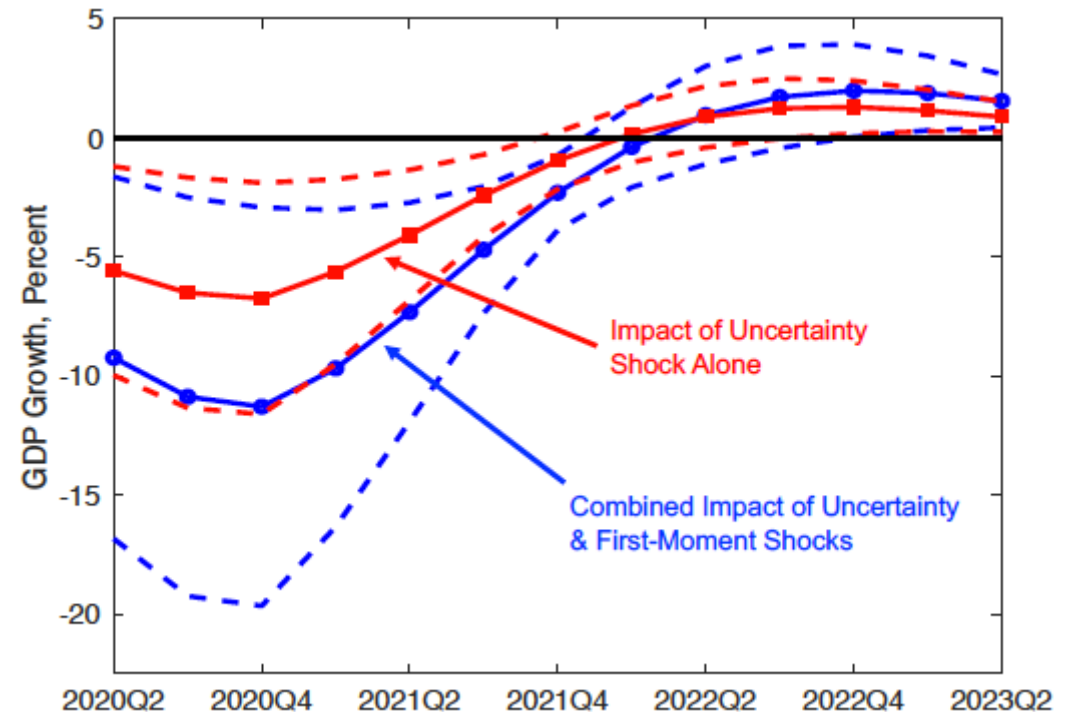
- distinction between self-fulfilling prophecies, animal spirits, news and noise
- Speed at which COVID-19 hit
- Lack of historic parallels for COVID-19

Traditional, backward looking measures of economic uncertainty derived from statistical models' fit to macroeconomic data are not well suited

- ▶ existing early-warning indicators in the policymakers' toolbox are being expanded

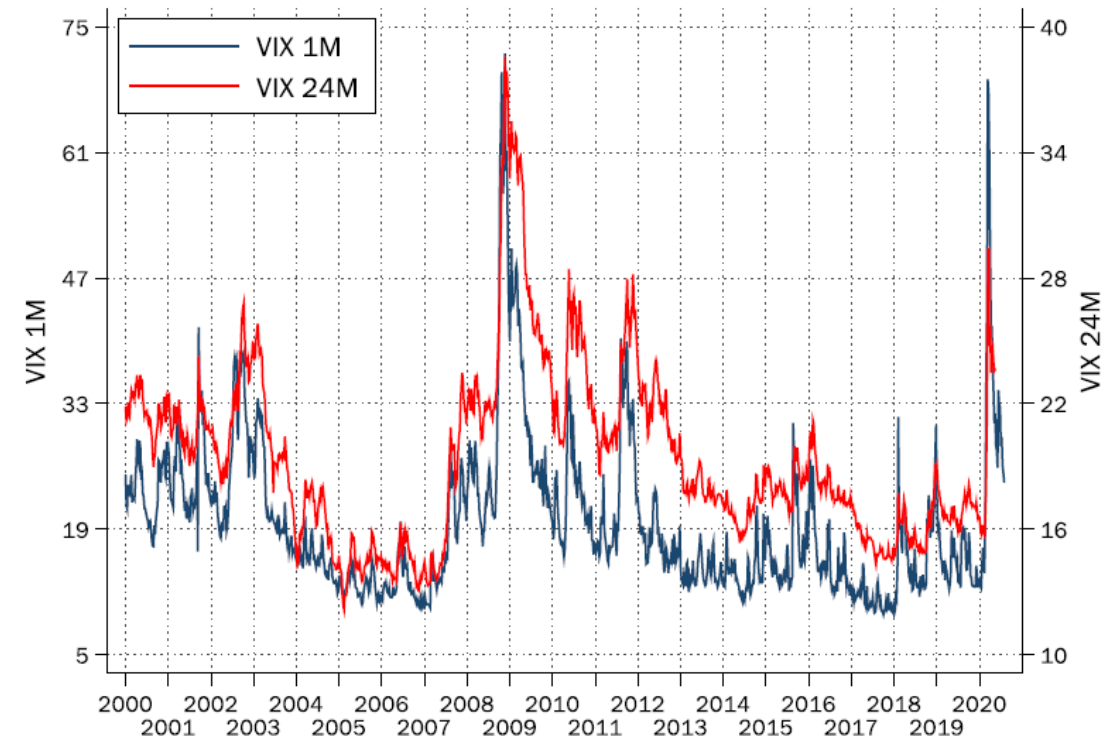
Measures of economic uncertainty

- **Statistical forecast uncertainty**
- Stock market volatility
- Newspaper/Twitter-based uncertainty
- Business expectation surveys
- Forecaster disagreement
- Google/Apple mobility data



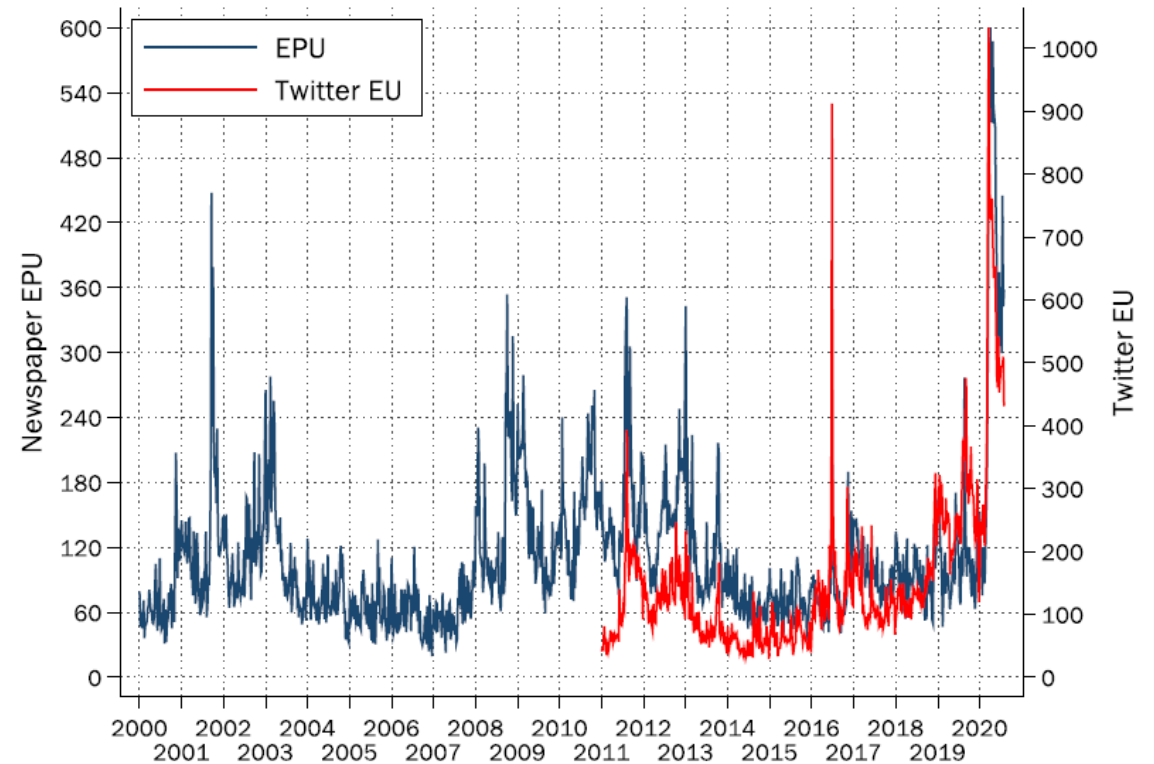
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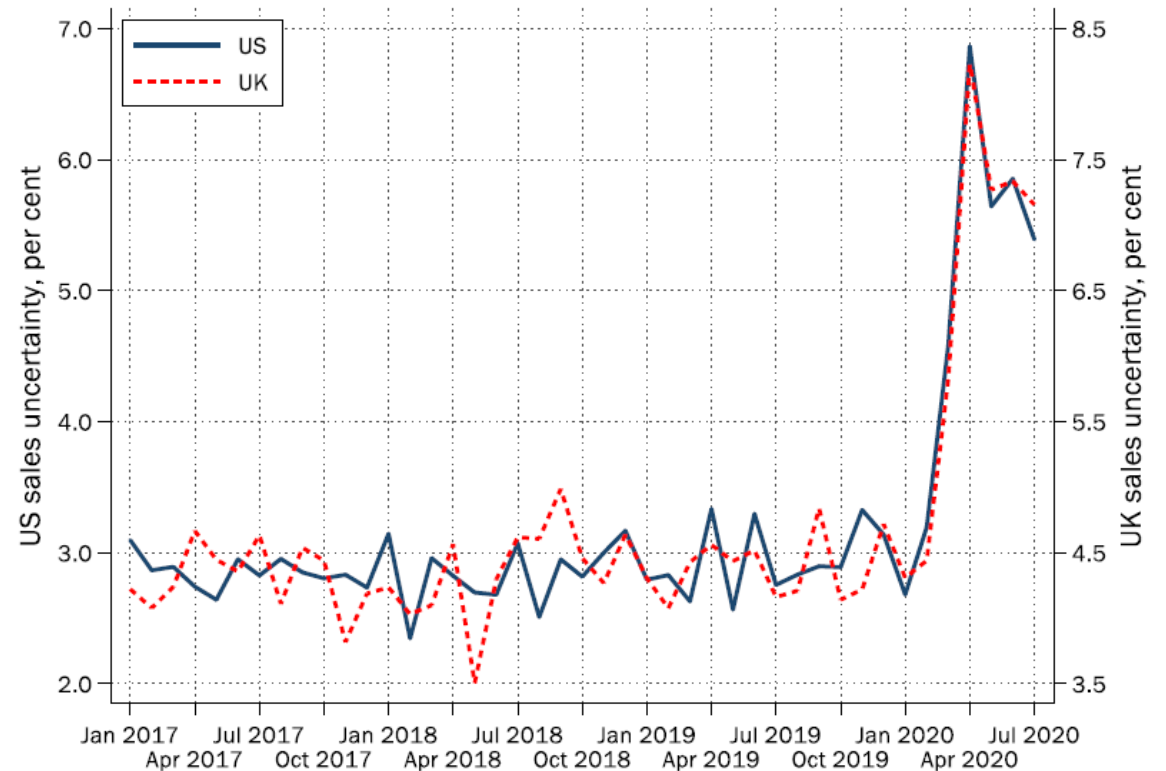
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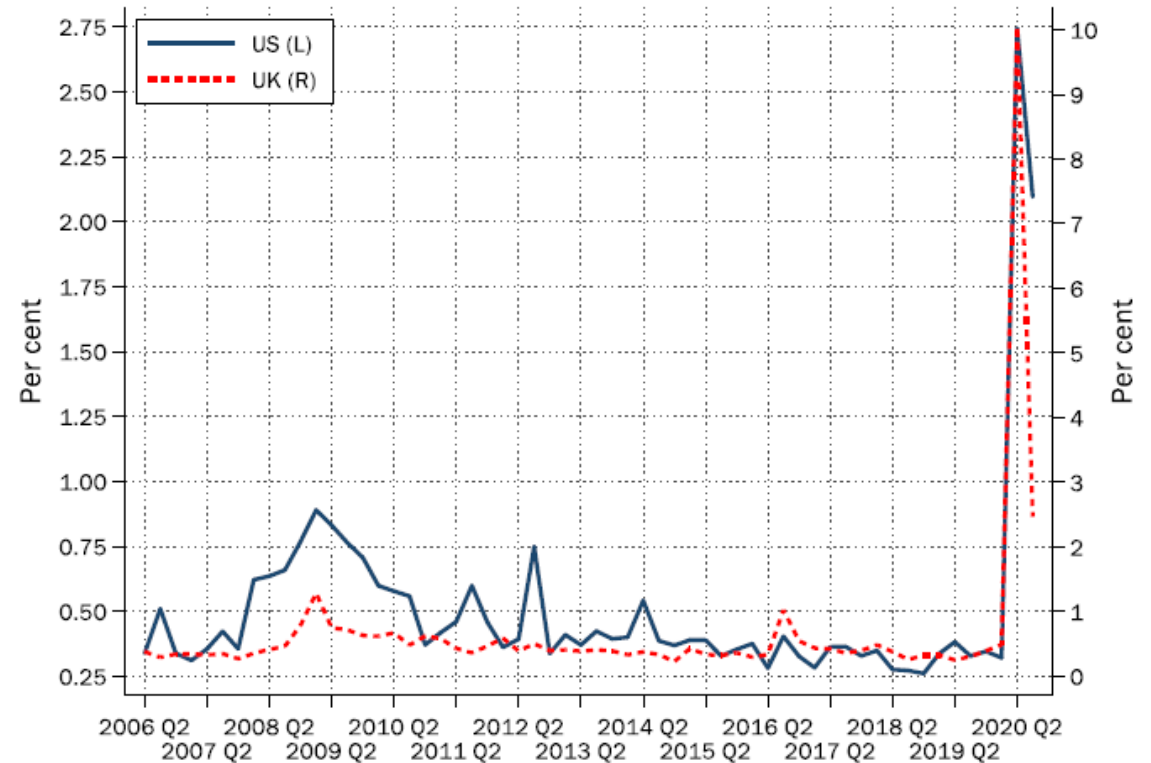
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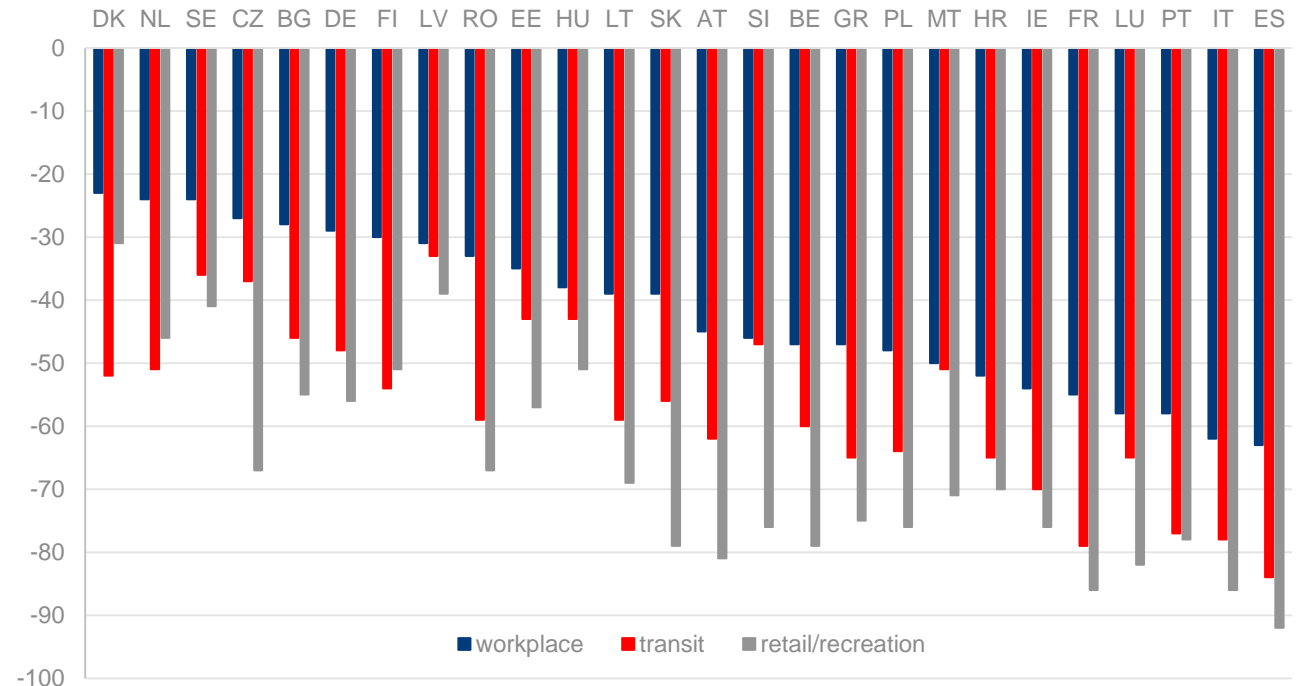
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Measures of economic uncertainty

- Statistical forecast uncertainty
- Stock market volatility
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- Forecaster disagreement
- **Google/Apple mobility data**
 - capture the impact of COVID-19 confinement measures
 - explain the spread of the pandemic
 - e.g. Iacus et al. (2020a,b), Santamaria et al. (2020)



Analysis

Data

Non-traditional data: Google Trends

- records the popularity of Google search queries
- across various regions and languages

Growing in popularity:

- detection of influenza epidemics (Ginsberg et al., 2009)
 - nowcasting economic activity (Choi and Varian, 2012; Koop and Onorante, 2019)
 - forecasting unemployment (Askatas and Zimmermann, 2009; D'Amuri and Marcucci, 2017) and private consumption (Vosen and Schmidt, 2011)
- Internet searches serve as a **measure of economic sentiment** among households and thus expectations (Fetzer et al., 2020)

Data



Commission using Google search data:

- as of May 2020
- to monitor citizens' health, economic and social isolation concerns
- 10 (almost) weekly reports
- https://ec.europa.eu/knowledge4policy/projects-activities/tracking-eu-citizens%E2%80%99-concerns-using-google-search-data_en

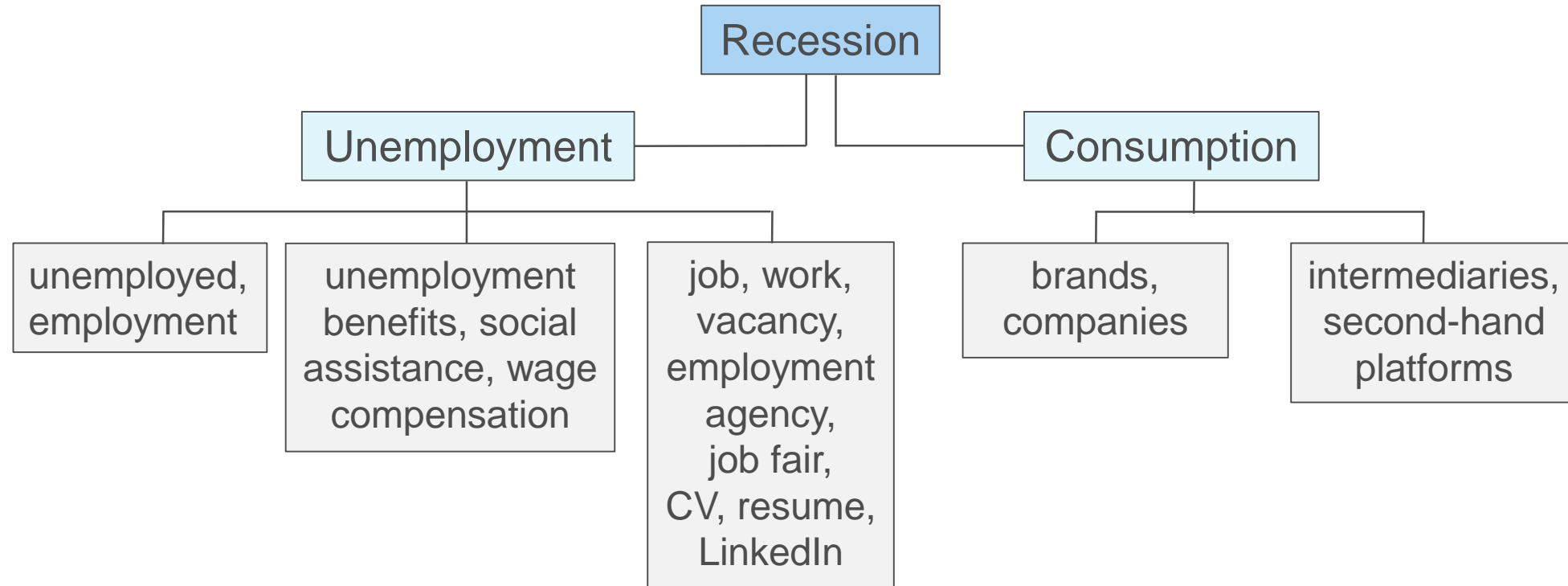
Data

Our data:

- language-specific search queries w.r.t. crisis, labour markets and consumption
- measure of search intensity scaled from 0 to 100, with 100 representing the highest proportion within the selected country/region and timeframe
- normalize the series by the mean search intensity prior to the surge of the coronavirus
 - coefficient estimates interpretable as percentage changes
 - baseline captures queries not solely driven by uncertainty (cf. focus on excess searches)
- three panels:

Coverage	Focus	Frequency	Time
EU27	country-level	monthly	since 2004
EU27	country-level	daily	Jan-Apr 2020
DE, ES, FR, IT	regional	daily	Jan-Apr 2020

Data

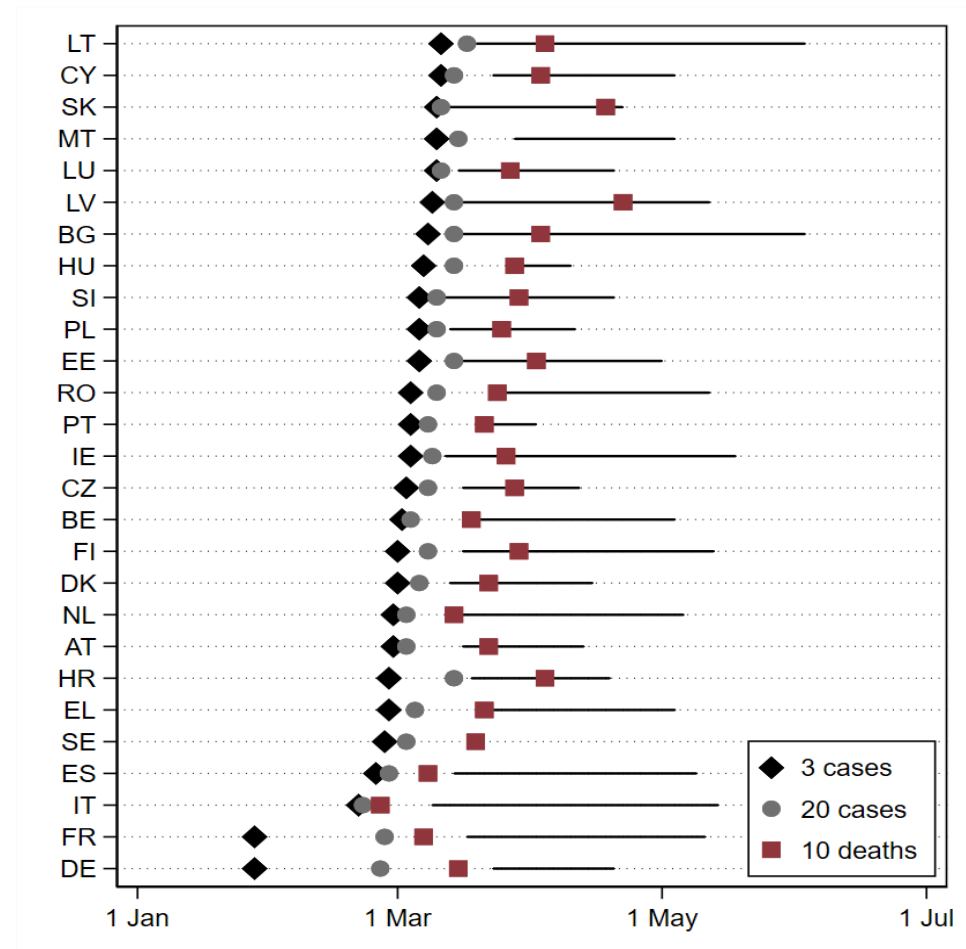


Data

Merge in (John Hopkins):

- number of confirmed cases
- number of active cases
- COVID-19 related deaths

Used to determine the pre and post-COVID outbreak period



Methodology

Estimate the following difference-in-difference (DiD) regression

$$y_{c,t} = \alpha + \sum_{\tau=-6}^6 \beta_{\tau} D_{c,\tau} + \epsilon_{c,t}$$

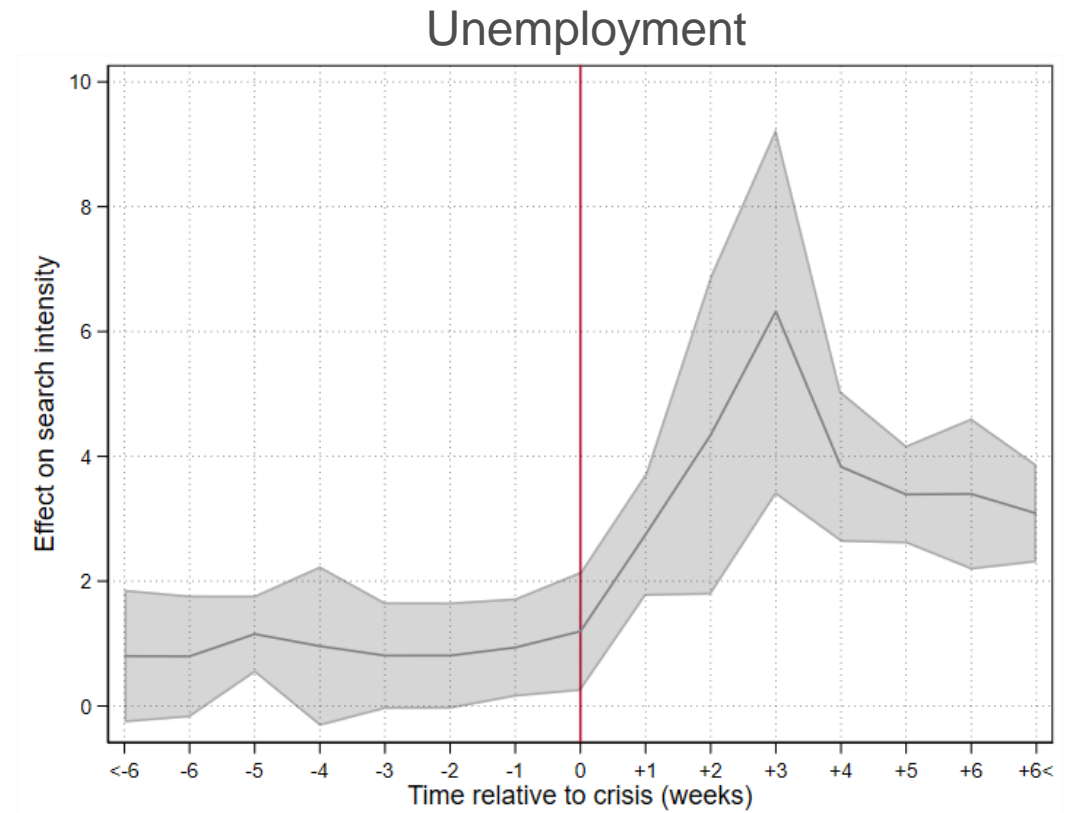
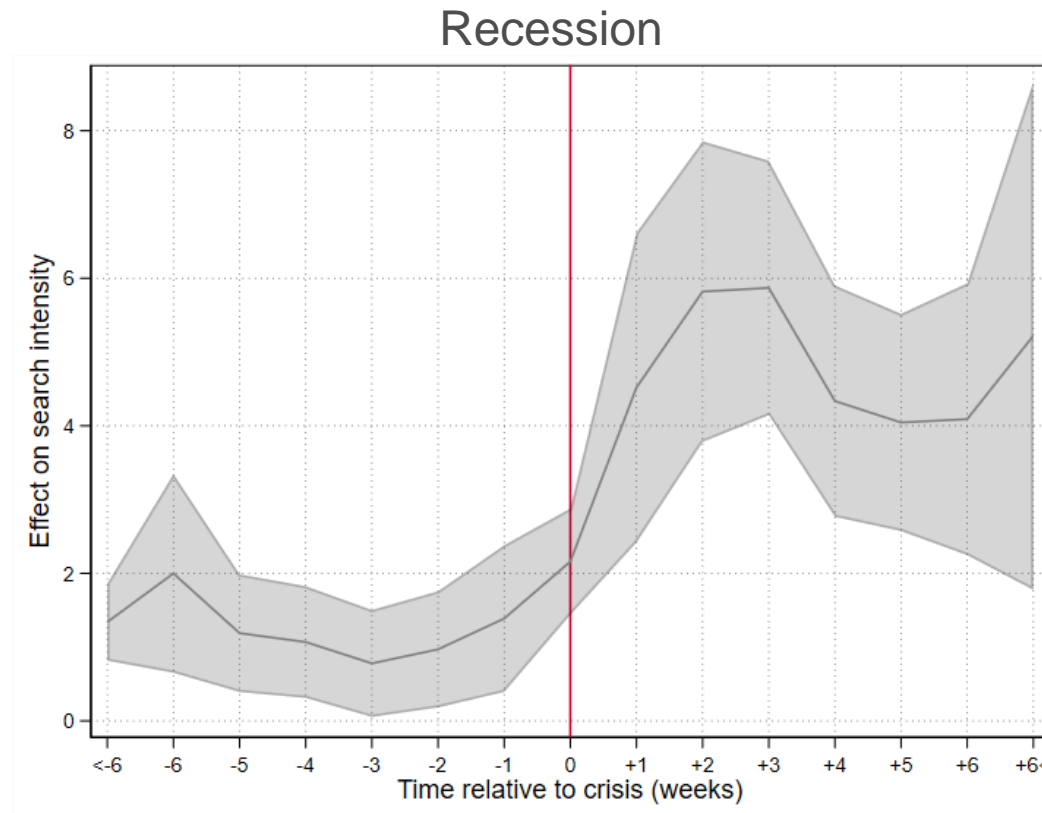
$y_{c,t}$ measures the search intensity in country (or region) c on day t

$D_{c,\tau}$ are relative week dummies centred around the arrival of the pandemic in the country

$\epsilon_{c,t}$ comprises panel fixed effects, time fixed effects and the error term

Alternatively, we performed Im-Pesaran-Shin tests for a unit root in the respective search series, confirming our conclusions.

Result 1 – Anxiety increased substantially



Result 2 – Fear higher in countries hit hardest

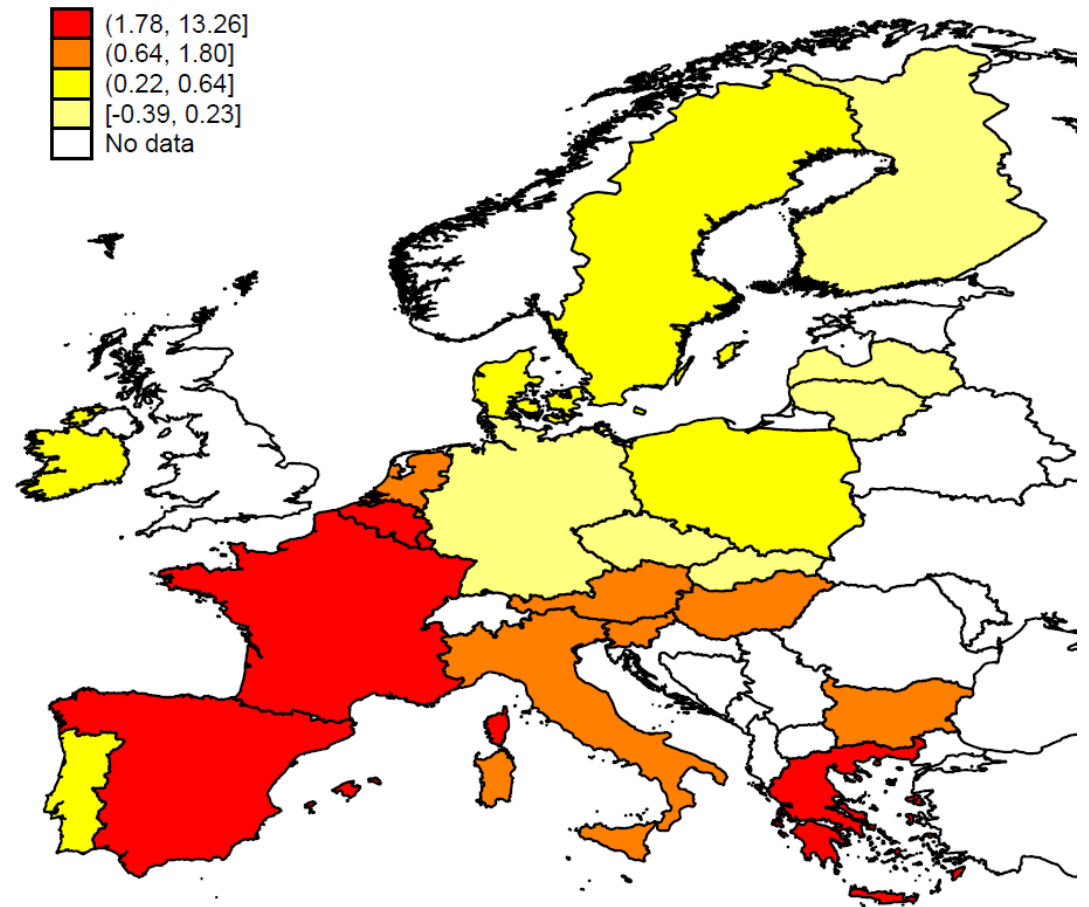
	Telework		Recession		Unemployment		Unemp. Benefit	
	(Hard)	(Rest)	(Hard)	(Rest)	(Hard)	(Rest)	(Hard)	(Rest)
Intercept	0.492 (0.669)	0.641** (0.208)	0.908* (0.455)	0.702*** (0.0705)	0.812 (0.471)	0.944*** (0.114)	0.950*** (0.120)	0.901*** (0.0959)
Cut-off dummy II (# deaths > 10)	4.088** (1.400)	1.287** (0.498)	4.124** (1.726)	0.574*** (0.188)	2.180** (0.904)	1.165*** (0.293)	0.690** (0.218)	1.087*** (0.196)
Day Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	8.549	12.276	5.378	15.037	16.885	18.559	4333.595	7.705
p-value	0.006	0.000	0.015	0.000	0.000	0.000	0.000	0.000
Goodness-of-fit	0.300	0.103	0.116	0.041	0.194	0.133	0.207	0.174
N° of observations	784	1078	882	1470	882	1666	882	1568
N° of countries	8	11	9	15	9	17	9	16

Notes: The dependent variable is the seven-day moving average search intensity for country-specific terms (telework, recession, unemployment and unemployment benefit), normalized by the mean search intensity before the COVID-19 outbreak. Cluster-robust standard errors are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

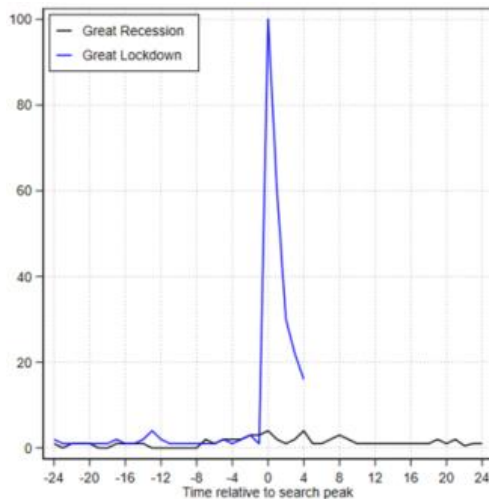
Result 2 – Fear higher in countries hit hardest

Reflects to some extent the pre-crisis performance of country-specific labour markets:

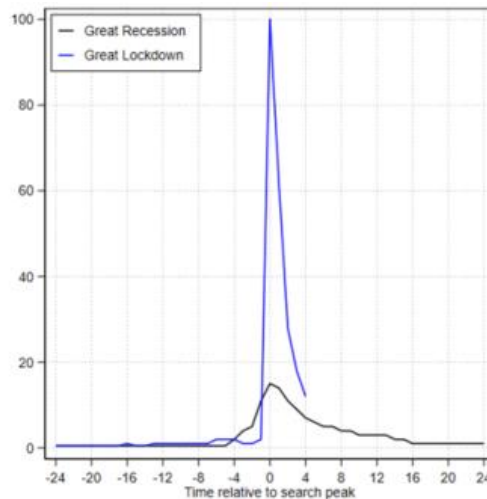
- perceived risk of unemployment is especially high in countries with high pre-crisis level of unemployment
- red: 10.3% aver. unempl. rate
- orange: 7.5%
- dark yellow: 4.7%
- light yellow: 3.4%



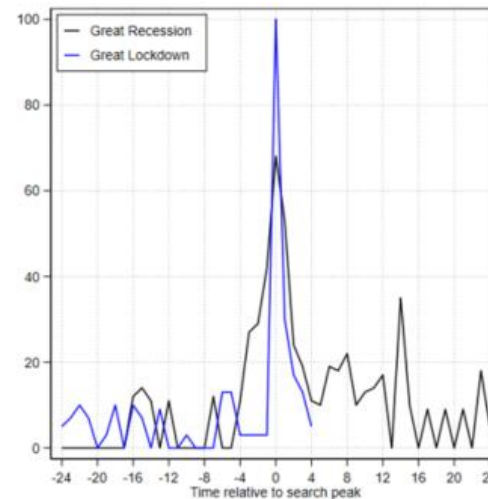
Result 3 – Renewed attention for STWs ...



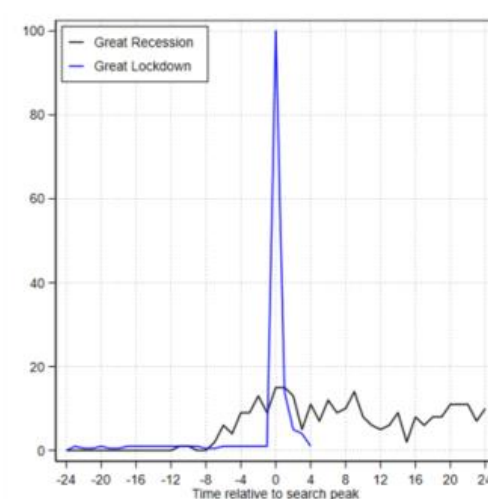
(a) BE – Tijdelijke werkloosheid



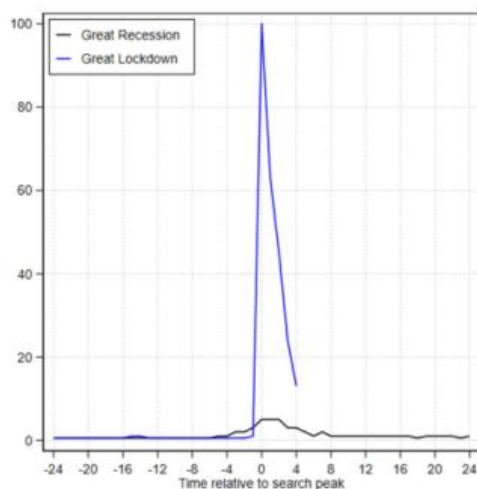
(b) DE – Kurzarbeit



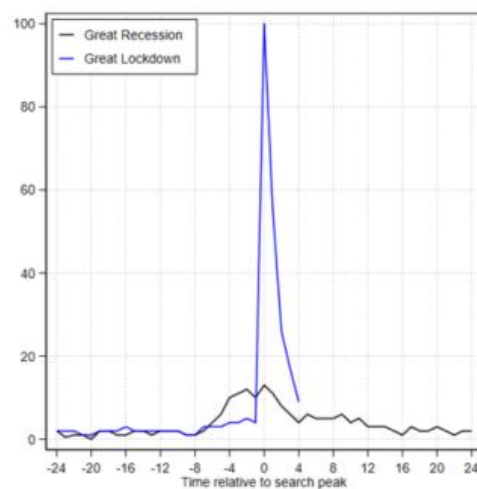
(c) DK – Arbejdsfordeling



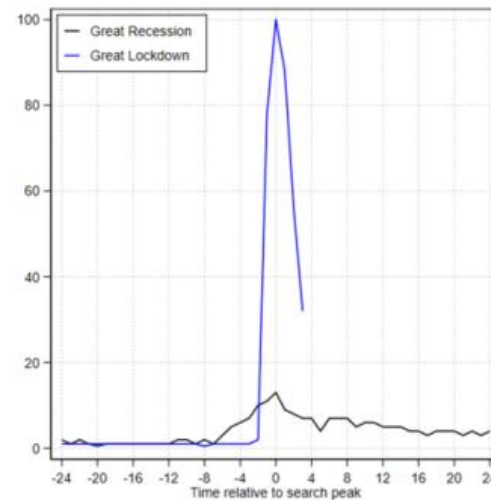
(d) ES – ERTE



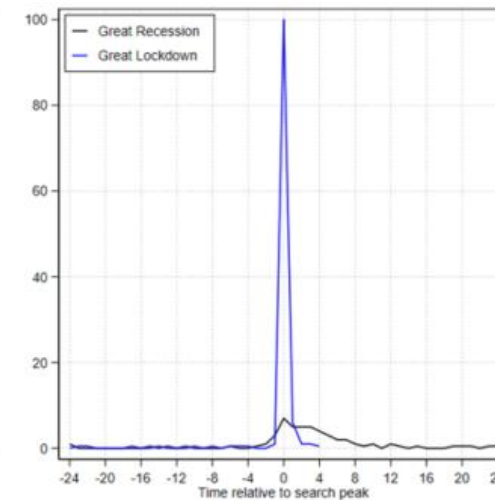
(e) FI – Lomautus



(f) FR – Chomage partiel

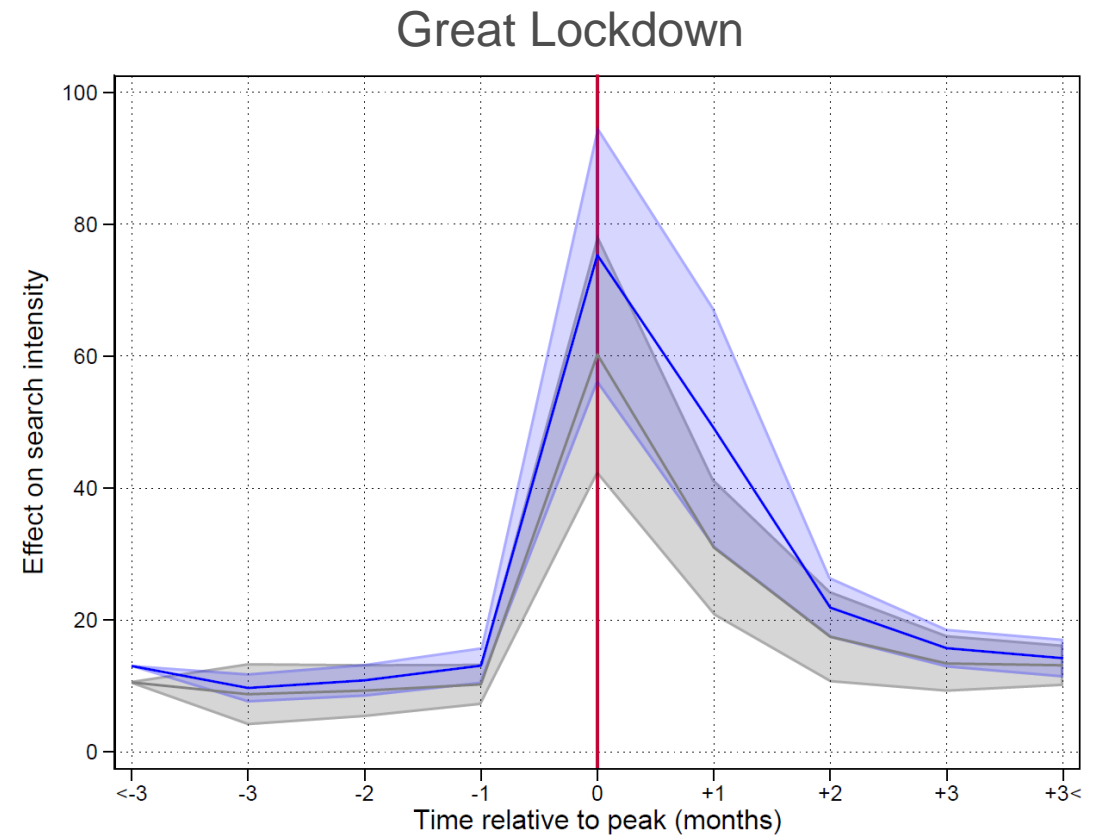
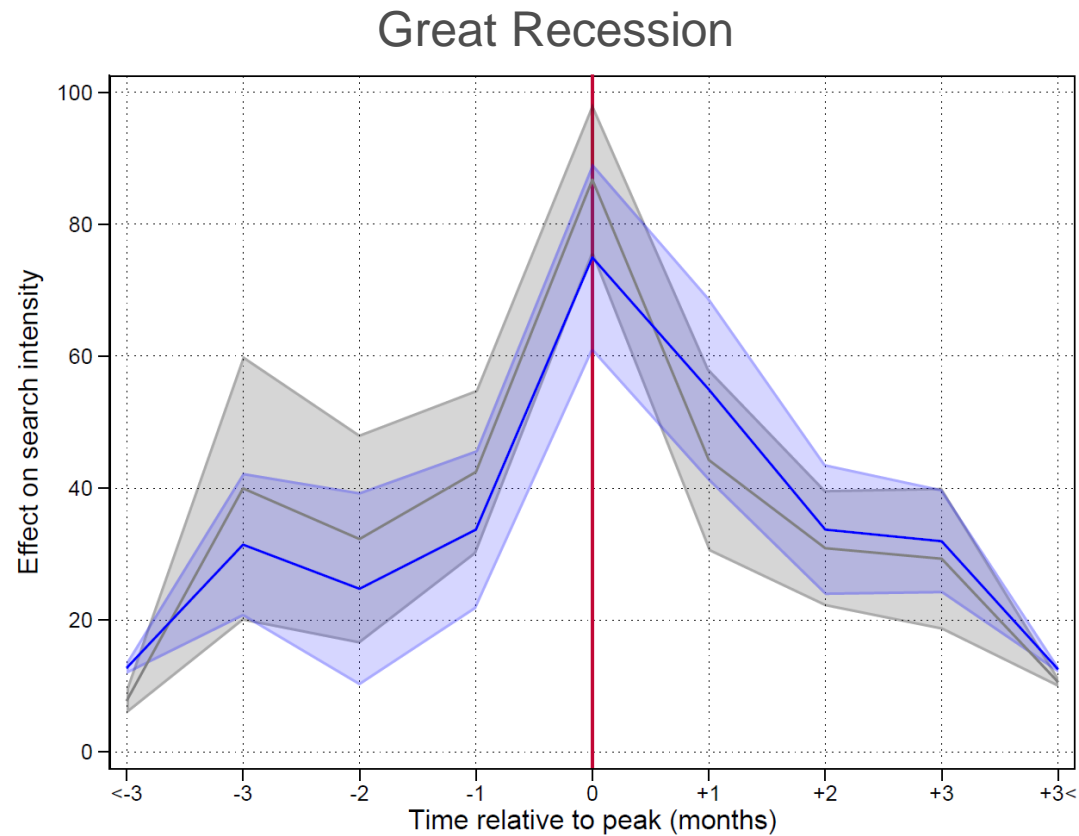


(g) IT – Cassa integrazione



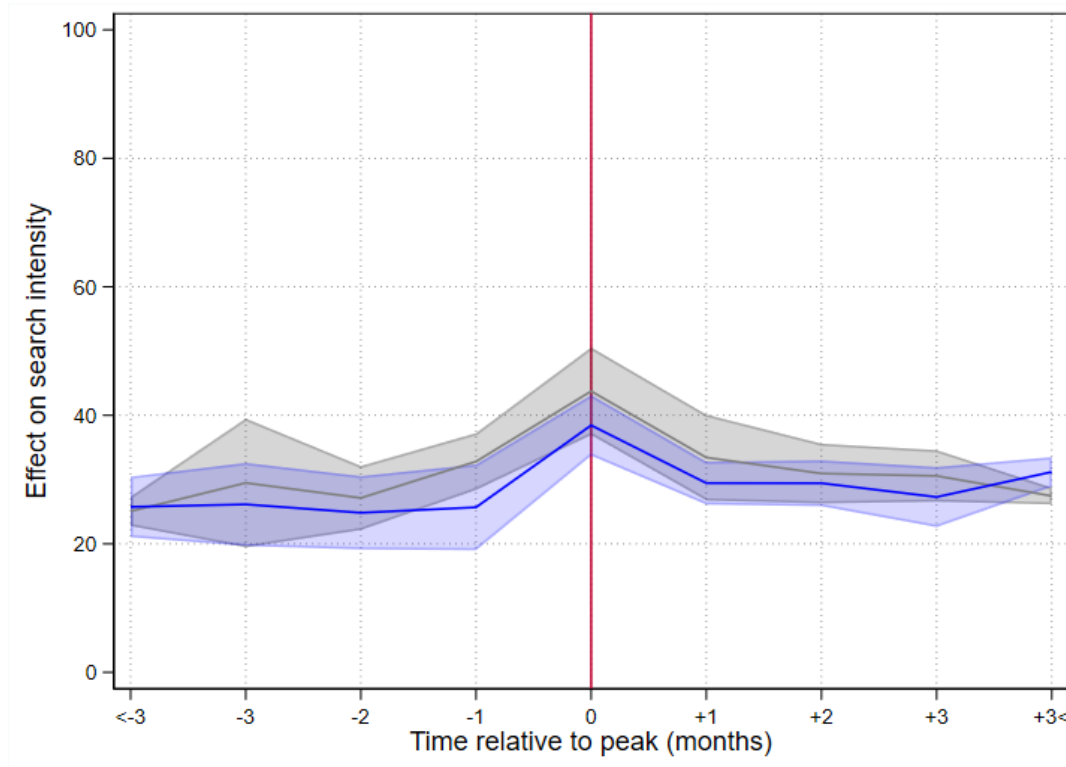
(h) NL – Werktijdsverkorting

Result 3 – ... did not ease recession fears

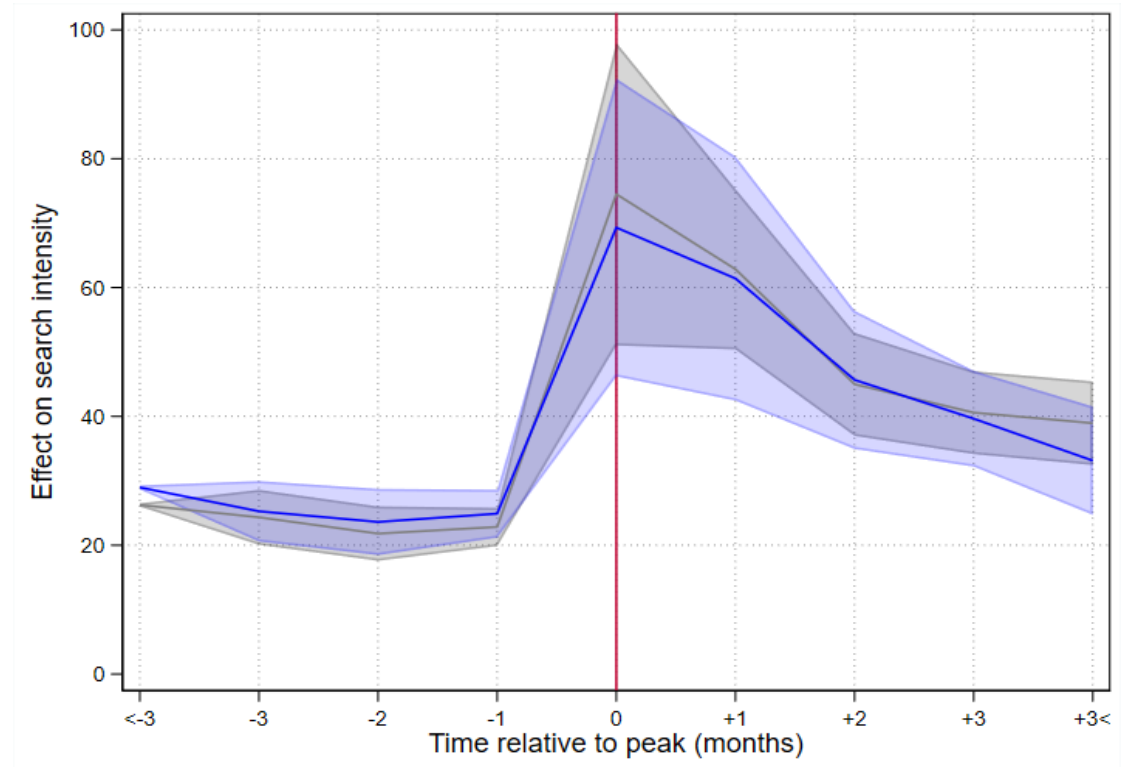


Result 3 – ... did not ease unemployment fears

Great Recession



Great Lockdown



Conclusions

Main findings

- Document a substantial increase in people's economic anxiety in the months following the coronavirus outbreak
- Coinciding slowdown in labour markets and (durable) consumption
 - ▶ complementing findings for the UK and US, both in scope and data used
- Fear was more outspoken in those EU countries hit hardest
 - ▶ risk of a widening gap between EU member states and hysteresis
- Unemployment-related fears, which have recently jumped far beyond those observed during the Great Recession
- Fears were not eased by renewed attention for short-time work schemes, despite evidence for such an effect during the Great Recession

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Supplementary materials

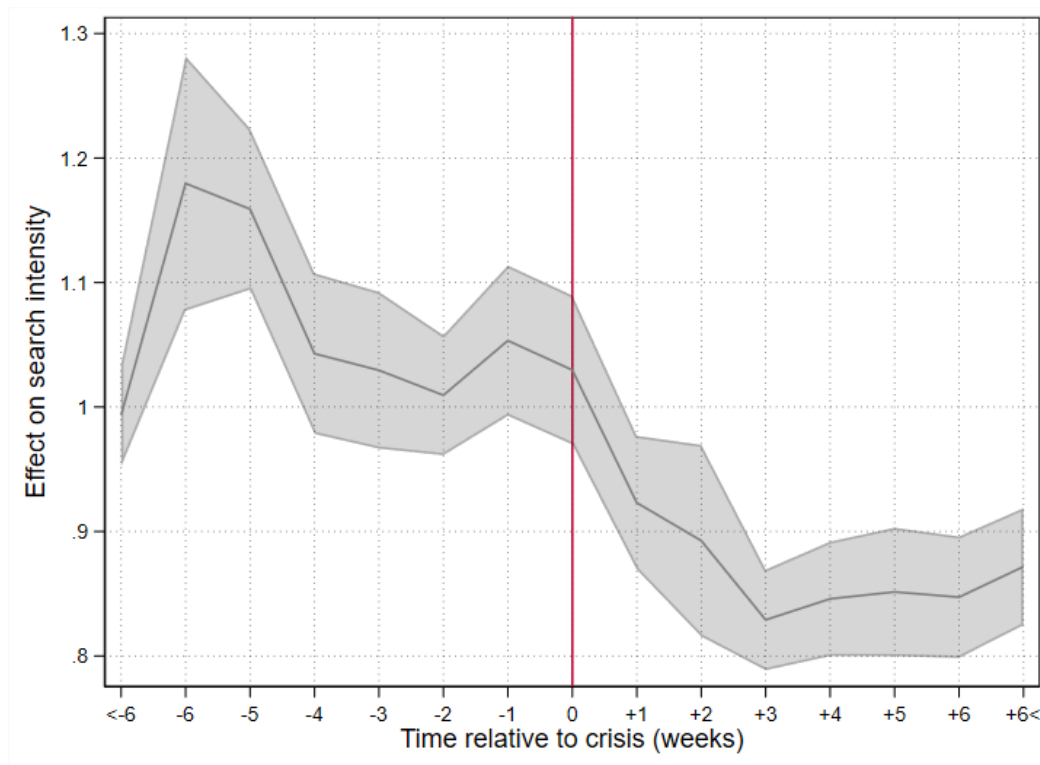
Result 4 – Coinciding slow-down in job search

	Job Board	Manpower	Randstad	Adecco	Indeed	LinkedIn	Curriculum	Resume
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.996*** (0.0117)	0.934*** (0.0385)	0.986*** (0.0357)	0.979*** (0.0364)	1.003*** (0.0203)	1.005*** (0.0104)	0.996*** (0.0388)	1.013*** (0.0212)
Cut-off dummy I (# cases > 3)	-0.364*** (0.0202)	-0.228*** (0.0600)	-0.311*** (0.0558)	-0.366*** (0.0473)	-0.314*** (0.0322)	-0.179*** (0.0168)	-0.156 (0.106)	-0.123*** (0.0339)
Day Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	70.354	10.924	17.981	39.167	35.955	22.518	11.405	4.279
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
Goodness-of-fit	0.395	0.020	0.030	0.049	0.104	0.235	0.010	0.016
N° of observations	2352	2646	2156	2548	2646	2646	2646	2646
N° of countries	24	27	22	26	27	27	27	27

Notes: The dependent variable is the seven-day moving average search intensity for country-specific job boards, internationally active agencies and general queries, normalized by the mean search intensity before the COVID-19 outbreak. Cluster-robust standard errors are noted in parentheses: * p<0.10, ** p<0.05, *** p<0.01.

Result 4 – Coinciding slow-down in consumption

Second-hand platforms



Second-hand car platforms

