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OF FINANCE

Economic Effects of the COVID-19 Pandemic

Evidence from panel data in EU countries

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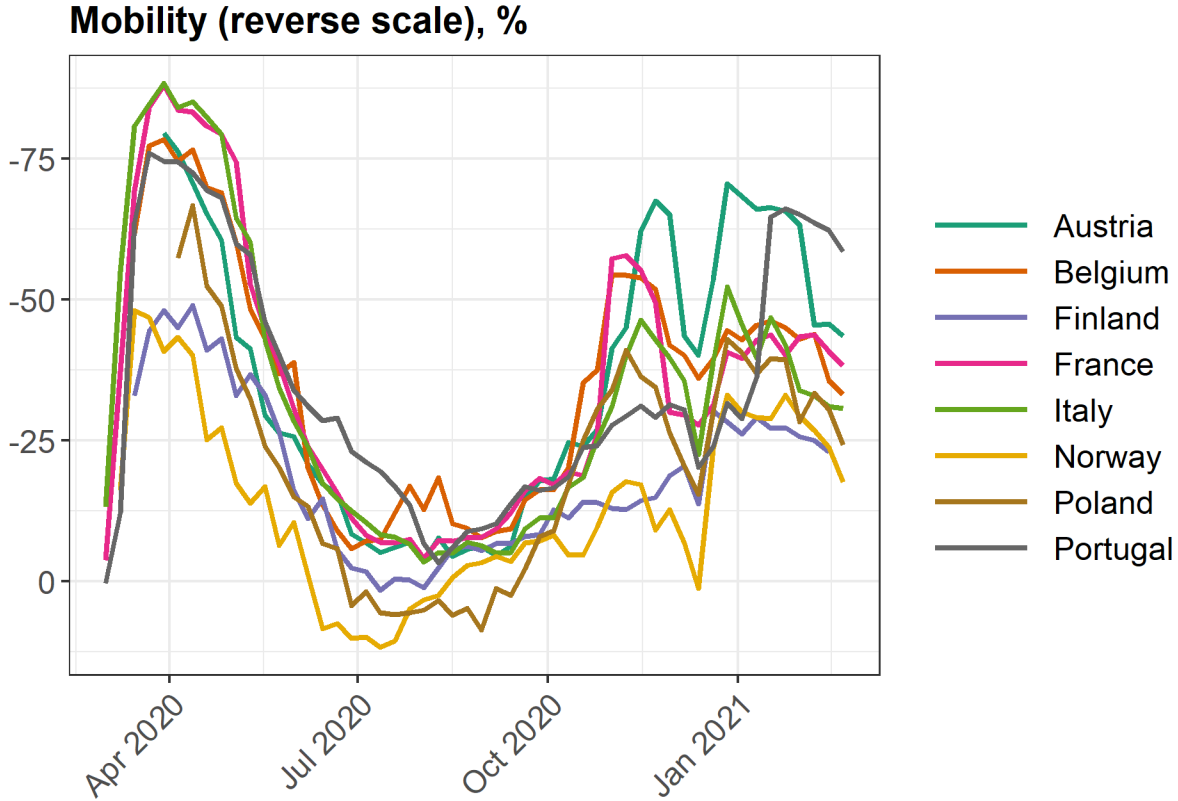
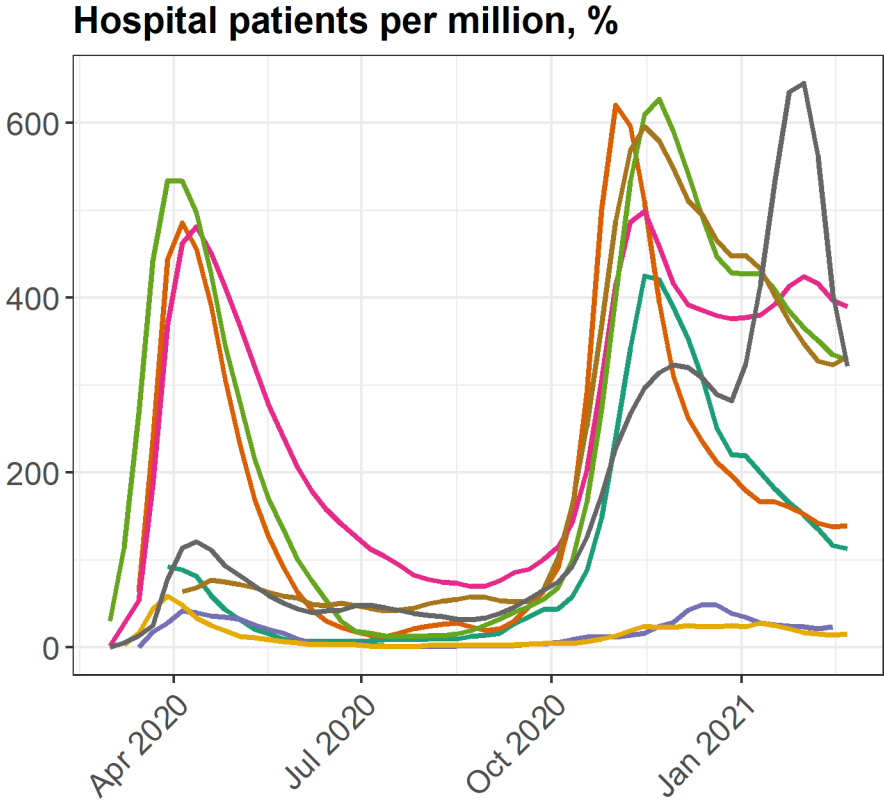
March 9, 2021

14th meeting of the Network of Public Finance Economists in public administration by DG ECFIN

Motivation

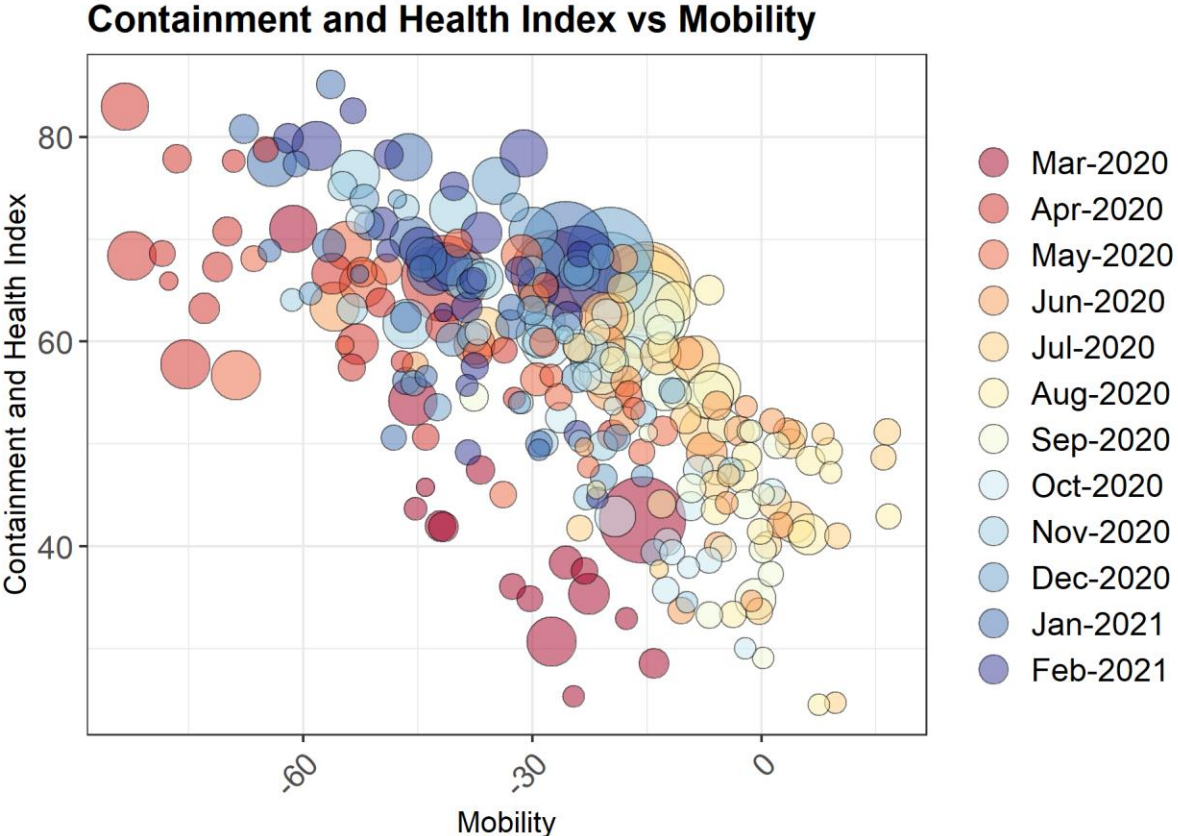
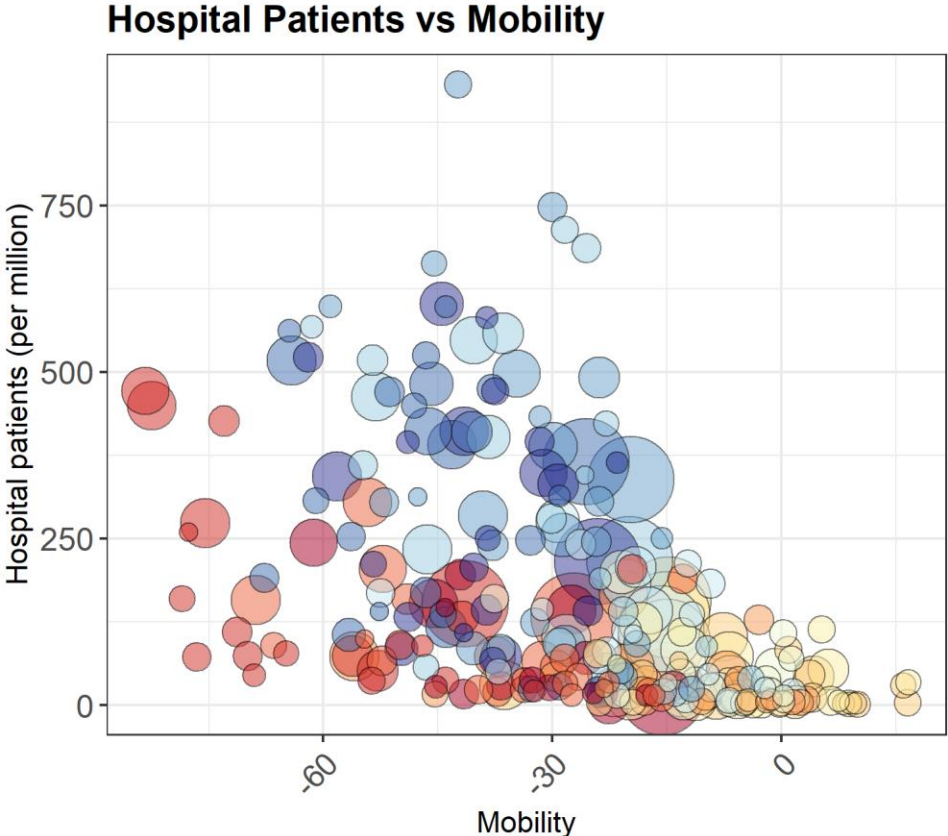
- Economic effects in epidemiological scenarios
 - Short-term projections of Finnish GDP conditional on the pandemic spanning from December 2020 to June 2021 ([Varanka et al., 2021](#))
- Estimates on the effect on service sector and the whole economy
 - Severity of the disease
 - Mobility/(self-)isolation
 - Containment measures
 - Economic support measures
- Key finding:
 - Rate of hospitalization seems to explain economic effects

Mobility has decreased as the pandemic has worsened



- Austria
- Belgium
- Finland
- France
- Italy
- Norway
- Poland
- Portugal

Negative relationship between restrictions and mobility across EU countries



Fixed effects model for 17 EU countries

- The model equation for a country and $i = 1, 2, \dots, N$ period $t = 1, 2, \dots, T$ can be formulated as

$$Y_{it} = \alpha_i + \gamma_t + \beta X_{it} + \varepsilon_{it},$$

- Y_{it} is the dependent variable, α_i is the country-specific fixed effect, γ_t is the time effect, β is the parameter vector, X_{it} is the vector of independent variables and ε_{it} is the random error term.

Data includes measures of economic activity, the epidemiological situation and government response

- Dependent variables:
 - Baseline specification: Economic Sentiment Indicator (ESI)
 - Alternative specification: Services Confidence Indicator (SCI)
- Independent variables:
 - Reported patients receiving hospital care
 - Google Community Mobility Index
 - Economic Support Index (SI)
 - Containment and Health Index (CHI)
- Monthly averages of the daily observations.
- Estimation period 2020:M3-2020:M10.

Need for hospital care significant in explaining economic sentiment

	Dependent variable ESI			
	(1)	(2)	(3)	(4)
Hospital care (per million)	-0.0201*** (0.005)	-0.0192** (0.006)		-0.0159* (0.007)
Mobility		0.01751 (0.062)	0.07589 (0.057)	
CHI	-0.1275** (0.076)	-0.1189 (0.091)	-0.0760 (0.094)	-0.0786 (0.098)
SI	0.03915 (0.038)	0.03947 (0.038)	0.043425 (0.041)	0.0397 (0.038)
Mobility x CHI				0.00090 (0.000)
Fixed effects	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes
Observations	135	135	135	135
Countries	17	17	17	17
Time periods	7-8	7-8	7-8	7-8
R ²	0.9	0.9	0.89	0.9
Adjusted R ²	0.87	0.87	0.86	0.87

7 Standard errors in parentheses. * $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Service sector confidence seems more sensitive to the pandemic than general economic confidence

	Dependent variable SCI			
	(5)	(6)	(7)	(8)
Hospital care (per million)	-0.0263** (0.013)	-0.0219 (0.015)		-0.0154 (0.015)
Mobility		0.09221 (0.072)	0.15956* (0.063)	
CHI	-0.1468 (0.108)	-0.0985 (0.095)	-0.0446 (0.106)	-0.0159 (0.110)
SI	0.04505 (0.061)	0.04685 (0.062)	0.05024 (0.063)	0.04647 (0.061)
Mobility x CHI				0.00233* (0.000)
Fixed effects	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes
Observations	127	127	127	127
Countries	16	16	16	16
Time periods	7-8	7-8	7-8	7-8
R ²	0.9	0.9	0.9	0.9
Adjusted R ²	0.87	0.87	0.87	0.87

8 Standard errors in parentheses. * $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Limited effects of economic support measures

- Need for hospital care key variable in explaining economic sentiment
 - On average 100 persons per million per month reduces ESI by 2 points
 - [Goolsbee and Syverson \(2021\)](#)
- Economic support measures have been important in mitigating the adverse effects of the crisis
 - Reduction in unemployment and bankruptcies, spill-overs to other sectors
- Possible reasons for low/insignificant parameter estimates for economic support and containment measures
 - Economic Support Index (SI) a limited measure of support measures
 - Insufficient variation
 - Multicollinearity

Conclusion

- Estimates on the economic effects of the pandemic needed to evaluate economic effects in epidemiological scenarios
- Need for hospital care significant in explaining economic activity
- Model has a limited ability to assess the effectiveness of economic support measures
- Uncertainty about extending the results out-of-sample
 - Vaccinations
 - Restriction fatigue
 - Spill-over effects beyond travel, transportation and services



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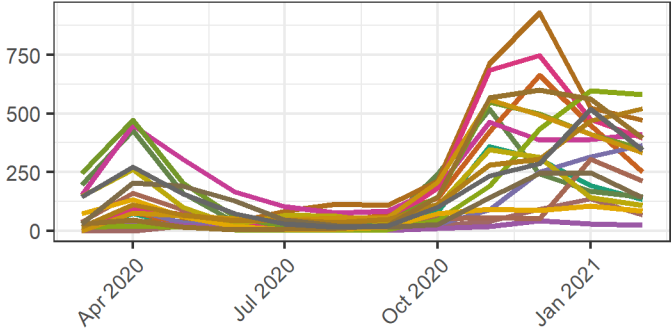
Thank you!

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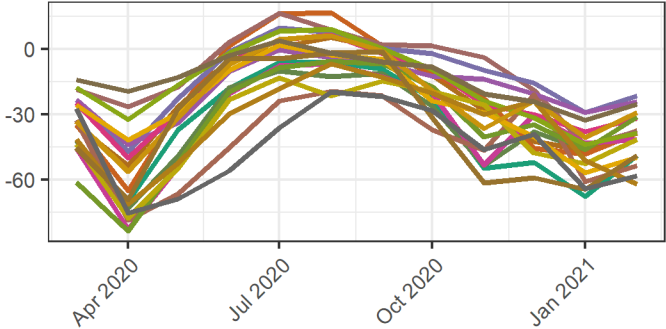
Appendix

Data used in the estimation

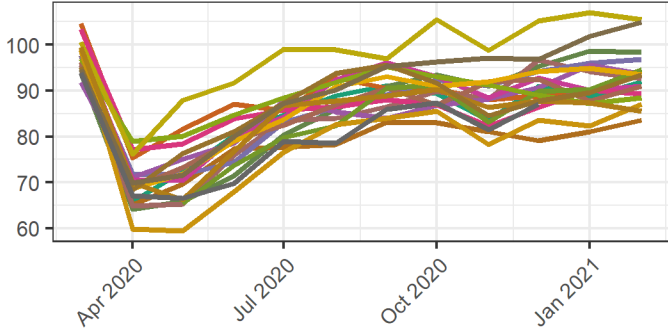
Hospital patients (per million)



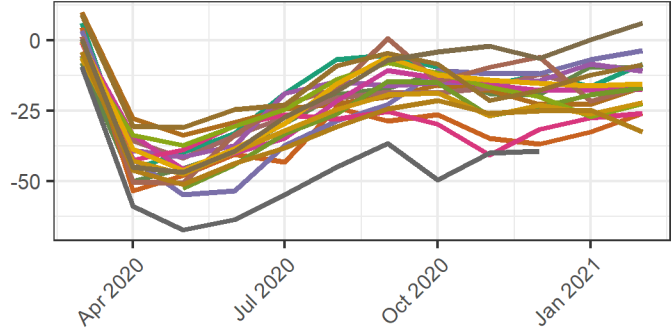
Mobility, %



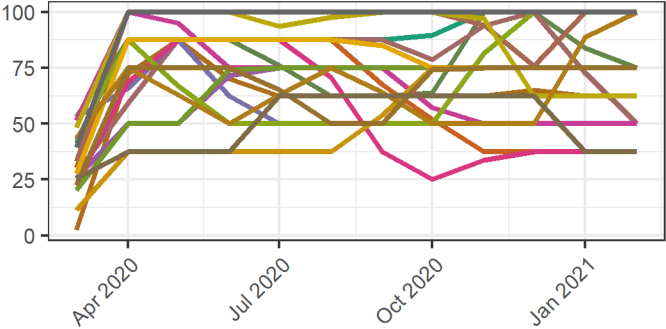
Economic Sentiment Indicator



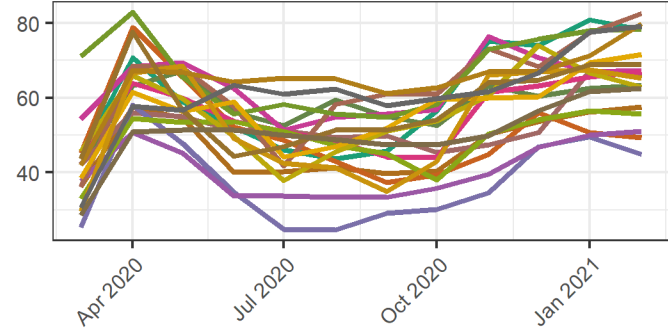
Service Confidence Indicator



Economic Support Index



Containment and Health Index



Fit of the model for preferred model specification (1)

