The uneven impact of Covid-19 on enterprises across Italian small areas: a microsimulation approach.

Giulio Consiglio*, Erica Delugas[+], and Emanuela Sirtori*

* CSIL, Milan, Italy
[+] CSIL, Milan, Italy and CRENoS

Extended Abstract

Significant territorial differences have characterised the spread of the COVID-19 health emergency and its subsequent economic and social repercussions. The pandemic has distinctly demonstrated regional characteristics since the economic impacts have varied greatly at the local level and understanding these uneven effects necessitates a regional perspective (Bailey et al., 2020). Factors such as urbanisation levels, population density, economic and commercial ties, both formal and informal networks, and demographic variations have all played a role in shaping the crisis's impact across different regions. On the one hand, more developed, urbanised, and interconnected areas were among the first to feel the brunt of the pandemic, primarily due to their dense economic activities and high volume of passenger traffic (ESPON, 2020; Rodriguez-Pose and Burlina, 2021). Conversely, the pandemic has also intensified existing disparities in essential services like healthcare and education. This has disproportionately affected less developed and more peripheral areas, revealing their vulnerabilities and limited resources (OECD, 2020). These regions' structural conditions, marked by lower development levels, have undermined their capacity to respond and recover from the pandemic's shocks, potentially leading to an exacerbation of existing territorial inequalities in the coming years.

This debate has been particularly relevant in Italy, one of the ten worst-hit countries in the World,[1] where more developed areas experienced early and intense impacts from the pandemic, driven by dense economic and passenger flows. In contrast, peripheral territories, although less affected by COVID-19 during the initial contagion wave, saw a marked increase in structural inequalities, particularly in the provision of essential services. Literature has highlighted some aspects of these inequalities, underlining the importance of local and sectoral components of the impacts of the crisis in Italy. Ascani et al. (2021) provide evidence of this close relationship between COVID-19 disease patterns and local economies' characteristics, showing the correlation between the local share of countrywide COVID-19 confirmed cases and a measure of provincial engagement in geographically concentrated sectors. Brancati and Brancati (2020) shows disproportionate effects for internationalised companies and provide some preliminary evidence on supply chain contagion. They also document stronger shocks for truly innovative companies and effects on long-run growth operating through the disruption of preexisting R&D plans. Casarico and Lattanzio (2020) focus on how different categories of workers were affected by the pandemic in the short-term and carry out a first evaluation of the policy responses implemented. Cerqua and Letta (2020) detect geographic diversity of COVID-19 employment impacts investigating this heterogeneity at local labour markets level.

This scenario has presented unparalleled challenges for policymakers, particularly in supporting enterprises in vulnerable territories. Initially, the policy response to the pandemic was a top-down, generalised approach, where non-essential productive activities were halted. However, recognising the uneven spread of the virus, Italy shifted to a place-based strategy during the second wave, implementing varying levels of restrictions and workplace closures tailored to the pandemic's evolution across different regions. Concurrently, several emergency measures and fiscal packages were introduced, including a COVID-19 short-time work compensation scheme, a firing freeze, and financial support measures at both national and European levels.[2]

While existing research, such as Cerqua and Letta (2020), has examined the local impacts of the first wave of COVID-19 on employment and business demography, a significant knowledge gap persists regarding a comprehensive analysis of the specific impacts on business performance and demography at the small area level. The scarcity of detailed geographic data on business outputs has hindered empirical analysis,

---

[1] https://www.worldometers.info/coronavirus/

[2] See for detail IMF (2021), the database of fiscal policies of IMF available at: https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19

especially in dissecting labour market segmentation and socio-economic disparities locally. This gap in granular data likely led to suboptimal policy responses during the crisis, aggravating structural territorial inequalities. The pandemic has indeed not only underscored short-term vulnerabilities but also brought to light deeper structural issues in economies. Hence, there is a pressing need for public policies to adopt a long-term outlook, focusing on both immediate and future trends, such as the accelerated digitalisation and shifts in labour patterns (OECD, 2020), and the impacts on human capital and productivity (Fuentes and Moder, 2021). As Openshaw (1995) highlighted, the capability of governments to anticipate and address crises at the local level is crucial.

In this context, the use of microsimulation models, which have been extensively applied to assess the distributional effects of COVID-19 and fiscal policies on personal and household income (e.g., Cantó et al. 2022; Christl et al. 2022; Figari and Fiorio 2020; Figari et al. 2020), can be pivotal in filling this gap. Recurring to such approaches is not new in policy analysis in terms of alternatives and effects (e.g., Bourguignon and Spadaro 2006; Vandyck and Van Regemorter, 2014; Figari et al. 2015; Berry 2019; Brum and De Rosa 2021). Spatial microsimulation, in particular, offers a significant advancement over traditional small area estimation approaches. Its ability to generate synthetic microdata for each small area provides a detailed and varied analysis, crucial for effective and nuanced policy planning and for addressing spatial inequalities more thoroughly (Tanton 2014). By employing spatial microsimulation, policymakers can obtain a deeper understanding of the localised impacts of the pandemic. This, in turn, enables the formulation of more precise and impactful policies that cater to the immediate needs and long-term structural challenges of different territories.

In light of these considerations, we introduce a spatial static microsimulation model that leverages a comprehensive dataset, integrating business microdata from Bureau Van Dijk with statistics from the Italian National Institute of Statistics (Istat) at both provincial and municipal levels. This model is designed to examine the diverse effects of pandemic-related policy measures on the performance of Italian enterprises and the competitiveness of territories at the provincial level. The microsimulation approach involves a reweighting microsimulation method, a well-established technique in spatial modelling, previously applied in contexts such as individual and household analysis and labour market studies (Ballas et al. 2007; Anderson et al. 2013; Ballas et al. 2013; Panori et al. 2019). Additionally, the study will exploit local characteristics to assess the vulnerability of territories with similar features. This will facilitate comprehensive 'what-if' scenario analyses at the small area level, aimed at understanding how different policy interventions might have led to varied outcomes in enterprise performance and territorial competitiveness, particularly in areas with different levels of vulnerability.

This present study is innovative on multiple fronts. Methodologically, it introduces a novel microsimulation model specifically designed for Italian businesses, facilitating a detailed examination of policy impacts on smaller geographical areas. This approach significantly enhances our understanding of the local drivers influencing the effects of pandemic countermeasures. The study sheds light on the role of structural inequalities in shaping the efficacy of these policies. Doing so provides a deeper insight into current policy outcomes and paves the way for developing more effective policy strategies in response to future crises.

References

Anderson, B., De Agostini, P., & Lawson, T. (2013). Keegan, M & Dekkers, G.,(2013) Current Developments in Microsimulation and Policy Design, Ashgate.

Ascani, A., Faggian, A., & Montresor, S. (2021). The geography of COVID-19 and the structure of local economies: The case of Italy. *Journal of Regional Science*, *61*(2), 407-441.

Bailey, D., Clark, J., Colombelli, A., Corradini, C., De Propris, L., Derudder, B., ... & Usai, S. (2020). Regions in a time of pandemic. *Regional Studies*, *54*(9), 1163-1174.

Ballas, D., Kingston, R., Stillwell, J., & Jin, J. (2007). Building a spatial microsimulation-based planning support system for local policy making. *Environment and Planning A*, *39*(10), 2482-2499.

Ballas, D., Clarke, G., Hynes, S., Lennon, J., Morrissey, K., & O'Donoghue, C. (2013). A review of microsimulation for policy analysis. *Spatial microsimulation for rural policy analysis*, 35-54.

Berry, A. (2019). The distributional effects of a carbon tax and its impact on fuel poverty: A microsimulation study in the French context. *Energy Policy*, *124*, 81-94.

Bourguignon, F., & Spadaro, A. (2006). Microsimulation as a tool for evaluating redistribution policies. *The Journal of Economic Inequality*, *4*, 77-106.

Brancati, E., & Brancati, R. (2020). Heterogeneous shocks in the COVID-19 pandemic: Panel evidence from Italian firms. *Available at SSRN 3597650*.

Brum, M., & De Rosa, M. (2021). Too little but not too late: nowcasting poverty and cash transfers' incidence during COVID-19's crisis. *World Development*, *140*, 105227.

Cantó, O., Figari, F., Fiorio, C. V., Kuypers, S., Marchal, S., Romaguera-de-la-Cruz, M., ... & Verbist, G. (2022). Welfare resilience at the onset of the COVID-19 pandemic in a selection of European countries: Impact on public finance and household incomes. *Review of Income and Wealth*, *68*(2), 293-322.

Casarico, A., & Lattanzio, S. (2020). The heterogeneous effects of COVID-19 on labor market flows: Evidence from administrative data. *Covid Economics*, *52*, 152-174.

Cerqua, A., & Letta, M. (2020). Local economies amidst the COVID-19 crisis in Italy: A tale of diverging trajectories.

Christl, M., De Poli, S., Figari, F., Hufkens, T., Leventi, C., Papini, A., & Tumino, A. (2022). Assessing the cushioning role of tax-benefit systems on households' income in the euro area during the COVID-19 pandemic: a microsimulation analysis. *Quarterly Report on the Euro Area (QREA)*, *20*(4), 7-16.

EPSON (2020). Territorial impacts of COVID19 and policy answers in European regions and cities

Figari, F., & Fiorio, C. (2020). Welfare resilience in the immediate aftermath of the COVID-19 outbreak in Italy. *Covid Economics*, *2020*(8), 106-133.

Figari, F., Fiorio, C., Gandullia, L., & Montorsi, C. (2020). La resilienza del sistema italiano di protezione sociale all'inizio della crisi COVID-19: evidenze territoriali (The resilience of the Italian social protection system at the beginning of COVID-19 outbreak: territorial evidence). *Politica economica*, *36*(1), 3-33.

Figari, F., Paulus, A., & Sutherland, H. (2015). Microsimulation and policy analysis. In *Handbook of income distribution* (Vol. 2, pp. 2141-2221). Elsevier.

IMF (2021). Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic. IMF Fiscal Affairs Department. Available at: https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19

Martín Fuentes, N., & Moder, I. (2021). The scarring effects of past crises on the global economy. *Economic Bulletin Boxes*, *8*.

OECD (2020). The territorial impact of Covid-19: Managing the crisis across levels of government (updated November 2020). Available at: https://read.oecd-ilibrary.org/view/?ref=128_128287-5agkkojaaa&title=The-territorial-impact-of-covid-19-managing-the-crisis-across-levels-of-government

Openshaw, S. (1995). Developing automated and smart spatial pattern exploration tools for geographical information systems applications. *Journal of the Royal Statistical Society: Series D (The Statistician)*, *44*(1), 3-16.

Panori, A., Ballas, D., & Psycharis, Y. (2017). SimAthens: A spatial microsimulation approach to the estimation and analysis of small area income distributions and poverty rates in the city of Athens, Greece. *Computers, Environment and Urban Systems*, *63*, 15-25.

Rodríguez-Pose, A., & Burlina, C. (2021). Institutions and the uneven geography of the first wave of the COVID-19 pandemic. *Journal of Regional Science*, *61*(4), 728-752.

Tanton, R. (2014). A review of spatial microsimulation methods. *International Journal of Microsimulation*, *7*(1), 4-25.

Vandyck, T., & Van Regemorter, D. (2014). Distributional and regional economic impact of energy taxes in Belgium. *Energy Policy*, *72*, 190-203.