FIRMS, CITIES AND REGIONS IN THE ECONOMIC POLICY RESPONSE TO COVID-19

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Abstract

The economic impacts of the COVID-19 crisis present novel dimensions with respect to the consequences materialized after the Great Recession. They are also equally or even more heterogeneous across firms and regions. Pre-existing weaknesses have influenced the short-term trajectories of recovery of firms and regions and will be key for their response to the challenges of the new global equilibria and of the digitalization of the economy. A significant discontinuity in the pandemic economic policy response has been noted vis-à-vis the austerity measures that characterized the policy paradigm in the 2000s. An evidence-based approach is needed to couple the unprecedent resources allocated with tangible, inclusive and timely impacts.

Introduction

This chapter explores the heterogeneous economic impacts of COVID-19 across firms, regions and countries in order to assess how (and to what extent) the pandemic has marked a discontinuity with reference to pre-existing conditions and established patterns of response to external shocks. By leveraging findings in the recent literature, the chapter will first discuss the specificities of the economic shock triggered by COVID-19 to identify similarities and differences in nature, transmission mechanisms and persistence of the shock in comparison with the Great Recession of 2008-2009. Second, the chapter will discuss the unevenness in the distribution of the economic impacts to compare the patterns of inequality materialized after the Great Recession with those emerging during and after the pandemic. Third, how the crisis has opened new (but highly selective) opportunities for innovation will be discussed. Finally, reflection on these key points will be brought together to discuss public policy responses. The discussion will shed critical light on the elements of discontinuity in economic policies vis-à-vis the austerity measures that characterized the policy paradigm in the 2000s. This will enable critical discussion of how and to what extent new policies and tools put in place in response to the pandemic have the potential to generate appropriate impacts in response to new (and old) challenges. Short-term policy impacts that have emerged already will be discussed in the backdrop of the new challenges discussed in the prior sections, highlighting the factors conditioning success and failure. Possible lessons to be learned from the evaluation of existing policies, that can offer new insights on how evidence can improve current responses, will be also highlighted.

1. The economic shock: is it different this time?

In the last few decades, the aggregate economic growth of most advanced economies has slowed down relative to emerging economies – most notably China – and advanced economies' own previous performance in the second half of the last century. In the meantime, subnational trends reveal that a few regions, cities, and

companies have flourished, increasing their productivity and wealth, profits and market shares, concentrating physical and human capital, along with technologies (Autor et al., 2020; Crescenzi et al., 2022). Regional "hubs" have emerged worldwide, attracting human capital, investment, financial flows and firms. Since the 1980s, an increasing process of concentration of productive and innovation activities across firms and regions alike contributed to the rise of disparities across firms, cities, regions, workers and population groups in advanced and emerging economies. A few regions and cities have taken the lead in the economic and technological race, while others have been falling behind or unable to keep the pace both in terms of innovative capacity and economic performance, but also of demographics and human capital accumulation (Iammarino et al., 2019; Martin, 2021).

The 2008 financial crisis, along with the subsequent crisis of public debt, has been the first shock unfolding in such a context, leading to a marked one-year drop of GDP in the EU (-4.2%) and the USA (-2.5%), followed by a sluggish recovery. Since then, global value chains (GVCs) related trade has stagnated, although still representing half of world trade (Lema et al., 2021). Following the financial crisis, companies reacted by reorienting their sourcing strategies towards more risk diversification and breaking the value chains into shorter and less complex ones (OECD, 2013). The propagation of the financial shock in 2008 through GVCs was fast, and the collapse of trade was larger than that of GDP and almost simultaneous across several countries, especially those more integrated in GVCs (Marvasi, 2022). On that occasion, pessimists projected a slowdown in productivity, suggesting that economic growth at the rate experienced in the past might be over (Cowen, 2010; Gordon, 2012) and envisaging the possibility of a secular stagnation (Summers, 2014). Central assumptions are that technological progress was too slow to guarantee sustained growth and/or that some of the radical transformations characterizing previous industrial revolutions are hardly repeatable. Even in the presence of sustained innovation, returns would be lower than in the past. However, it remained unclear from these debates why humanity should be unable to create new "unexpected" growth paths and why it is safe to assume that the development of science and technology follows a linear process. The rate of technological progress is itself moving at an unprecedented speed, faster than what was seen historically, raising doubts on such a pessimistic take on productivity prospects (Rodrik, 2016). On the other hand, it is commonly acknowledged that periods of crisis are moments when selection operates strongly, and the relocation of resources and activities may bring about an overall productivity increase (Schumpeter, 1939). However, the last financial recession has already been characterized by a severe contraction of activities with a less productivity-enhancing reallocation compared to previous (smaller) crises (Foster et al., 2016).

A series of contributions at the onset of the 2008 financial crisis (e.g., Amore, 2015; Archibugi and Filippetti, 2013; Archibugi et al., 2013; Cefis and Marsili, 2019) provided evidence on the crisis-innovation nexus using firm-level data. Increased uncertainty, declining revenues and more binding financial constraints had a differentiated effect on the innovation activities of firms. A generalized decline in R&D activities has been matched by an increase in innovation activities by strong innovators and new firms in high tech sectors, hinting that the cumulative nature of innovation activity tends to be more prominent in times of crisis than normal times. However, the increased perception of risk and cognitive uncertainty may have led to more incremental innovations rather than radical innovations (Amoroso et al., 2017), which in turn may translate to lower growth. Financial constrains induced by crises cause many firms to bypass attractive investment opportunities with the strongest effect being on small firms compared to larger ones (Campello et al., 2010).

These data can be of interest in attempting to figure out the short and medium term consequences of the latest economic crisis associated with the COVID 19 pandemic, which has triggered an even steeper drop in GDP (-7.6% in EU and -4.3% in USA for 2020, according to the IMF) that adds to the pandemic's massive death toll.

Yet, despite the available evidence on the economic effects of crises, the long-lasting effects of the COVID-19 pandemic are not easily predictable. A peculiarity of the impacts of the coronavirus disease is how it has

impacted the way societies and economies work, whose transformation and persistence in the long term are yet to unfold completely.

Firstly, there is no clear theoretical guidance on how the pandemic and the transformations it brought about or enhanced (e.g., the digitalization of the economy) will influence the rate and direction of research and innovation activities, as well as the future of economic activities. Predictions on the future of technology are (at the very least) imprudent (Mokyr, 2015) because systemic features and complex interactions may lead to an underestimation of technological development in some fields, while overstating it in others (Archibugi, 2017). Mechanisms outside the economic sphere, leaving no guarantee of an enhanced reallocation of resources, can play a crucial role.

Secondly, the crisis of 2008 and that of COVID-19 are inherently different. By contrast to what happened in 2008, the COVID-19 crisis did not originate from the economy and has produced effects on societies that go well beyond standard economic channels. Beside the high death toll, the measures put in place by governments to limit the diffusion of the virus – from mandatory mask-wearing to quarantine and lockdowns – impacted economies unevenly despite being a global crisis, hitting specific categories of firms and workers, sectors, cities and regions more than others. At the outburst of the crisis, the impact was mostly concentrated in regions characterised by higher concentrations of economic activities and more exposure to national and international trade, due the abrupt stop of the circulation of people. For instance, Ascani et al. (2021) find that this was the case in Italy, where the geographical diffusion of the pandemic was associated with the spatial concentration of economic activities across Italian provinces and the extent of trading networks across space. In particular, the observed effect was driven mostly by agglomeration of manufacturing activities, due to the physical interactions required by tasks that cannot be undertaken remotely, as for instance in the case of services. These patterns can be generalized to other countries, in particular concerning the relevance of trade networks (Gong et al., 2020; Bontempi et al., 2021) and the mitigating role of remote workable tasks and occupations (Espitia et al., 2022). Nonetheless, the OECD (2021) report demonstrated that while more densely populated areas were more severely hit at the outbreak of the pandemic, the virus diffused towards areas with a lower population density in the second half of 2020. As such, there has not been a "levelling" effect, as the initial diffusion of the virus in more densely populated areas with higher concentration of economic activity was followed by increasing infection and mortality rates in rural and peripheral areas, as well as in poor regions and cities characterized by high population density and low health and socio-economic conditions, contradicting earlier studies exclusively focusing on initial epidemic diffusion patterns.

Another important characteristic of the COVID-19 crisis is its double linkage with the international connectivity map. On the one hand, supply chain linkages played a major role for the transmission of the COVID-19 shock during the first wave of the pandemic. Overall, European Member States experienced a decline of more than 20% in trade following the virus outbreak with the number of registered COVID-19 cases being correlated with a decline in exports of intermediated goods to partners, especially those specialized in production phases closer to the final demand (Kejžar et al., 2021). On the other hand, the shock caused by the COVID-19 pandemic has also had repercussions on GVCs where production is broken into activities and tasks carried out in different countries; during the pandemic the transmission seems to have affected some specific value chains more selectively. Finally, the COVID-19 pandemic has caused a dramatic shortage in medical supplies, such as personal protective equipment, due to a massive surge in demand, containment measures, and the imposition of export controls to meet domestic demand. GVCs for medical supplies are characterized by interdependence of trade and production where advanced countries specialize in the relatively high-tech medical devices sector. Low-cost production hubs, such as China and Malaysia, are leading producers of less technologically sophisticated personal protective equipment (Gereffi, 2020), such as masks and gloves, that faced significant shortages during the first wave of the pandemic. Other production networks were affected as well, especially those relying on China, located in the center of the pandemic and which put in place particularly strict containment policies. The impact of the GVC shock propagated from China to downstream countries

(closer to the market) - such as Germany, Japan, South Korea or the U.S. – and through sectors where China has a strong position in the global production network: electronic and optical equipment, textiles, machinery, manufacturing and wholesale trade (Qin et al., 2020).

2. Old and new patterns of disadvantage

At the firm level, micro-level dynamics can have wide implications on how a crisis will affect long-term societal development, particularly through their effects on science, technology and innovation. These activities represent the main sources of growth (Aghion and Howitt, 1992) and are inherently risky and characterized by uncertainty and long-term returns (Archibugi and Filippetti, 2013; Hall et al., 2016). It has been shown that the negative impact of the COVID-19 pandemic on EU firms' economic performance has been less severe for innovative than non-innovative firms and the difference in the performance of these two groups was significantly higher in 2020 than in 2009 (Santos et al., 2021). The crisis also impacted firms' outlook with huge uncertainty jumps as a reaction to the pandemic (Altig et al. 2020). Innovators, in particular those who are young and those who rely on internal sources of knowledge, have been more likely to adapt to COVID-19 than non-innovators, with better management practices that also led to a greater ability to adapt to the crisis (Krammer, 2022). However, the COVID-19 shock has especially jeopardized R&D plans of firms that had recently started new research programs as well as newly innovative companies, which can be interpreted as evidence that pre-existing sunk costs increase the persistence of R&D choices after uncertainty shocks (Brancati, 2021). Interestingly, as a response to the COVID-19 crisis European firms have increased the introduction of marketing innovation compared to product and process innovation (Santos et al., 2021). The authors also show that European firms had a much higher probability to introduce organizational innovations as a response to the COVID-19 shock compared to the 2008 financial crisis. This result is consistent with the fact that most of the respondents feared mobility restrictions, difficulties in finding/reaching costumers and bottlenecks in logistic more than access to finance (Santos et al., 2021).

Size also mattered. The impact of COVID-19 has been particularly severe on small business. According to Bartik et al. (2021) , small and micro businesses had little cash to hand at the beginning of the pandemic. The number of active business owners in U.S. plunged by 3.3 million (22%) in the first wave (Fairlie, 2020), while small offline firms experienced sales drops up to 30 percentage points more compared to the largest online firms (Bloom et al., 2021). Beside sales, the total factor productivity of US companies also fell (about 5%) during the 2020-2021 period, due to the containment measures that reduced the availability of factors of production and increased intermediate costs. The negative effect has been partially offset by a positive between-firm effect as low productivity sectors were disproportionately affected (Bloom et al., 2020a). In general, the COVID-19 crisis has amplified pre-crisis weaknesses because weaker firms have been hit harder and generally are more likely to experience difficulties in the future, thus being more likely also to lay off workers and to cancel or postpone investment projects (Buchheim et al 2020).

In relation to the sectoral dimension, the impact of COVID-19 on firms has been particularly severe on those sectors requiring extensive in-person activity, while firms where most of the tasks could be undertaken from home and where sales involve less face-to-face contact with customers are most likely to have seen productivity increases. In other words, sales losses were largest in businesses more affected by mandatory lockdowns such as arts, tourism, hotels and restaurants. At the same time e-commerce surged as well as the demand for durable goods such as home electronic appliances (Abay et al., 2020; Tauber and van Zandweghe, 2021). For some goods such as personal protective equipment (e.g., masks or gloves) a spike in demand combined with GVCs bottlenecks and restrictive trade policy measures resulted in serious shortages (Park et al., 2020). During the second quarter of 2020, business sales in California dropped by an average of 17%, which was however made up of two very distinct patterns: businesses like accommodations registered critical losses in sales (i.e. – 91%)

while online sales grew by up to 180% (Fairlie and Fossen, 2022). The strong shift to online vendors and platforms has primarily affected small businesses that didn't have the resources (or technologies) to compete in a suddenly changed market environment. Similar trends have been seen in Europe and in the rest of the world.

The heterogeneous effect of containment measures has been also reflected by a differentiated effect of the crisis on the labor force. The demand of workers for in-person activities has declined together with the parental supply of labour, which has been reduced due to lack of access to reliable childcare and in-person schooling (Albanesi and Kim, 2021). This has led to a substantial drop in employment and labour force participation for women. In contrast to the 2008 financial crisis, during which time men where slightly more affected than women, during the first phase of the COVID-19 pandemic, the decline in employment for women was substantially larger than for men during the recession, especially for women with children (Albanesi and Kim, 2021). Overall, increased job insecurity and reduced disposable income for many vulnerable workers have been partially compensated by welfare policy measures.

As a result of all these dynamics, regions and cities that depend more on tourism, manufacturing, and activities less amenable to remote working, have been the most exposed to lockdowns, mobility and travel restrictions, suffering large employment and output losses. By contrast, a more diversified industrial base ensured positive figures in ICT and digitally intensive sectors to mitigate the aggregate impact on GDP (Borunsky et al., 2020; OECD, 2021). The literature has shown that the capacity of regions to recover from the shock effectively depends on their resilience, defined as the capacity to "bounce back" following an external shock such as a crisis. The most recent and shared definition of resilience goes beyond a simple return to the pre-existing equilibrium once the shock has been absorbed, as does the cane in La Fontaine's tale of the cane and the oak tree. Resilience rather encompasses the capacity of a socioeconomic system to resist a shock, but also to transform itself in an adaptive way, shaping its own structure in the long term such that the new development path will likely differ from that prior to the shock (Martin, 2012).

The empirical and theoretical literature describes the resilience potential of a region, at whatever spatial scale, as dependent on the "cumulative capability" developed overtime, which makes regions capable of recovery and adaptation following a major shock (Martin, 2012; Filippetti et al., 2020). Such a capability is usually linked to innovative performance and the strength of the innovation ecosystem, as for instance found by Filippetti et al. (2020) in their analysis of the response of European regions to the last economic and financial crisis. In turn, path dependency affects the innovation potential of regions, due to the cumulated knowledge capacity and industrial relatedness (Boschma et al., 2015). More generally, the literature on complexity and related variety (Hidalgo et al., 2007) has developed a dynamic concept of resilience, intended as a process of economic renewal affecting long term development prospects and allowing socioeconomic systems to adapt and evolve following a crisis (Martin, 2012; Boschma, 2015). Industrial diversification, knowledge networks and various forms of proximity contribute to define regional resilience. All those factors traditionally associated with economic growth (and resilience) are likely to be key as the constraints and effects of the virus fade away. Human capital, absorptive capacity and endowments of digital and physical infrastructure are all factors that were unevenly distributed before the pandemic hit, and they remain so. This implies that the "new" losers may not differ from the old ones, as the distribution of the above endowments already determined the economic geography and the observed trends before the onset of the pandemic.

3. After the crisis: opportunities and open scenarios

The very specific impact of COVID-19 across different business types and segments of the population raises some doubt regarding a possible "cleansing" effect of the crisis. Where increases in productivity are partly

driven by an intersectoral reallocation of resources (away from or) to specific sectors and activities, the question is whether, with the return to normality, some sort of reallocation back to the most affected sectors by the crisis should be expected or even envisaged. For example, in the grip of lockdowns, airlines were fighting for survival focusing on cutting costs with the result that about 2.3 million fewer people employed in the aviation industry by September 2021 (Georgidias, 2022) The difficulty of (re)hiring skilled workers led to the generalized disruption hitting airlines and airports in the first half of 2022, as passengers try to go back to normality and fly in large numbers again.

On a global perspective, the disruption of GVC trade caused by the COVID-19 crisis has put into question the current GVC paradigm giving birth to the concept of strategic autonomy (Baldwin and Breton, 2021). New geopolitical and geoeconomics considerations may instead reinforce uncertainty about the future inducing firms to revise their internationalization strategies.

Despite the discussions about a possible end of the globalization era, there is still little systematic evidence supporting the idea that world economy has entered an era of de-globalization (Antràs, 2020). Reshoring production (either from own subsidiaries or suppliers) has been a choice of a small minority of multinationals in the aftermath of COVID-19. For example, using a sample of Italian firms from the World Bank Enterprise Suvery, Marvasi (2022) shows that only 10% of firms interviewed in 2020 had reduced or planned to reduce the number of foreign suppliers, while less than 4% declared to have already re-shored their activities (Marvasi, 2022). However, adjustments to GVCs may gradually materialize because business executives are unlikely to shut down offshore plants due to temporary mobility restrictions (which caused increasing transport costs and delays) but they are likely to factor in these considerations when deciding new plant or partners' locations (Antràs, 2020). It seems likely that contingency plans will be put in place to face future crises, and in this respect there is a need to take a broader systemic perspective based on robust and resilient supply chains combining the advantages of global reach and local responsiveness (Gereffi, 2020). According to Gereffi, resilient supply chains in the future may be based on two key points: (1) in designing the international production network firms should avoid overreliance or dependence on just one or two locations by carefully considering the trade-off between security advantages provided by local suppliers and optimized supply chains in distant locations (Shih, 2020), and the fact that overly dispersed production networks may involve costs higher than benefits (Castellani et al., 2017); (2) when dealing with security concerns for essential products in a GVC approach it is crucial to understand whether it is the product itself that is essential or key components of inputs integrated in the final product (Gereffi, 2020).

Another issue magnified by the pandemic refers to the role of digitalization in the future of economies and societies. As a side effect of the spread of the virus alongside containment policies, there has been a marked acceleration in the adoption of digital technologies across sectors and businesses (Priyono et al., 2020; Amankwah-Amoah et al., 2021; Zhang et al., 2022), a process that was already ongoing on a global scale (Acs et al., 2021). The need to put in place alternative ways of working in a context of high uncertainty with recurring social distancing measures and lockdowns forced the spread of the use of digital tools to enable working remotely, or working from home, in the public and private sector alike (Belitski et al., 2022). Up to now, the ongoing digital revolution, characterized recently by developments in artificial intelligence and its horizontal applications across sectors and businesses, has not led either to a reduction of disparities, nor to an overall increase of productivity prospects. Different authors have attempted to explain why this is the case, some arguing that the low hanging fruits of technological advances have already been reaped and the ongoing technological revolution "is not enough" (Gordon, 2016), or that marginal returns from science have decreased (Bloom et al., 2020b). Others have pointed out that the persistence of such a territorial divergence and aggregate performance may be due to failure in the diffusion of technologies and related economic benefits from the "hubs" to peripheral regions and firms (Andrews et al., 2016; Rodrik, 2016). Innovations tend to be developed by the best firms in the most advanced regions, and they tend to stay there as the required absorptive capacity

is not easily matched elsewhere, or because of agglomeration and networks effects. Hence, while digital transformation has produced wide impacts across businesses, societies, and economies (Nambisan et al., 2019), the intrinsic nature of AI technologies, with higher and increasing complexity building on previously cumulated technologies, may not contribute to relax the status quo, even beyond its potential impacts on labor demand and individual inequalities (Acemoglu and Restrepo, 2020). From a different perspective, Rikap (2021) argues that the increasing concentration of innovation and profits may be understood as a consequence of the contemporary structure of what she defines as "knowledge" capitalism, characterized by a few global multinationals concentrating and accumulating intangible assets at an increasing pace. She argues that such a hyper concentration of intangible assets is crucial to explain the concentration of capital and profits.

Against this backdrop, while the combination of digitalization and mobility restrictions have impacted the organisation of work-life balance in unprecedented and unforeseen ways, the accelerated digitalization and the diffusion of work from home brought by the pandemic shock have been asymmetric, benefitting regions, sectors, and individuals in heterogeneous ways. People did move out of densely populated cities either to work remotely or because of business closure in those activities requiring physical proximity. Rramani and Bloom (2021) analyse the variation of rents in high density areas across the United States, finding a decline of about 10% in 2021, while rental prices increased in more spacious suburbs due to people relocating from the centres. The positive correlation between teleworkability and population density is likely driving what they define a "doughnut" effect: relatively high skilled workers working remotely moved out from the centres, causing a fall in real estate prices for properties in the city centres. Similarly, the pandemic not only impacted mobility in the short term because of restrictions put in place to slow down the diffusion of the virus (Huang et al., 2020; Santamaria et al., 2020), but it also changed commuting habits and frequency. Hybrid working arrangement between commuting and work from home are probably going to remain, the former at a lower level compared to the pre-pandemic period (Rramani and Bloom, 2021).

Then, the question is to what extent post-covid economic geography will change following the pandemic and because of the ongoing transformation. To what extent may marginal areas be part of an inclusive transition within the new globalization and digitalization challenges? A likely possibility is that, unless policy actions addressing the diffusion of knowledge and technology (and absorption capacity of firms and regions) are undertaken, the majority of the benefits stemming from digitalization and AI technologies are likely to concentrate spatially and across firms, as was the case before the pandemic. Remote working itself is going to stay, yet it alone will hardly bring radical transformations.

Given the above discussion, a "new normal" scenario may just entail a bounce back of the global economy, with a faster recovery in knowledge intensive regions that will benefit from the major innovations of the accelerated digital (and green) revolution, while other marginal areas will be following at a slower pace, if at all. Spatial hubs were the locations where COVID-19 cases clustered and diffused, due to their global linkages in terms of trade, flows of people and tourism, most notably in large and dense urban areas (OECD, 2021). But those hubs also have all the characteristics enabling recovery and resilience, including industrial diversification and higher degrees of related variety, as well as exposure to different types of proximity favouring knowledge spillovers and business dynamism. The exposure to international trade networks and GVCs, which acted as a diffusion driver for the pandemic during its early stages, are likely to constitute a resource in the long term for economic recovery. Regions characterized by related variety can transform their structure over time, navigating the "product space" by moving from one sector to another exploiting the opportunities provided by technological proximity and sufficient diversification of the economic structure (Hidalgo et al., 2007). Specialization in related variety favours learning, development, diffusion and adoption of new (and related) technologies (Boschma, 2005). A similar argument may apply to companies, as has been seen during previous crises. Firms better equipped in terms of knowledge base, innovation potential and integration in GVCs for

instance, may recover at a faster speed than others, in addition to considering the asymmetric impact of the pandemic across sectors.

Concerning work from home, it may increase the attractiveness of suburbs, but also of cities and regions outside of the main hubs. Such opportunities increase with the share of jobs that can be teleworked, meaning the impact is likely to be spatially uneven, benefitting the areas spatially closer to the hubs or, alternatively, areas with sufficient physical and digital infrastructure and reasonable connections to the core(s). Consequently, the attractiveness of peripheral areas for remote workers will depend on the public goods and services they can offer to individuals willing to relocate, including effective public transportation networks linking suburbs, minor cities and peripheral regions to the hubs. Such transportation may need to run at lower frequencies, being therefore more expensive to run and manage (Ramani and Bloom, 2021). Needless to say, remote working is not going to be the game changer opening new opportunities for the peripheries vis-à-vis the core. Furthermore, the strong path dependency shaping economic and innovation patterns and their spatial distribution will require proper policy interventions enabling "laggard" firms and territories to benefit from the ongoing transitions accelerated by the pandemic.

4. New policy paradigm, same old (lack of) impacts?

The global spread of COVID-19 has resulted in a significant disruption in economic activity, whose impact has been markedly different across different types of territories, sectors and firms, depending on structural characteristics, the degree of resilience and the cumulated disadvantages already characterizing their dynamism in competing in the global markets and taking growth opportunities. These factors have been studied extensively both from a firm and a territorial perspective and they have been recalled briefly previously in this chapter. Here their relevance for the policy response will be discussed.

In the occasion of the 2008 financial crisis and the following public debt crisis, austerity policies may have propelled a divergence among European countries and regions (Crescenzi et al. 2016). During the COVID-19 crisis a much more generalized consensus of supporting economies following a "whatever it takes" doctrine emerged. A wide range of policy tools for a multiplicity of different actors and mechanisms at the micro (firms) and at the meso (regions) level has been launched across the globe with the aim of fostering the recovery of a very fragile economic context.

National governments and international entities across the globe shared the urgency for a newly designed development policy scheme, characterized by the disbursement of unprecedent resources and with a large set of interventions taking place at the level of firms, regions, and cities (ESPON, 2022; Harasztosi et al. 2022). Policies with the objective of increasing resilience of firms and regions and promoting their recovery from the crisis have been launched across the globe with unprecedent resources. Richer countries used employment support measures more frequently together with direct forms of income transfers, i.e. wage subsidies and direct monetary transfers, while in low-income countries debt finance and tax interventions account for more than 58 percent of all measures (Cireira et al 2021). For almost all the most important response programs around the world, a massive allocation of resources was foreseen, with regions and firms being primary protagonists of the policy schemes.

In Europe, the financial disbursement at the European Union (EU) level has been very limited for decades, including in the aftermath the financial crisis, with a budget of 1% of the GDP of the member states. On 21 July 2020, as a result of lengthy negotiations, European leaders finally agreed on an ambitious, wide-ranging recovery package for the EU economy, boosting the EU budget with immediate effect. The recovery package leverages a common pool of financial resources, to be financed by borrowing funds from financial markets on behalf of the Union, known as Eurobonds. These resources will finance the EU's response to the social and

economic consequences of COVID-19 through the Next Generation EU (NGEU) package, with a total of 750 billion euros dedicated to supporting member states via new investments and reforms, kick-starting the EU economy by incentivizing private investment, and addressing the lessons learned from the crisis (European Commission, 2020a). Combined with the forthcoming 2021–2027 budget, NGEU will transfer more than 1.85 trillion euros to territories of the Union hit hardest by the pandemic (European Commission, 2020b). The first mobilization (around 672 billion euros) started on 1 January 2021 (European Commission, 2020c).

With NGEU, the EU aims at demonstrating its capacity to provide a swift and ambitious policy response to the crisis by financing urgent investments, creating jobs, and repairing the immediate damage caused by the pandemic, while also triggering a sustainable and resilient recovery. Indeed, NGEU investments must align with EU priorities of the green and digital transitions, which have been identified as central to Europe's future prosperity and resilience by the European Green Deal (European Commission, 2019; European Commission, 2020d) and in the 'Shaping Europe's digital future' plan (European Commission, 2020e). The "official" endorsement of the need to transform European economies leveraging digital tools, with the objective of a greener economy and society. is by itself a novelty with respect to the past, at least because of the relevance it is given in policy and public debates. The green and digital transitions are considered pivotal more than ever, beyond their potential for growth and job creation (Unsworth et al., 2020) and they constitute the main building blocks of the 'Recovery and Resilience Plans' put forward by member states. Furthermore, the new policy paradigm recognizes the need of just transition, acknowledging the social – but also economic and political – unsustainability of rising inequalities, in Europe and worldwide (Rodriguez-Pose, 2018; Martin, 2021). The implementation of NGEU, taking place at the member state level, will operationalize the climate, environmental, social, and digital priorities into concrete projects. Economic, social and territorial cohesion, and economic and social resilience are the building blocks of the policy packages supporting green and digital transitions out of the pandemic crisis, while also acting as mitigators of short-term impacts (European Commission, 2020f).

After decades of an overly centralized and sectoral logic that has led to a lack of clarity in thinking through place-based issues (McCann et al., 2021), the response of the United Kingdom has introduced (at least on paper) new attention to the role of the different territories in the recovery. The Levelling Up initiative launched by the government as a program of change that requires a fundamental shift in how central and local governments, the private sector and civil society operate. Physical, human, intangible, financial, social and institutional capital are identified as the dimensions to tackle in a renaissance perspective (UK Government, Department for Levelling Up, Housing & Communities, 2022).

In the United States (US), the federal government entitled a federal agency, the Economic Development Administration EDA), with the sole charge of promoting economic revitalization in communities of any scale, rural or urban, across the country. The EDA's role is seen as key if the US is to compete globally and prosper locally, spurring place-based regional economic development. Behind the initiative there is the awareness that not all regions are able to adapt and bounce back from economic disruptions, but only those with strong innovation, diverse industries, and civic capacities. In this context, the country's competitiveness depends on the capacities of firms and regions to innovate, prosper and become more economically resilient (Liu et al, 2022).

Recent literature acknowledges that policy support deployed during the pandemic has contributed massively to dampening the damaging impact of the crisis (Harasztosi, et al 2022). Government interventions, such as mitigation schemes, have positively affected the capability of small businesses to survive the pandemic increasing their average residual life (Belghitar et al 2022). In the first months of the crisis, small businesses in Germany (and many more besides) benefited from large and mainly horizontal aid measures, which may have created a backlog of non-performing activities and potential insolvencies (Dörr et al 2022). Government

support was crucial to (at least) partially shield small ventures particularly vulnerable to financial insolvency, to avoid the cascade effects observed during the financial crisis and avoid a sluggish recovery.

Alternatively, other papers conclude that the policy impact has been limited, especially for more vulnerable firms and countries, identifying mismatches between policies provided and policies most sought (Cireira et al 2021). In addition, they highlight that the policy toolkit that different governments provide depends on a huge variation in governments' administrative capabilities, fiscal space, the extent of informality, financial sector development and the reach of the tax system (Cireira et al 2021). The composition of the policy toolkit is critical, since different policies are associated with different impacts: according to Fernández-Cerezo et al (2021), public guaranteed loans were the policy measure deemed as more useful, followed by furlough schemes, tax deferrals and renegotiation of rental payments. Bayley et al (2021) stressed how in Europe "the support given by member state governments to the different economic sectors has tended to focus on large businesses (e.g., the airline sector) with less direct support for small and medium-sized enterprises (SMEs) and the self-employed" (p. 1958).

In such a context, what really matters is whether the unprecedent amount of resources disbursed under the new policy paradigm will be able to deliver long-term impacts that are inclusive (for all type of firms and regions) and timely (given the pressing need of the recovery and the strict timeline of the funded programs).

The timing of funding availability is a crucial factor during crises and governments may need to accept some inefficiency in funding allocation when this support is designed to avoid larger negative effects. As firms' responses to shock depend on their expectations, a good balance between swift responses to the crisis and clear plans of future government actions may help firms to make more informed decisions and avoid overreactions and potentially costly planning mistakes, while also safeguarding employment.

In this respect, the ability to transform policy aims in actionable policy sets coherent with firms and territories is going to be key, with the operational need to mitigate the shock (in the short run) and to improve their resilience (in the long run). The bridge between the design and implementation steps of the policies has the potential of undermining or consolidating the ambitious objectives and the financial effort characterizing the policy response to the COVID-19 crisis. A key role in this phase is played by the structure and the quality of the governance of the policy supply. Coordination between central and local authorities, administrative capacity and quality of institutions, allotment of responsibilities and civic participation are driving factors that are unfortunately heterogeneous and often weak across territories. With reference to the NGEU, Crescenzi et al (2021) identified those features that can shape – ceteris paribus – the implementation of the projects and, as a consequence, the extent of and the degree to which a policy can be transformed into actual operations and actions in the 'real' economy and thus produce its impacts. By analyzing a large sample of projects funded by the EU Cohesion Policy with the same priorities and objectives of NGEU, they found that, in order to be timely, the implementation of the NGEU projects within the EU Commission coordination framework need to be pursued with national governments liaising directly with their citizens through simplified participatory procedures involving relevant stakeholders.

When regional and local authorities are involved in the policy implementation, coordination between central and sub national authorities is key. Difficulties in this respect have been experienced since the very beginning of the policy response (lockdown management and distancing policies at first and vaccination campaigns later). According to Böhme et al (2020), the main common difficulty was to implement guidance from the central level, tailored to the context, with local and regional authorities and central authorities cooperating in a flexible and effective way, especially in healthcare and emergency funding. Looking at the case of Italy, Böhme et al (2020) also highlight that the regions decided to co-fund the national guarantee scheme (i.e. *Fondo Nazionale di Garanzia*), targeting enterprises to achieve the sufficient financial critical mass and facilitated business restarting by simplifying permits and concessions. According to them, the coordination between the regions and involved

institutional actors quickly enabled resources to be moved from the programs of the 2014-2020 EU Cohesion Policy towards the newly introduced Coronavirus Response Investment Initiatives. They argue that "a technical modus operandi was established between Managing Authorities of Regions and the Ministries, and at political level, within the State-Region Conference" (Böhme et al 2020, p. 49). The coordination within the governance of the policy responses to COVID-19 is key also according to Holtz et al (2020): they discuss the cost of uncoordinated policies, highlighting how "when people, ideas, and media move across borders contact patterns of people in a given region are significantly influenced by the policies and behaviors of people in other, sometimes distant, regions. The "loss from anarchy" in uncoordinated state policies is increasing in the number of noncooperating states and the size of social and geographic spillovers" (Holtz et al., 2020, p. 1). The uncoordinated response of countries to the crisis and the resulting tensions in how to deal with global crises may have instead more longstanding effects, and the new geopolitical tensions that have emerged with the war in Ukraine may indeed reinforce regional blocks in the upcoming years (Marvasi, 2022).

Coordination comes together with institutional quality and administrative capacity, that in this specific case are associated with readiness of effective policy responses: show how the different impact of public investment on growth over time is ascribed to changes in the quality of institutions. Similarly, Arbolino et al. (2019) suggest the short-term impacts of the European cohesion policy on regional economies were conditional on the heterogeneous quality of regional institutions.

The capacity of national and sub-national managing authorities to manage the funds and translate them into actionable projects will be key in a context of unprecedent resources to be spent in few years. With respect to existent EU policies with objectives and governance that are similar to the ones of NGEU, Becker et al (2013) have shown that impacts are conditioned on the capacity of regions to use the money available.

Finally, other determinants of local development and competitiveness remain key conditioning factors for the success of any policy that needs to account for their unequal distribution. Among them, social (civic) capital has been shown to be able to replace active distancing policies: Durante et al (2021) show that during the first waves of the pandemic, communities with high civic capital adopted social distancing even before they were required to do so, which contributed to early containment of the virus. They conclude that differences in civic culture can significantly impact the effectiveness of social distancing policies aimed at containing the propagation of the virus.

To be inclusive, the policy response should condition its success to the characteristics of firms and regions targeted by the policy. It has been shown that only European regions characterized by sufficiently supportive government institutions and higher human capital display a stronger capacity to absorb Cohesion Policy funds (Becker et al 2013; Accetturo et al 2014). The regional productive context (Bachtrögler et al 2017) and the sectoral structure of the local economy (Percoco 2017) as well as the macro-economic and institutional characteristics have been shown to determine the success or failure of the Cohesion Policy in the different member states (Crescenzi and Giua, 2020).

By focusing on the short run impacts, it has already been demonstrated that policies implemented in order to mitigate the impact of the shock i) have been more widely used by smaller and less productive firms, with a larger share of temporary workers, high debt levels and low cash buffers (Fernández-Cerezo et al 2021); ii) tilted towards firms already weak before the crisis, with firms that benefitted from the policy support tending to be more optimistic regarding their investment plans and impact, especially pronounced with regards to investment in digital technologies (Harasztosi et al 2022); iii) played a marginal role among most firms groups except in the dynamic resilient group as identified from World Bank Enterprise Survey data for firms in Central America (Olvera et al 2021).

Finally, the emerging trends documented in the previous sections of this chapter, in terms of re-organisation of GVCs and diffusion of new digital practices, call for new models of regional policy intervention that directly support the capability of less advanced regions to engage with the rapidly evolving patterns of globalisation and

technological change (Crescenzi and Harman 2023). Horizontal policies that reinforce fundamental regional assets and absorptive capacities remain central. However, they should be designed with a stronger orientation towards the needs and requirements of a changing global landscape. At the same time, a pro-active vertical engagement with global investment networks, trade and GVCs is increasingly more important with special reference to the digital and green transitions. "The potential for future technological turbulence – linked with the application of artificial intelligence and Industry 4.0 – further emphasizes the necessity to view GVC engagement through vertical engagement and horizontal readiness" (Crescenzi and Harman p.110). At the same time, the 'greening' of GVCs can offer relevant opportunities to support the green transition, in particular in less developed regions

General recommendations that can be drawn from evidence on past policy experience and from short term impacts of newly introduced policies are that: i) priority should be given to policies able to foster firms and regional dynamism and resilience; ii) sectors that are highly affected by the crisis and cities and regions where they are located need special attention but not through subsidies (people want jobs and tangible improvements); iii) inclusion needs to be fostered with active policy when implementing the twin transitions in order not to worsen the divide for disadvantaged regions, weak population groups such as immigrants and the elderly, low income workers and less competitive firms; iv) governance and institutions in practice need to be adequate for the challenging aims they face; v) the heterogeneous territorial impacts of the re-organisation of global value chains accelerated by the pandemic and the conflict in Ukraine need to be addressed through a new generation of GVC-sensitive local development policies that directly engage with changing pattern of global economic (dis)integration, especially to the benefit of less developed regions .

5. Summary

The COVID-19 pandemic and the health and economic crisis that followed represented an unprecedented exogenous shock for the world economic and societal equilibria. For its exogenous nature, the colossal magnitude of the consequences and their global scale, it has represented a unique testbed of rapid changes and a laboratory for policy responses.

At the moment, only speculative thoughts can be offered on the future of firms and regions in a new global equilibrium and more evidence is needed on the role of the policy response in the medium to long run.

The policy challenge is to strengthen recovery and resilience across types of firms and regions, *compensating* the weaknesses of peripheral regions and firms. Unprecedented resources have been devoted to this objective but the key to their success will rest upon the impact that they will be able to deliver once implemented. A rich evidence-base is available based on the experience of policies involving firms and regions in the past decades. The extensive literature looking at the impact achieved by Cohesion Policy, for instance, offers useful lessons on what determines the success or failure of policies involving firms and regions with the aim of fostering competitiveness and resilience.

Specific policy configurations capable to deliver successful policy responses can indeed be identified thanks to recent methodological improvements associated with the use of algorithms, data analytics, automation and machine learning. This body of evidence offers helpful guidance in order to identify the most successful approach in terms of actions, governance, beneficiaries, territories, modalities and management procedures. During the pandemic, all these digital opportunities have been strongly accelerated and implemented in the name of public health interventions (Dodds et al 2020, p. 295). These digital improvements might now be used in order to better target policies recipients and tools, enable impactful interventions, foster recovery and avoid further discontent among the poorest and most vulnerable populations.

The timing and the success that people, workers, firms and territories experience in facing the shock (short term) and managing the crisis (medium term) are enormously heterogeneous. In contrast to the shock, this heterogeneity is far from being exogenous: it reflects (and often magnifies) the multiplicity of long-term strengths and weaknesses fostering or hampering development and competitiveness over the past decades. The impact of these heterogenous pre-existing conditions does not end with the shock itself. Conversely, they will hamper (or foster) resistance to the shock (and recovery in the longer term) as well as the capacity to 'learn lessons' and mitigate risks from future shocks (i.e. building resilience). As a result, when working to minimize the impact of future shocks, national governments and international organizations should address the fundamental weaknesses of the contextual local scenario where shocks will inevitably continue to unfold. By addressing deep-rooted factors of disadvantage, public policies can creative more favorable conditions in order to deal with long-term change (e.g. economic integration and technological changes) as well as political and environmental risks and shocks.

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