OECD Global Forum on Productivity & Trento Spatial Productivity Lab

Workshop on

Spatial Dimensions of Productivity

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SUMMARY REPORT

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GLOBAL FORUM ON PRODUCTIVITY

OECD BETTER POLICIES FOR BETTER LIVES

Productivity is the main determinant of living standards

Economies that are more productive generate greater ability to support and enhance wellbeing of their citizens via higher incomes, better infrastructure, more services and improved sustainability of welfare systems. OECD countries have been confronted with decreasing and persistently low aggregate productivity growth, declining business dynamism and job reallocation rates, and increasing regional productivity disparities. To what extent are these trends related? What can policy do to revert them?

Empirical analysis shows that effective governance arrangements, international and regional openness and connectedness, development and fast diffusion of innovative technologies and best practices -- including in the provision of public services and deployment of smart infrastructure -- and the efficient allocation of skilled and creative workers across the national territory can enhance productivity growth of regions and nations. The importance of efficiently allocating natural, human and technological resources, however, highlights the significance of the spatial dimension in the productivity agenda as synergies between knowledge, skills, technologies and agglomeration factors need to be leveraged upon in order to boost the contribution of local efficiency improvements to overall productivity growth, also by finding tailored solutions for specific places. The spatial dimensions of productivity are becoming increasingly more important as global megatrends, such as globalisation, digitalisation and ageing, affect localities differently along the urban-rural continuum.

Opening remarks

In his opening remarks**, Arno Kompatscher**, the president of the Autonomous Province of Bolzano, Italy, welcomed all participants and offered background information on the Province. Mr. Kompatscher highlighted the heterogeneity of productivity performance across Italian regions. He noted that the productivity discourse and productivity policy in the country are at the national level. The national approach does not allow to discern the reasons for the inter-regional differences and to provide help where it is needed. It also masks elements that lead to successful performance depriving policy-makers of the ability to replicate mechanisms that work. Mr. Kompatscher stressed the need for the analysis and research at the subnational level to better inform policy design.

Ottavio Ricchi, Head of Unit, Economic and Financial Analysis and Planning Directorate, Ministry of Economy and Finances, Italy, **continued the opening panel**. He introduced the Ministry's actions and goals to promote productivity agenda. Like the previous speaker, Mr. Ricchi emphasised the relevance of microeconomic evidence for understanding productivity heterogeneity pointing out that many productivity determinants, such as public services, technology infrastructure and idiosyncratic factors at firm-level among others, are always local.

Joaquim Oliveira Martins, Deputy Director, Centre for Entrepreneurship, SMEs, Regions and Cities, OECD **finished the opening session**. He drew attention of the participants to the fact that the Workshop in Bolzano was the first time for the GFP to tackle the subnational dimension. He again underscored the disconnect between the national and regional productivity discourse (and productivity policies) noting an important shift from national compensatory mechanisms to multilevel governance. Mr. Oliveira Martins listed a range of issues from technology adoption by SMEs to training to public service provision that the national governments are unlikely to tackle efficiently. Local efforts are central to the ability of places to capitalise on many new opportunities, such as integration into GVCs, introduction of the 5G technology, training for digitalisation and others. All these, and many other important issues, need to be linked in a regional perspective, he concluded.

Session 1 "Mobility within and across regions: Misallocation or growth potential?" **was chaired by Flavia Terribile** of the Presidency of Italy's Council of Ministers and the Chair of the OECD Territorial Development Policy Committee. In her remarks, Ms. Terribile drew everybody's attention to the importance of reducing interregional inequality, which leads to social discontent. The global trends will have a strong impact on communities but places are different and this may deepen inequalities. It is important to reverse negative trends in productivity and human capital accumulation in many lagging places, which would require programming of a new structural plan and investments crucial to boosting productivity and resilience. In Ms. Terribile's view, this is a matter of infrastructure design and management, not resources. And here regions are important partners of national governments. The OECD regions already manage 57% of public investment. They are better positioned to develop integrated strategies for local conditions in many areas including transportation, education and others.

In the first presentation, **Douglas Sutherland** and **Fozan Fareed** (both at OECD) explored the role of state-level occupational licensing in the slowdown of productivity growth (roughly approximated by earnings) and job mobility in the U.S. The authors relied on the job-to-job (J2J) flow data from the U.S. Census Bureau for job mobility measures and workers' characteristics and the CareerOneStop data for state licencing. The data allowed plotting patterns of the variables of interest across various demographic, industry- and firm-level characteristics, which can be used to better understand the dynamics of job reallocations. In the empirical part of the analysis, a regression approach revealed that greater state-level occupational licensing is indeed related to lower mobility and lower earnings growth.

Claire Lelarge (RITM Université Paris-Sud, Paris, France) explored the effects of high-speed rail (HSR) infrastructure in France on productivity and organisation of firms. A better transport infrastructure and connectivity may mitigate moral hazard problems and increase returns to functional specialisation. Using data on all French firms except for financial services, the authors documented increases in operating profit margins and labour productivity caused by variation in travel time reduction as a result of the expanding HSR system. These impacts were likely driven by multi-plant companies reorganising in response to changes in connectivity (by moving managers to central offices) and by the increase in functional specialisation, which led to the adjustments in the size of branches. The research showed one of the mechanisms of geographical job polarisation and high-skill job concentration in largest cities such as Paris.

In the last presentation of the session, **Alexander Lembcke** (OECD) presented new data and analyses on the economic effects of roads and market access. The authors focused specifically on improvements in accessibility within cities and across cities and regions, which was approximated by travel time-weighted access to markets. The results of empirical estimation suggested that 1% greater accessibility leads to 0.2% higher GDP; 0.7% higher employment and 0.6% higher regional population. These percentage gains were not statistically different for rural, intermediate and urban regions but the estimated impact varied across Europe. Increased accessibility was found to stimulate employment and population in the Southern European regions; GDP in the Eastern European regions and all three outcomes in other regions. Alexander emphasised that the gains were finite – even if accessibility were to increase to the maximum possible level given the existing road network, the GDP would be expected to increase by 17% to 26% depending on the macro-region.

Session 2 "Infrastructure in a digital and globalised world: What's required to bridge regional divides?"

was chaired by **Alessandra Proto**, Acting Head of the OECD Trento Centre for Local Development.

In the first presentation, **Jonathan Timmis** (University of Nottingham, UK) talked about his research on cloud computing and firm growth, where he highlighted a fundamental shift in how more and more, especially young, firms access ICT: not by buying hardware and software themselves – which involves a lot of sunk costs – but renting computing and data capacity online, on the cloud. This allows a more "pay-as-you-go" approach, with potentially greater flexibility, scalability and less reliance on central IT departments. His study used detailed geographical information on the location of plants and their distance to high-speed (fibre) internet distribution centres as an instrument for cloud usage to ensure that it was not endogenous to firm performance. It found that young (less than 5 year old) firms that used cloud services grew in size and to some extent also increased productivity (sales per worker). In contrast, older businesses did not grow as much but reorganised themselves to become geographically more dispersed across their plants. Importantly, plants without fibre access tended to close down, pointing to the crucial role for policy in achieving high coverage across all localities. Overall, the aggregate implications were found to be limited, pointing to the need for further complementary reorganisation to achieve larger economy wide benefits from this technology. The results also provided a cautionary sign for policies supporting traditional ICT infrastructure, given that utilising the cloud could be a more attractive solution for more resource-constrained businesses. The discussion focused on the role of spillover effects – to which Jonathan saw limited evidence in their work – and on the price of the cloud services and the concern that there could be risks to monopolistic tendencies in that market.

Clément Mazet-Sonilhac (Banque de France) presented his work on the role of broadband expansion in France across different localities as a catalyst for greater involvement in international trade for the affected firms, based on the idea that Internet reduces the search costs associated with finding new trade partners. He presented robust evidence that firms with broadband access increased their imports substantially, mostly through importing from new source countries (mainly China and Eastern Europe) and new types of products, but not by expanding the existing trade channels. The impacts are bigger on capital goods than on intermediary or consumption goods, while they are also positive on firm value added. Overall, this indicates that productivity is likely to be positively affected. Interestingly, as also discussed by the audience, the export effects were found to be much smaller, which was explained by the fact that the search costs of international trade were usually paid by the importer and not the exporter. Using a calibrated micro-founded theoretical model, the presenter also predicted price reductions and a rise in consumer welfare of the introduction of broadband internet access through the trade-expansion channel.

Session 3 “The use of geospatial data for productivity analysis”

was chaired by **Rudiger Ahrend**, Head of Economic Analysis, Statistics and Multi-level Governance Section at the OECD Centre for Entrepreneurship, SMEs, Regions and Cities.

The first presentation by **Ana Moreno Monroy** (OECD) stressed the importance of a global definition of cities and their areas of influence. Her work was motivated by the substantial discrepancies between cities and their administrative boundaries (especially evident in Paris or Rome), which prevented spatial productivity comparisons across different countries. To overcome this, the OECD proposed a new definition of Functional Urban Areas (FUAs), which defined a city as a densely inhabited urban centre, a commuting zone as a surrounding area of influence linked to the city by commuting flows, whereas the spatial aggregation of the city and its commuting zone constitutes a functional urban area. The above model was validated empirically on a global scale showing excellent predictive capacity and robustness to country-specific characteristics or the application of alternative proxies. Finally, the model was applied to study the population dynamics within the FUAs. The results suggested that in the developed countries more people live in commuting zones compared to cities. This is particularly evident in the U.S., which has the largest share of commuting zone population.

Carlo Lavalle (Joint Research Service, European Commission) proceeded with an overview of the emerging geospatial data sources and suggested a range of innovative empirical applications. He argued in favour of two main sources for geospatial data, those generated as a by-product of web activity (content or traffic of webpages and web searches), statistics on social media (tweets, check – ins and photos) or online financial transactions (internet payment processes) and those generated by the ICT-based services, sensors and satellited such as navigation and mapping data (road networks) and counts of vehicles or pedestrians. Such data exhibit great potential to facilitate a wide range of human or societal changes. In particular, the presentation highlighted how geospatial data promoted *land use characterisation* by locating industrial, commercial and service clusters and *walkability* by identifying clusters of mixed services as elements of walkable neighbourhoods. Similarly, geospatial data were particularly useful to illustrate housing market policies and trends, touristic flows and spatiotemporal population trends. Finally, Carlo underscored the role of new data in territorial modelling, as a complement to improve the accuracy of current statistical data, evaluating the attractiveness and suitability for investments and to perform ad-hoc spatial analyses (i.e. spillover effects).

In the third presentation of the session, **Alexander Himbert** (OECD) focused on the impact of trade on the development of border regions, which are less likely to reap the benefits of trade liberalization and tend to be less developed compared to other parts of their countries. Alexander showed that the level of economic activity, measured by the data on night lights, increased with the distance from the national borders. This was true for both developed and developing countries as well as for urban and rural areas. Focusing on the effects of bilateral trade on firm-level performance in border regions, the presentation concluded that exports generated more employment at the border than in the interior local economies. Importantly, the above effect held for both productivity and employment in all economic sectors. In contrast, imports had a smaller productivity and employment effect, which in the manufacturing sector was found to be negative with the border regions incurring the heaviest losses. In concluding his talk, Alexander highlighted the potential of international trade to increase the productivity of firms especially in border regions.

All three presentations were followed by lively discussions with the participants who were interested in both technical details of building quality datasets based on geospatial data or innovative definitions of the urban space and the potential insights for relevant policy action.

Session 4 "Promoting innovation and productivity diffusion: Skills and innovation and regional and local eco-systems" was chaired by **Peter Berkowitz**, Head of Unit, Smart and Sustainable Growth, DG REGIO, European Commission.

Philip McCann (University of Sheffield, UK) was motivated by his experience at the UK Productivity Insights Network to, rather than talking about what we do know, emphasize what we do not yet know about on the link between cities, regions and productivity. In a thorough critique, he confronted some `textbook assumptions' with a wealth of data. Larger cities are assumed to be more productive, more resilient and to drive economic growth – yet in many countries a large number of cities are less productive and exhibit lower productivity growth than the average, non-urban region - while some cities are engines of growth, some are a drag. Urban economic models assume growing population and land prices – yet between one quarter and one third of European cities are facing population decline – as a consequence we know very little about how to manage `decline'. Transport and infrastructure are assumed to drive productivity growth – yet the evidence is inconclusive and varies across countries – our understanding of what makes infrastructure projects successful in promoting productivity growth is still limited. Many more assumptions were scrutinized by Philip. Overall, his discussion called the general applicability of the narrative of the `Triumph of the city' into question, especially for European countries, and emphasized the urgency for more analyses with new data for policy makers to better understand why some cities succeed while others do not. In the ensuing discussion, McCann and the audience shared their optimism that further analysis, bringing together researchers from various disciplines, collecting and exploring new data, offers great scope for gaining a better understanding of how to devise effective, place-based policies.

Mercedes Teruel (Universitat Rovira y Virgili, Barcelona, Spain) talked about what we know about knowledge diffusion and innovation in regional and local eco-systems and the particular experience for Catalonia. The process of knowledge diffusion and innovation takes place in an economic environment where firms and individuals (different in terms of skills, knowledge, innovation and absorptive capacity) share information and form networks in geographically concentrated areas, which are not uniformly distributed at the regional level and even local levels. The challenge for policy-makers is to bring together individuals and strategic actors within municipalities and across regions, e.g. via inter-city networks, science parks, or by offering co-working spaces, while retaining talent in laggard regions, to help trigger the development of eco-systems that facilitate the sharing of knowledge and innovation.

Alessandra Faggian (Gran Sasso Science Institute, Italy) presented her work on the importance of external knowledge sources for innovation of rural and urban establishments in the U.S. Using cross-sectional data for U.S. establishments from the 2014 Rural Establishment Innovation Survey, Alessandra and her co-author confirmed the importance of outside knowledge sources for the innovative activities of both urban and rural firms. In particular, their analysis suggests that external knowledge sourcing promotes product, process, and green innovation. The positive effect of the knowledge sourcing from the extra-industry organisations on own innovative performance is the greatest for rural firms and plays a limited role in innovation of urban companies.

Session 5 "National and local sector efficiency: Implications for productivity" was chaired by **Alessandra Faggian**, Professor of Applied Economics, Director of Social Sciences and Vice Provost for Research at the Gran Sasso Science Institute in L'Aquila, Italy.

Mauro Pisu (OECD) presented work on the effect of public administration efficiency on firm-level productivity in Italy. He and his colleagues used a geographical discontinuity design to analyse the productivity effects of provincial public administrative efficiency. The analyses focused on firms located in the same economic areas but in municipalities belonging to different provinces. This makes companies in the sample subjects to different public administrations. The results revealed the positive productivity effects from public administration efficiency, which were particularly strong for smaller and older firms.

The presentation by **Guido de Blasio** (Bank of Italy) also focused on Italy. It evaluated the Italian local public service provision incentive program *Obiettivi di Servizio.* The program monitored progress in four local public policy areas through outcome-based indicators and used financial incentives to reward positive outcomes. The program ran in the administrations of the regions of Southern Italy from 2007 until 2013. While the program did have some positive effects on the outcome-based indicators, it led to displacement across local public service provision; the municipalities that were part of the incentive program performed worse in the public sector areas that were not part of the program. In addition, Guido questioned the efficiency of the program design. The targets were defined in terms of absolute targets, not progress, thereby making some targets impossible to reach for certain municipalities or too easy to reach for other municipalities.

Stephen Aldridge (Ministry of Housing, Communities and Local Government, UK) provided some practical and theoretical structure to the concept of public sector efficiency by differentiating between technical efficiency and allocative efficiency and discussing the drivers and importance of public sector efficiency. Based on data from the UK, Stephen showed that public sector productivity had grown at slower rates than private sector productivity over the longer term. However, it had been growing faster than private sector productivity since 2010. Analysis showed that relatively less efficient local authorities tended to be least resilient in terms of financial sustainability. Lastly, Stephen briefly discussed a few case studies that illustrate the attempts by the UK government to promote public sector efficiency and listed future steps to attain this goal.

Concluding remarks

In his concluding remarks, **Giuseppe Nicoletti (OECD)** thanked everyone for their participation and summarized the three main takeaways from the workshop.

First, place and space matter for productivity. Several presentations provided evidence that place-based policies are critical for aggregate performance. Differences across regions in occupational licensing can affect the reallocation and thus knowledge transfer across space. The provision of transport or technological infrastructure, for instance of access to broadband fibre or high-speed trains, allows firms to adopt new technologies and efficiency-enhancing organizational change, or integrate into the global market. At the same time, these policies can have complex effects on the distribution of jobs and economic activity between the periphery and urban centres.

Second, there is still much to learn. The presentations at the workshop also challenged established knowledge, and demonstrated that we still need to gain a better understanding of how local conditions interact with place-based policies. We learned more about what we still need to understand better. Why, for instance, do some cities prosper and benefit from agglomeration effects while others shrink and have low productivity? A wealth of new, granular data is becoming available that may help finding answers to these questions. For instance, future work may explore the spatial dimensions of productivity in more depth to understand the mechanisms of spillovers, or how local conditions affect the efficiency of reallocation and of matching workers with firms.

Third, collaboration is the key. To get access to the data needed for a better understanding of the mechanisms and effects of place-based policies and spatial factors of productivity, economists and statistical offices need to work together to address the confidentiality issues and make these data available to researchers. Collaboration is also required across central and local levels of government. As the effectiveness of national policies depends crucially on local conditions, the successful implementation of policies must incentivize local actors and take account of political economy factors.

All presentations are available at https://oe.cd/GFPBolzano2019

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