Lockdown shows us it is not work that attracts us to big cities – but the social life

The world is currently experiencing the largest pandemic since the Spanish flu one century ago. According to the Coronavirus Research Center at Johns Hopkins University, more than 50 million people have been infected by the virus globally as of mid-November 2020 and about 1.3 million died. To contain the spread of the virus, governments have implemented surveillance, quarantine and social-distancing measures. These threaten to erode the comparative advantages of big cities that arise from economic and social interaction. This has led to many distinguished thinkers expressing their diverse views on how the pandemic might shape the future of cities. In a recent blog, Max Nathan and Henry Overman, provide an excellent summary of the public debate on whether and why there might be a ”big city exodus”.

We add to this debate taking a slightly different angle. Since it is ultimately hard to know how large and persistent the effect of the pandemic will be, we consider the following thought experiment: What would happen if all positive effects of agglomeration on productivity (e.g. knowledge diffusion, labour market pooling, vertical linkages) and amenities (e.g. access to restaurants, clubs, theatres) would disappear?

The intuition is strong. People will no longer want to pay high rents in big cities if they do not get agglomeration-induced higher wages and quality of life in return. They will leave big cities and move to smaller cities (or rural areas) so that rents will fall until, eventually, a new equilibrium is reached. The challenging part is to quantify the magnitude of these effects. How many people will have to leave to restore the equilibrium in big cities? Where will they go? Could rents even go up in places that have become relatively more popular? At the end of the day, one city’s population loss is another city’s population gain in a system of cities.

Answering these questions requires a structural general equilibrium model of the spatial economy. Our brand-new dynamic spatial model (Ahlfeldt, Bald, Roth, Seidel, 2020) is well suited for the tasks because it features labour-market-related agglomeration (higher wages) and housing-market-related congestion forces (higher rents), costly migration (that can depend on geographic, cultural, or social distance) and idiosyncratic locational preferences. Unlike in a conventional spatial equilibrium model where identical workers are perfectly mobile, some people are more attached to certain types of cities than others in our model. This is important because, realistically, not everyone will leave big cities immediately, even if wages drop, quality of life objectively falls, and rents remain high. All structural parameters and fundamentals of the model have been estimated or inverted using a large data set covering 30 million workers and 20 million housing transactions in Germany.

To speak to our thought experiment, we use the model to compute three counterfactual scenarios:

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1. a) We eliminate positive density effects on productivity that arise from economic interaction;
2. b) We eliminate positive density effects on quality of life that arise from social interaction;
3. c) The combination of a) and b).

The model delivers predictions for 18 groups defined by age, gender, and skill in 141 German local labour markets (LLMs). To simplify the discussion, we aggregate the effects to two types of labour markets, which we distinguish by whether they have a working population of more (30 LLMs) or less (111 LLMs) than 250,000

Productivity effect

In the model, the agglomeration effect on productivity is moderated by 18 group-specific parameters that establish a positive relationship between density and productivity (density elasticities). For the counterfactual, we set them all to zero. The result is that more populated LLMs lose 8.8% of their population to the smaller LLMs, whose population increases by 9.5%. GDP declines by 16% (large LLMs) and 2.4%. GDP shrinks in the small LLMs despite an increase in population because even small LLMs experience a significant loss of productivity. The lower wage bill results in lower house prices due to a reduction in housing demand in both types of LLMs, but the effect is naturally larger in the large LLMs (-0.4%).

Quality-of-life effect

Intuitively, a LLM that attracts many workers even though wages are low and rents are high must have a high quality of life according to our model. For our counterfactual exercise, we need to relate a model-based measure of quality of life to some measure of opportunities for social interactions that LLMs offer. We argue that geo-tagged photos shared on social media form a useful big data index since pictures are often taken at places of social interaction (e.g. in a pub or an art gallery). So, we first establish the (conditional) correlation between the big data index and quality of life in our model. We then lower the big data index to the lowest level observed across all LLMs to obtain quality of life in a low-social-interactions scenario.

Since large cities offering particularly vibrant cultural, gastronomic, and nightlife amenities, it is no surprise that the quality of life shock hits the larger LLM harder. Actually, the quality of life effect is much greater than the productivity effect which reflects that big cities are – or used to be – attractive places to live in. The model predicts that population and GDP drop by approximately 40% in large LLMs. This is mirrored by a 50%-increase in small LLMs. This shift in demand causes rents to rise by 6.7% in small LLMs and fall by 9.3% in large LLMs.

Productivity and quality-of-life effects combined

Naturally, the effects tend to increase if we combine the shocks to productivity and quality-of-life. Large LLMs lose 40% of their population and 45% of their GDP. Population and GDP increase by 50% and 38% in the smaller LLMs. The effect on rent is perhaps more interesting as the productivity and quality-of-life effects work in opposite directions for smaller LLMs. The net effect is a 5.1% increase in rent. What sounds like good news for landlords, is, of course, bad news for renters. For the large LLMs, lower demand results in plummeting rents (-11%).

Summing up

Eliminating the benefits of social and economic interaction would result in negative effects on big and small cities, but the effects on big cities would be much larger according to our model. Yet the effects on big cities are not nearly as devastating as in a conventional spatial model with perfect mobility. If we increase mobility threefold by assuming away many of the idiosyncratic reasons that tie people to particular cities, we would see nearly twice as many workers relocating from large to small LLMs. Another important takeaway is that the quality-of-life effect that a permanent reduction in social interaction could have is potentially very large, particularly in big cities. While understanding how the pandemic has transformed our working lives is important, the effect on the quality of life of city dwellers is equivalently relevant. Unlike the canonical neoclassical framework, a new class of spatial models with imperfect mobility is well suited to study the quality of life effects of spatial shocks.

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Finally, we wish to highlight that neither us nor our model can predict the future. What we have discussed is an unrealistic fictional scenario in which all spatial spillovers disappeared forever. Even in this unlikely scenario, our model predicts that it would take decades to complete just half of the transition to the new equilibrium. Most importantly, there is hope that behavioural adjustments and technological innovations (cheaper and quicker tests and effective vaccines) will mitigate the long-run impact. Hence, it seems very likely that big cities will stick around for a while.

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Notes:

- *This blog post is based on Quality of Life in a Dynamic Spatial Model, Discussion Paper 1736 of LSE's Centre for Economic Performance (CEP), December 2020.*
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Gabriel Ahlfeldt is a professor of urban economics and land development at LSE's department of geography and environment, and a researcher at LSE's Centre for Economic Performance (CEP). He is the director of the MSc in real estate economics and finance.

Fabian Bald is a PhD student in economics at the Mercator School of Management (University Duisburg-Essen, Germany) and the Ruhr Graduate School in Economics.

Duncan Roth is a senior researcher at the Institute for Employment Research (IAB).

Tobias Seidel is a professor of economics at the Mercator School of Management (University of Duisburg-Essen, Germany).

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